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ICT Information and Communications Technology

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INDUSTRY SKILLS COUNCILS
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ICT Information and Communications Technology

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ICT10115 Certificate I in Information, Digital Media and Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for individuals to safely perform foundation digital literacy tasks using a personal computer and a range of software applications and digital devices.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 6
4 core units plus
2 elective units

The elective units consist of:

- up to 2 from the elective units listed below
- up to 1 from elsewhere in the ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate I or II level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT101 Operate a personal computer
ICTICT102 Operate word-processing applications
ICTICT103 Use, communicate and search securely on the internet
ICTICT104 Use digital devices

Elective units

BSBWHS201 Contribute to health and safety of self and others
BSBSUS201 Participate in environmentally sustainable work practices
BSBCMM101 Apply basic communication skills
ICTICT105 Operate spreadsheet applications
ICTICT106 Operate presentation packages
ICTICT107 Use personal productivity tools
ICTICT108 Use digital literacy skills to access the internet

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT10115 Certificate I in Information, Digital Media and Technology	ICA10111 Certificate I in Information, Digital Media and Technology	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT20115 Certificate II in Information, Digital Media and Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This entry level qualification provides the foundation skills and knowledge to use information and communications technology (ICT) in any industry.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 14
7 core units plus
7 elective units

The elective units consist of:

- up to 7 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate II or III level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS201 Contribute to health and safety of self and others
BSBSUS201 Participate in environmentally sustainable work practices
ICTICT201 Use computer operating systems and hardware
ICTICT202 Work and communicate effectively in an ICT environment
ICTICT203 Operate application software packages
ICTICT204 Operate a digital media technology package
ICTWEB201 Use social media tools for collaboration and engagement

Elective units

CUFCAM201A Assist with a basic camera shoot
CUFDIG201A Maintain interactive content
CUFDIG303A Produce and prepare photo images
CUFPOS201A Perform basic vision and sound editing
CUFSOU204A Perform basic sound editing
ICTICT205 Design basic organisational documents using computing packages
ICTICT206 Install software applications
ICTICT207 Integrate commercial computing packages
ICTICT208 Operate accounting applications
ICTICT209 Interact with ICT clients
ICTICT210 Operate database applications
ICTICT211 Identify and use basic current industry specific technologies
ICTICT212 Incorporate Indigenous needs and perspectives into ICT environment
ICTSAS201 Maintain inventories for equipment, software and documentation
ICTSAS202 Apply problem-solving techniques to routine ICT malfunctions
ICTSAS203 Connect hardware peripherals
ICTSAS204 Record client support requirements
ICTSAS205 Maintain ICT system integrity
ICTSAS206 Detect and protect from spam and destructive software
ICTSAS207 Protect and secure information assets
ICTSAS208 Maintain ICT equipment and consumables

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ICTSAS209 Connect and use a home based local wireless network
ICPDMT321 Capture a digital image

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT20115 Certificate II in Information, Digital Media and Technology	ICA20111 Certificate II in Information, Digital Media and Technology	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT30115 Certificate III in Information, Digital Media and Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in a wide range of general information and communications technology (ICT) technical functions and to achieve a degree of self-sufficiency as an advanced ICT user.

Persons working at this level will support information technology activities in the workplace across a wide range of ICT areas, including technical support, network administration, web technologies, software applications and digital media technologies.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 17
6 core units plus
11 elective units

The elective units consist of:

- 5 units from one of the following specialist elective groups:
  - Group A Applications
  - Group B Network administration
  - Group C Support
  - Group D Web technologies
  - Group E Multimedia
- up to 6 from any of the specialist elective groups below or from Group F general elective units below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate III or IV level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT202 Work and communicate effectively in an ICT environment
ICTICT301 Create user documentation
ICTICT302 Install and optimise operating system software
ICTSAS301 Run standard diagnostic tests

Elective units

Specialist elective units

Group A Applications

ICTICT203 Operate application software packages
ICTICT304 Implement system software changes
ICTICT307 Customise packaged software applications for clients
ICTICT308 Use advanced features of computer applications
ICTICT409 Develop macros and templates for clients using standard products

Group B Network administration

ICTNWK301 Provide network systems administration
ICTNWK302 Determine and action network problems

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ICTNWK304 Administer network peripherals
ICTNWK305 Install and manage network protocols
ICTSAS307 Install, configure and secure a small office or home office network

Group C Support

ICTICT303 Connect internal hardware components
ICTSAS303 Care for computer hardware
ICTSAS304 Provide basic system administration
ICTSAS305 Provide ICT advice to clients
ICTSAS306 Maintain equipment and software

Group D Web technologies

BSBEBU401 Review and maintain a website
ICTWEB201 Use social media tools for collaboration and engagement
ICTWEB301 Create a simple markup language document
ICTWEB302 Build simple websites using commercial programs
ICTWEB303 Produce digital images for the web

Group E Multimedia

CUFANM301A Create 2D digital animations
CUFANM302A Create 3D digital animations
ICTGAM301 Apply simple modelling techniques
ICTGAM302 Design and apply simple textures to digital art
ICTGAM303 Review and apply the principles of animation

General elective units

Group F

BSBIPR301 Comply with organisational requirements for protection and use of intellectual property
CUFDIG301A Prepare video assets
CUFDIG302A Author interactive sequences
CUFDIG304A Create visual design components
ICTICT305 Identify and use current industry specific technologies
ICTICT306 Migrate to new technology
ICTNWK303 Configure and administer a network operating system
ICTNWK306 Evaluate characteristics of cloud computing solutions and services
ICTNWK419 Identify and use current virtualisation technologies
ICPDMT346 Incorporate video into multimedia presentations
ICTPRG301 Apply introductory programming techniques
ICTCBL2065B Splice and terminate optical fibre cable for carriers and service providers
ICTCBL2136B Install, maintain and modify customer premises communications cabling: ACMA Restricted Rule

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ICTCBL2137B Install, maintain and modify customer premises communications cabling: ACMA Open Rule
ICTCBL2139B Apply safe technical work practices for cabling registration when configuring ADSL circuits
ICTBWN3082B Perform tests on optical communication system and components
ICTBWN3088B Install optical fibre splitters in fibre distribution hubs
ICTBWN3090B Install lead-in module and cable for fibre to the premises
ICTBWN3100B* Work safely with live fibre to test and commission a fibre to the x installation
ICTWHS2170B Follow work health and safety environmental policy and procedures

** Note the following prerequisite unit requirements:*

Unit in this qualification	**Prerequisite unit**
ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation	ICTWHS2170B Follow work health and safety environmental policy and procedures

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT30115 Certificate III in Information, Digital Media and Technology	ICA30111 Certificate III in Information, Digital Media and Technology	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT40115 Certificate IV in Information Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in a wide range of general information and communications technology (ICT) technologies and to support small to medium enterprises (SMEs) that require broader rather than more specialised ICT support.

Persons working at this level apply a wide range of knowledge and skills in basic networking, ICT support, database development, programming and web development support; working safely and ethically in a sustainable work environment.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
5 core units plus
15 elective units

The elective units consist of:

- up to 15 from the specialist elective groups below, with a maximum of 5 units from any one group:
  - Group A Networking
  - Group B Programming
  - Group C IT support
  - Group D Web design and development
  - Group E Digital games
  - Group F Digital media technologies
  - Group G Project management
- up to 5 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT202 Work and communicate effectively in an ICT environment
ICTICT401 Determine and confirm client business requirements
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment

Elective units

Specialist elective units

Group A Networking

ICTICT423 Select cloud storage strategies
ICTNWK401 Install and manage a server
ICTNWK402 Install and configure virtual machines for sustainable ICT
ICTNWK403 Manage network and data integrity
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK405 Build a small wireless local area network
ICTNWK406 Install, configure and test network security
ICTNWK407 Install and configure client-server applications and services
ICTNWK408 Configure a desktop environment

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ICTNWK409 Create scripts for networking
ICTNWK410 Install hardware to a network
ICTNWK411 Deploy software to networked computers
ICTNWK412 Create network documentation
ICTNWK414 Create a common gateway interface script
ICTNWK416 Build security into virtual private networks
ICTNWK417 Build an enterprise wireless network
ICTNWK418 Implement backbone technologies in a local area network
ICTNWK419 Identify and use current virtualisation technologies
ICTSAS307 Install, configure and secure a small office or home office network

Group B Programming

ICTICT410 Conduct post-implementation ICT system reviews
ICTICT420 Develop client user interface
ICTPRG401 Maintain open-source code programs
ICTPRG402 Apply query language
ICTPRG403 Develop data-driven applications
ICTPRG404 Test applications
ICTPRG405 Automate processes
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG407 Write script for software applications
ICTPRG409 Develop mobile applications
ICTPRG410 Build a user interface
ICTPRG412 Configure and maintain databases
ICTPRG413 Use a library or pre-existing components
ICTPRG414 Apply introductory programming skills in another language
ICTPRG415 Apply skills in object-oriented design
ICTPRG416 Manage a software component reuse library
ICTPRG417 Apply mathematical techniques for software development
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG419 Analyse software requirements
ICTPRG425 Use structured query language
ICTPRG426 Prepare software development review
ICTPRG427 Use XML effectively
ICTPRG428 Use regular expressions in programming languages

Group C ICT support

ICTDBS403 Create basic databases
ICTDBS407 Monitor physical database implementation
ICTDBS408 Link an RFID system to a database
ICTDBS503 Create a data warehouse
ICTICT402 Determine project specifications and secure client agreement
ICTICT403 Apply software development methodologies
ICTICT404 Use online learning tools
ICTICT405 Develop detailed technical design
ICTICT406 Build a graphical user interface

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ICTICT408 Create technical documentation
ICTICT411 Select and employ software and hardware testing tools
ICTICT412 Coordinate and maintain ICT work teams
ICTICT413 Relate to clients on a business level
ICTICT415 Provide one-to-one instruction
ICTICT416 Contribute to the development of strategic plans
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTSAD401 Develop and present feasibility reports
ICTSAS402 Implement configuration management strategies
ICTSAS403 Review site environmental factors prior to ICT system implementation
ICTSAS404 Acquire ICT system components
ICTSAS405 Identify and evaluate ICT industry vendor technologies
ICTSAS407 Conduct pre-installation audit for software installation
ICTSAS408 Complete data transition in data migration process
ICTSAS409 Manage risks involving ICT systems and technology
ICTSAS410 Identify and resolve client ICT problems
ICTSAS411 Assist with policy development for client support procedures
ICTSAS412 Action change requests
ICTSAS413 Manage resolution of system faults on a live system
ICTSAS414 Evaluate system status
ICTSAS415 Optimise ICT system performance
ICTSAS416 Implement maintenance procedures
ICTSAS417 Undertake ICT system capacity planning
ICTSAS418 Monitor and administer security of an ICT system
ICTSAS419 Support system software
ICTSAS420 Provide first-level remote help-desk support
ICTSAS421 Support users and troubleshoot desktop applications
ICTSAS424 Support different operating systems

Group D Web design and development

ICTICT407 Maintain website information standards
ICTWEB401 Design a website to meet technical requirements
ICTWEB402 Confirm accessibility of websites for people with special needs
ICTWEB403 Transfer content to a website using commercial packages
ICTWEB404 Maintain website performance
ICTWEB405 Monitor traffic and compile website traffic reports
ICTWEB406 Create website testing procedures
ICTWEB407 Conduct operational acceptance tests of websites
ICTWEB408 Ensure basic website security
ICTWEB409 Develop cascading style sheets
ICTWEB410 Apply web authoring tool to convert client data for websites
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB412 Produce interactive web animation
ICTWEB413 Optimise search engines
ICTWEB414 Design simple web page layouts
ICTWEB415 Produce server-side script for dynamic web pages

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ICTWEB416 Customise content management system
ICTWEB417 Integrate social web technologies
ICTWEB418 Use development software and ICT tools to build a basic website
ICTWEB419 Develop guidelines for uploading information to a website
ICTWEB420 Write content for web pages
ICTWEB421 Ensure website content meets technical protocols and standards
ICTWEB422 Ensure website access and useability
ICTWEB423 Ensure dynamic website security
ICTWEB424 Evaluate and select a web hosting service
ICTWEB425 Apply structured query language to extract and manipulate data
ICTWEB429 Create a markup language document to specification

Group E Digital games

ICTGAM401 Produce an interactive game
ICTGAM402 Identify and apply principles of games design and game playing
ICTGAM403 Create design documents for interactive games
ICTGAM405 Write story and content for digital games
ICTGAM406 Create visual design components for interactive games
ICTGAM407 Write scripts for interactive games
ICTGAM408 Use 3-D animation interface and toolsets
ICTGAM409 Create 3-D characters for interactive games
ICTGAM410 Develop 3-D components for interactive games
ICTGAM412 Design interactive media
ICTGAM413 Design and create 3-D digital models
ICTGAM414 Create audio for digital games
ICTGAM415 Develop simple environments for 3-D games
ICTGAM416 Prepare and complete image rendering processes
ICTGAM417 Apply digital effects to interactive products
ICTICT419 Work effectively in the digital media industry

Group F Digital media technologies

BSBCRT401 Articulate, present and debate ideas
CUFANM301A Create 2D digital animations
CUFANM302A Create 3D digital animations
CUFANM402A Create digital visual effects
CUFDIG401A Author interactive media
CUFPPM404A Create storyboards
CUFSOU204A Perform basic sound editing
CUFSOU301A Prepare audio assets
ICTDMT401 Create visual design components for digital media
ICTDMT402 Produce interactive animation
ICTDMT403 Produce and edit digital images

Group G Project management

ICTPMG401 Support small scale ICT projects

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT40115 Certificate IV in Information Technology	ICA40111 Certificate IV in Information Technology	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT40215 Certificate IV in Information Technology Support

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in supporting clients in a range of technical areas. The qualification has a strong information technology base of core units with the potential for inclusion of a range of broader industry-specific units in the areas of service desk, database, sustainability and network support to suit particular needs.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 22
8 core units plus
14 elective units

The elective units consist of:

- 5 from one of the following specialist elective groups:
  - Group A Database support
  - Group B Network communications
  - Group C Service desk
  - Group D Sustainability.

Of the remaining elective units:

- up to 9 may be from the specialist elective groups below or from Group E general elective units below
- up to 4 may be from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS403 Contribute to implementing and maintaining WHS consultation and participation processes
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT401 Determine and confirm client business requirements
ICTICT408 Create technical documentation
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTSAS307 Install, configure and secure a small office or home office network
ICTSAS410 Identify and resolve client ICT problems
ICTSAS412 Action change requests

Elective units

Specialist elective units

Group A Database support

ICTDBS402 Complete database backup and restore
ICTDBS404 Identify and resolve common database performance problems
ICTDBS409 Monitor and administer a database

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ICTDBS412 Build a database
ICTPRG425 Use structured query language

Group B Network communications

ICTNWK401 Install and manage a server
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK405 Build a small wireless local area network
ICTNWK406 Install, configure and test network security
ICTNWK408 Configure a desktop environment

Group C Service desk

ICTICT421 Connect, maintain and configure hardware components
ICTSAS414 Evaluate system status
ICTSAS421 Support users and troubleshoot desktop applications
ICTSAS425 Configure and troubleshoot operating system software
ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults

Group D Sustainability

BSBSUS501 Develop workplace policy and procedures for sustainability
ICTSUS4183A Install and test renewable energy system for ICT networks
ICTSUS4184A Install and test power saving hardware
ICTSUS4185A Install and test power management software
ICTSUS4186A Install thin client applications for power over ethernet

General elective units

Group E

BSBCRT401 Articulate, present and debate ideas
ICTDBS401 Identify physical database requirements
ICTDBS403 Create basic databases
ICTICT413 Relate to clients on a business level
ICTICT415 Provide one-to-one instruction
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTICT422 Participate in ICT services
ICTICT423 Select cloud storage strategies
ICTNWK409 Create scripts for networking
ICTNWK410 Install hardware to a network
ICTNWK411 Deploy software to networked computers
ICTNWK419 Identify and use current virtualisation technologies
ICTPMG401 Support small scale ICT projects
ICTPRG405 Automate processes
ICTSAD401 Develop and present feasibility reports
ICTSAS411 Assist with policy development for client support procedures

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ICTSAS413 Manage resolution of system faults on a live system
ICTSAS416 Implement maintenance procedures
ICTSAS420 Provide first-level remote help-desk support
ICTSAS424 Support different operating systems
ICTSAS518 Install and upgrade operating systems
ICTWEB415 Produce server-side script for dynamic web pages
ICTCBL2136B Install, maintain and modify customer premises communications cabling: ACMA Restricted Rule
ICTCBL2137B Install, maintain and modify customer premises communications cabling: ACMA Open Rule
ICTCBL2139B Apply safe technical work practices for cabling registration when configuring ADSL circuits
ICTOPN4116A Use advanced optical test equipment
ICTTEN4199A Install, configure and test a router

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT40215 Certificate IV in Information Technology Support	ICA40211 Certificate IV in Information Technology Support	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT40315 Certificate IV in Web-Based Technologies

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides an individual with the skills and knowledge to design, develop, build and administer websites using a range of website technologies.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 22
8 core units plus
14 elective units

The elective units consist of:

- 5 from one of the following specialist groups:
  - Group A Administration
  - Group B Design and development.

Of the remaining elective units:

- up to 9 may be from the specialist elective groups below or from Group C general elective units below
- up to 4 may be from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
ICTICT401 Determine and confirm client business requirements
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTWEB401 Design a website to meet technical requirements
ICTWEB402 Confirm accessibility of websites for people with special needs
ICTWEB403 Transfer content to a website using commercial packages
ICTWEB424 Evaluate and select a web hosting service
ICTWEB429 Create a markup language document to specification

Elective units

Specialist elective units

Group A Administration

ICTWEB404 Maintain website performance
ICTWEB405 Monitor traffic and compile website traffic reports
ICTWEB406 Create website testing procedures
ICTWEB407 Conduct operational acceptance tests of websites
ICTWEB408 Ensure basic website security

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Group B Design and development

ICTDBS403 Create basic databases
ICTWEB409 Develop cascading style sheets
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB415 Produce server-side script for dynamic web pages
ICTWEB425 Apply structured query language to extract and manipulate data

General elective units

Group C

BSBCRT401 Articulate, present and debate ideas
BSBSUS301 Implement and monitor environmentally sustainable work practices
CUFPPM404A Create storyboards
ICTICT403 Apply software development methodologies
ICTICT407 Maintain website information standards
ICTICT408 Create technical documentation
ICTICT417 Identify, evaluate and apply current industry-specific technologies to meet industry standards
ICTICT420 Develop client user interface
ICTNWK409 Create scripts for networking
ICTPMG401 Support small scale ICT projects
ICTPRG405 Automate processes
ICTWEB410 Apply web authoring tool to convert client data for websites
ICTWEB412 Produce interactive web animation
ICTWEB413 Optimise search engines
ICTWEB414 Design simple web page layouts
ICTWEB416 Customise content management system
ICTWEB417 Integrate social web technologies
ICTWEB421 Ensure website content meets technical protocols and standards

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT40315 Certificate IV in Web-Based Technologies	ICA40311 Certificate IV in Web-Based Technologies	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT40415 Certificate IV in Information Technology Networking

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to install and manage small scale networks, either as an independent network support technician or as part of a team.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 17
8 core units plus
9 elective units

The elective units consist of:

- up to 9 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
ICTICT401 Determine and confirm client business requirements
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTNWK401 Install and manage a server
ICTNWK402 Install and configure virtual machines for sustainable ICT
ICTNWK403 Manage network and data integrity
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTTEN4198A Install, configure and test an internet protocol network

Elective units

BSBCRT401 Articulate, present and debate ideas
BSBWOR404 Develop work priorities
ICTICT403 Apply software development methodologies
ICTICT408 Create technical documentation
ICTICT417 Identify, evaluate and apply current industry-specific technologies to meet industry standards
ICTICT423 Select cloud storage strategies
ICTNWK405 Build a small wireless local area network
ICTNWK406 Install, configure and test network security
ICTNWK407 Install and configure client-server applications and services
ICTNWK408 Configure a desktop environment
ICTNWK409 Create scripts for networking
ICTNWK410 Install hardware to a network
ICTNWK411 Deploy software to networked computers
ICTNWK412 Create network documentation
ICTNWK419 Identify and use current virtualisation technologies
ICTPMG401 Support small scale ICT projects
ICTPRG425 Use structured query language
ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults

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ICTOPN4116A Use advanced optical test equipment
ICTSUS4183A Install and test renewable energy system for ICT networks
ICTSUS4184A Install and test power saving hardware
ICTSUS4185A Install and test power management software
ICTSUS4186A Install thin client applications for power over ethernet
ICTTEN4199A Install, configure and test a router
ICTTEN4202A Install and test a radio frequency identification system
ICTTEN4210A Implement and troubleshoot enterprise routers and switches
ICTTEN4211A Design, install and configure an internetwork
ICTTEN5200A Install, configure and test a local area network switch

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT40415 Certificate IV in Information Technology Networking	ICA40411 Certificate IV in Information Technology Networking	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT40515 Certificate IV in Programming

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to develop basic programming skills in the most commonly used programming languages.

An individual with this qualification could work as an assistant programmer in a team of software developers, or as a support programmer to senior programmers or systems analysts.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 18
10 core units plus
8 elective units

The elective units consist of:

- up to 8 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTPRG402 Apply query language
ICTPRG403 Develop data-driven applications
ICTPRG404 Test applications
ICTPRG405 Automate processes
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG410 Build a user interface
ICTPRG414 Apply introductory programming skills in another language
ICTPRG415 Apply skills in object-oriented design
ICTPRG419 Analyse software requirements

Elective units

BSBCRT401 Articulate, present and debate ideas
BSBWHS304 Participate effectively in WHS communication and consultation processes
ICTDBS403 Create basic databases
ICTICT404 Use online learning tools
ICTICT408 Create technical documentation
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTICT420 Develop client user interface
ICTPMG401 Support small scale ICT projects
ICTPRG401 Maintain open-source code programs
ICTPRG407 Write script for software applications
ICTPRG409 Develop mobile applications
ICTPRG412 Configure and maintain databases
ICTPRG413 Use a library or pre-existing components
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG427 Use XML effectively
ICTPRG428 Use regular expressions in programming languages

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ICTPRG527 Apply intermediate object-oriented language skills
ICTSAD401 Develop and present feasibility reports
ICTSAD501 Model data objects
ICTSAD502 Model data processes

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT40515 Certificate IV in Programming	ICA40511 Certificate IV in Programming	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT40615 Certificate IV in Information Technology Testing

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in a range of information and communications technology (ICT) positions directly related to testing, either as an assistant tester, working mostly independently or as part of a team.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
8 core units plus
12 elective units

The elective units consist of:

- up to 12 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT401 Determine and confirm client business requirements
ICTICT408 Create technical documentation
ICTICT411 Select and employ software and hardware testing tools
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTPMG401 Support small scale ICT projects
ICTPRG405 Automate processes
ICTSAS301 Run standard diagnostic tests

Elective units

BSBCRT401 Articulate, present and debate ideas
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTNWK403 Manage network and data integrity
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK501 Plan, implement and test enterprise communication solutions
ICTPRG404 Test applications
ICTSAS401 Perform unit test for a class
ICTSAS503 Perform systems tests
ICTSAS504 Develop and conduct client acceptance test
ICTSAS513 Develop detailed test plans
ICTSAS514 Perform integration tests
ICTSAS515 Manage the testing process
ICTSAS516 Perform stress and load tests on integrated platforms
ICTWEB406 Create website testing procedures
ICTWEB407 Conduct operational acceptance tests of websites
ICTWEB423 Ensure dynamic website security
ICTSUS4183A Install and test renewable energy system for ICT networks
ICTTEN4198A Install, configure and test an internet protocol network

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT40615 Certificate IV in Information Technology Testing	ICA40611 Certificate IV in Information Technology Testing	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT40715 Certificate IV in Systems Analysis and Design

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to work as part of a project team to analyse and redesign existing systems to meet client business requirements.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 22
7 core units plus
15 elective units

The elective units consist of:

- up to 15 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT401 Determine and confirm client business requirements
ICTICT403 Apply software development methodologies
ICTICT405 Develop detailed technical design
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTPRG405 Automate processes
ICTSAD401 Develop and present feasibility reports

Elective units

BSBCRT401 Articulate, present and debate ideas
BSBWOR301 Organise personal work priorities and development
ICTDBS401 Identify physical database requirements
ICTDBS412 Build a database
ICTICT402 Determine project specifications and secure client agreement
ICTICT408 Create technical documentation
ICTICT411 Select and employ software and hardware testing tools
ICTICT412 Coordinate and maintain ICT work teams
ICTICT413 Relate to clients on a business level
ICTICT416 Contribute to the development of strategic plans
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTPMG401 Support small scale ICT projects
ICTPRG404 Test applications
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG414 Apply introductory programming skills in another language
ICTPRG415 Apply skills in object-oriented design
ICTPRG419 Analyse software requirements
ICTPRG425 Use structured query language
ICTTEN4081A Locate, diagnose and rectify faults

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Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT40715 Certificate IV in Systems Analysis and Design	ICA40711 Certificate IV in Systems Analysis and Design	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT40815 Certificate IV in Digital Media Technologies

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent to design, develop and use digital media technologies as an assistant information and communications technology (ICT) specialist working independently or as part of a larger development team

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 17
7 core units plus
10 elective units

The elective units consist of:

- 5 units from one of the following specialist groups:
  - Group A Web development
  - Group B Programming
  - Group C Interactive media.

Of the remaining elective units:

- up to 5 may be from the specialist elective groups below or from Group D general elective units below or elsewhere in ICT Information and Communications Technology Training Package
- up to 3 may be from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBCRT401 Articulate, present and debate ideas
BSBWHS304 Participate effectively in WHS communication and consultation processes
CUFDIG401A Author interactive media
ICTICT404 Use online learning tools
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT419 Work effectively in the digital media industry
ICTPMG401 Support small scale ICT projects

Specialist elective units

Group A Web development

ICTWEB301 Create a simple markup language document
ICTWEB402 Confirm accessibility of websites for people with special needs
ICTWEB406 Create website testing procedures
ICTWEB407 Conduct operational acceptance tests of websites
ICTWEB409 Develop cascading style sheets
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB412 Produce interactive web animation

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ICTWEB414 Design simple web page layouts
ICTWEB415 Produce server-side script for dynamic web pages
ICTWEB421 Ensure website content meets technical protocols and standards
ICTWEB425 Apply structured query language to extract and manipulate data

Group B Programming

ICTPRG301 Apply introductory programming techniques
ICTPRG402 Apply query language
ICTPRG405 Automate processes
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG407 Write script for software applications
ICTPRG412 Configure and maintain databases
ICTPRG414 Apply introductory programming skills in another language

Group C Interactive media

CUFANM301A Create 2D digital animations
CUFANM302A Create 3D digital animations
CUFANM402A Create digital visual effects
CUFCAM301A Shoot material for screen productions
CUFPOS401A Edit screen content for fast turnaround
CUFPOS402A Manage media assets
CUFPPM404A Create storyboards
CUFSOU204A Perform basic sound editing
CUFSOU301A Prepare audio assets
ICTDMT401 Create visual design components for digital media
ICTDMT402 Produce interactive animation
ICTDMT403 Produce and edit digital images
ICTGAM401 Produce an interactive game
ICTGAM403 Create design documents for interactive games
ICTGAM405 Write story and content for digital games
ICTGAM413 Design and create 3-D digital models

General elective units

Group D

ICTICT408 Create technical documentation
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTDBS412 Build a database

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT40815 Certificate IV in Digital Media Technologies	ICA40811 Certificate IV in Digital Media Technologies	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
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ICT40915 Certificate IV in Digital and Interactive Games

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in supporting the design, development and programming of basic digital games briefs as part of a larger development team. The qualification has a small suite of core units with an opportunity to select units from specialist groups of electives across the different artistic or programming fields of the industry.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 16
4 core units plus
12 elective units

The elective units consist of:

- 5 units from one of the following specialist elective groups:
  - Group A Design
  - Group B Programming
  - Group C Art.

Of the remaining elective units:

- up to 7 may be from the specialist elective groups below or from Group D general elective units below or elsewhere in ICT Information and Communications Technology Training Package
- up to 3 may be from elsewhere in ICT Information and Communications Technology Training Package or from any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
ICTGAM401 Produce an interactive game
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT419 Work effectively in the digital media industry

Elective units

Specialist elective units

Group A Design

CUFPPM404A Create storyboards
ICTGAM402 Identify and apply principles of games design and game playing
ICTGAM403 Create design documents for interactive games
ICTGAM405 Write story and content for digital games
ICTGAM406 Create visual design components for interactive games
ICTGAM407 Write scripts for interactive games

Group B Programming

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ICTGAM404 Apply artificial intelligence in game development
ICTICT406 Build a graphical user interface
ICTPRG301 Apply introductory programming techniques
ICTPRG405 Automate processes
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG413 Use a library or pre-existing components
ICTPRG415 Apply skills in object-oriented design
ICTPRG417 Apply mathematical techniques for software development
ICTPRG527 Apply intermediate object-oriented language skills

Group C Art

CUFANM301A Create 2D digital animations
CUFANM302A Create 3D digital animations
CUFANM303A Create 3D digital models
CUFANM402A Create digital visual effects
CUVDRA201A Develop drawing skills
ICTDMT402 Produce interactive animation
ICTDMT403 Produce and edit digital images
ICTGAM301 Apply simple modelling techniques
ICTGAM302 Design and apply simple textures to digital art
ICTGAM303 Review and apply the principles of animation
ICTGAM408 Use 3-D animation interface and toolsets
ICTGAM409 Create 3-D characters for interactive games
ICTGAM410 Develop 3-D components for interactive games
ICTGAM412 Design interactive media
ICTGAM413 Design and create 3-D digital models
ICTGAM414 Create audio for digital games
ICTGAM416 Prepare and complete image rendering processes
ICTGAM417 Apply digital effects to interactive products
ICTGAM418 Use simple modelling for animation

General elective units

Group D

BSBCRT401 Articulate, present and debate ideas
ICTICT408 Create technical documentation
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTICT420 Develop client user interface

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Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT40915 Certificate IV in Digital and Interactive Games	ICA40911 Certificate IV in Digital and Interactive Games	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
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ICT41015 Certificate IV in Computer Systems Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to install and administer simple networks, servers, and client desktop deployments either as an independent information and communications technology (ICT) specialist or as part of a team.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
12 core units plus
8 elective units

The elective units consist of:

- up to 8 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Certificate IV or Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS304 Participate effectively in WHS communication and consultation processes
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTICT401 Determine and confirm client business requirements
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT421 Connect, maintain and configure hardware components
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK405 Build a small wireless local area network
ICTPRG414 Apply introductory programming skills in another language
ICTSAS425 Configure and troubleshoot operating system software
ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTTEN4199A Install, configure and test a router

Elective units

BSBCRT401 Articulate, present and debate ideas
ICTICT405 Develop detailed technical design
ICTICT408 Create technical documentation
ICTICT412 Coordinate and maintain ICT work teams
ICTICT415 Provide one-to-one instruction
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards
ICTICT423 Select cloud storage strategies
ICTNWK401 Install and manage a server
ICTNWK402 Install and configure virtual machines for sustainable ICT
ICTNWK403 Manage network and data integrity
ICTNWK407 Install and configure client-server applications and services
ICTNWK408 Configure a desktop environment
ICTNWK419 Identify and use current virtualisation technologies
ICTNWK507 Install, operate and troubleshoot medium enterprise routers

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ICTPMG401 Support small scale ICT projects
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG409 Develop mobile applications
ICTSAS307 Install, configure and secure a small office or home office network
ICTSAS420 Provide first-level remote help-desk support
ICTWEB414 Design simple web page layouts
ICTWEB415 Produce server-side script for dynamic web pages
ICTWEB425 Apply structured query language to extract and manipulate data
ICTWEB429 Create a markup language document to specification
ICTTEN2140B Use hand and power tools
ICTTEN4198A Install, configure and test an internet protocol network

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT41015 Certificate IV in Computer Systems Technology	ICA41011 Certificate IV in Computer Systems Technology	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT50115 Diploma of Information Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to administer and manage information and communications technology (ICT) support in small-to-medium enterprises (SMEs) using a wide range of general ICT technologies.

Persons working at this level provide a broader rather than specialised ICT support function, applying a wide range of higher level technical skills in ICT areas such as networking, IT support, database development, programming and web development.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
4 core units plus
16 elective units

The elective units consist of:

- up to 16 units from the specialist elective groups below, with a maximum of 5 units from any one group:
  - Group A Networking
  - Group B Programming
  - Group C IT support
  - Group D Web design and development
  - Group E Digital games
  - Group F Digital media technologies
  - Group G Project management
- up to 5 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS501 Ensure a safe workplace
BSBSUS501 Develop workplace policy and procedures for sustainability
ICTICT509 Gather data to identify business requirements
ICTICT511 Match ICT needs with the strategic direction of the enterprise

Specialist elective units

Group A Networking

ICTNWK501 Plan, implement and test enterprise communication solutions
ICTNWK502 Implement secure encryption technologies
ICTNWK503 Install and maintain valid authentication processes
ICTNWK504 Design and implement an integrated server solution
ICTNWK505 Design, build and test a network server
ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network
ICTNWK507 Install, operate and troubleshoot medium enterprise routers
ICTNWK508 Install, operate and troubleshoot medium enterprise switches
ICTNWK509 Design and implement a security perimeter for ICT networks
ICTNWK510 Develop, implement and evaluate system and application security
ICTNWK511 Manage network security

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ICTNWK513 Manage system security
ICTNWK514 Model preferred system solutions
ICTNWK515 Develop configuration management protocols
ICTNWK516 Determine best-fit topology for a local network
ICTNWK517 Determine best-fit topology for a wide area network
ICTNWK518 Design an enterprise wireless local area network
ICTNWK519 Design an ICT security framework
ICTNWK520 Design ICT system security controls
ICTNWK521 Install, configure and test a payment gateway
ICTNWK522 Build decks using wireless markup language
ICTNWK524 Install and configure network access storage devices
ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK529 Install and manage complex ICT networks
ICTNWK531 Configure an internet gateway
ICTNWK532 Identify and resolve network problems
ICTNWK533 Configure and manage advanced virtual computing environments
ICTNWK534 Monitor and troubleshoot virtual computing environments
ICTNWK535 Install an enterprise virtual computing environment
ICTNWK614 Manage ICT security
ICTNWK615 Design and configure desktop virtualisation

Group B Programming

ICTPRG501 Apply advanced object-oriented language skills
ICTPRG502 Manage a project using software management tools
ICTPRG503 Debug and monitor applications
ICTPRG504 Deploy an application to a production environment
ICTPRG505 Build advanced user interface
ICTPRG506 Design application architecture
ICTPRG507 Implement security for applications
ICTPRG508 Create mashups
ICTPRG509 Build using rapid application development
ICTPRG510 Maintain custom software
ICTPRG511 Monitor and support data conversion to new ICT system
ICTPRG512 Prepare for the build phase of an ICT system
ICTPRG513 Coordinate the build phase of an ICT system
ICTPRG514 Prepare for software development using rapid application development
ICTPRG515 Review developed software
ICTPRG516 Develop integration blueprint for ICT systems
ICTPRG517 Install, test and evaluate pilot version of ICT system
ICTPRG518 Monitor the system pilot
ICTPRG523 Apply advanced programming skills in another language
ICTPRG524 Develop high-level object-oriented class specifications
ICTPRG525 Build Java applets
ICTPRG526 Maintain functionality of legacy code programs
ICTPRG527 Apply intermediate object-oriented language skills
ICTPRG528 Perform ICT data conversion

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ICTPRG601 Develop advanced mobile multi-touch applications
ICTSAD501 Model data objects
ICTSAD502 Model data processes
ICTSAD503 Minimise risk of new technologies to business solutions

Group C IT Support

ICTICT501 Research and review hardware technology options for organisations
ICTICT502 Develop detailed component specifications from project specifications
ICTICT503 Validate quality and completeness of system design specifications
ICTICT504 Confirm transition strategy for a new system
ICTICT506 Implement process re-engineering strategies
ICTICT507 Select new technology models for business
ICTICT510 Determine appropriate ICT strategies and solutions
ICTICT512 Plan process re-engineering strategies for business
ICTICT514 Identify and manage the implementation of current industry-specific technologies
ICTICT515 Verify client business requirements
ICTSAD506 Produce a feasibility report
ICTSAS501 Develop, implement and evaluate an incident response plan
ICTSAS502 Establish and maintain client user liaison
ICTSAS503 Perform systems tests
ICTSAS504 Develop and conduct client acceptance test
ICTSAS505 Review and update disaster recovery and contingency plans
ICTSAS506 Update ICT system operational procedures
ICTSAS507 Implement and evaluate systems for regulatory and standards compliance
ICTSAS509 Provide client ICT support services
ICTSAS510 Review and develop ICT maintenance strategy
ICTSAS511 Prioritise ICT change requests
ICTSAS512 Review and manage delivery of maintenance services
ICTSAS513 Develop detailed test plans
ICTSAS515 Manage the testing process
ICTSAS517 Use network tools
ICTSAS518 Install and upgrade operating systems

Group D Web design and development

ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB429 Create a markup language document to specification
ICTWEB501 Build a dynamic website
ICTWEB502 Create dynamic web pages
ICTWEB503 Create web-based programs
ICTWEB504 Build a document using eXtensible markup language
ICTWEB505 Develop complex web page layouts
ICTWEB506 Develop complex cascading style sheets
ICTWEB507 Customise a complex ICT content management system
ICTWEB508 Develop website information architecture
ICTWEB509 Use site server tools for transaction management
ICTWEB510 Analyse information and assign meta tags

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ICTWEB511 Implement quality assurance process for websites
ICTWEB512 Administer business websites and servers
ICTWEB515 Implement and use web services
ICTWEB516 Research and apply emerging web technology trends

Group E Digital games

ICTGAM501 Create design concepts for digital games and 3-D media
ICTGAM503 Create a complex 3-D interactive computer game
ICTGAM504 Manage interactive media production
ICTGAM506 Create complex code for mobile game devices
ICTGAM507 Develop intermediate 3-D software for games and interactive media
ICTGAM508 Develop complex 3-D software for games and interactive media
ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling
ICTGAM510 Prepare games for different platforms and delivery modes
ICTGAM511 Manage testing of games and interactive media
ICTGAM512 Create and implement designs for a 3-D games environment
ICTGAM514 Design and create models for a 3-D and digital effects environment
ICTGAM515 Design and create advanced particles, fluids and bodies for 3-D digital effects
ICTGAM516 Animate a 3-D character for digital games
ICTGAM517 Produce a digital animation sequence
ICTGAM518 Animate physical attributes of models and elements
ICTGAM519 Manage technical art and rigging in 3-D animation
ICTGAM520 Create and combine 3-D digital games and components
ICTGAM521 Create interactive 3-D environments for digital games
ICTGAM522 Complete digital editing for the 3-D and digital effects environment
ICTGAM523 Collaborate in the design of 3-D game levels and environments
ICTGAM524 Integrate multiple data sources into interactive 3-D environments
ICTGAM525 Apply digital texturing for the 3-D environment in digital games
ICTGAM526 Create complex 3-D characters for games
ICTGAM527 Integrate database with online game
ICTGAM529 Analyse business opportunities in the digital games environment

Group F Digital media technologies

BSBCRT501 Originate and develop concepts
CUFDIG502A Design web environments
CUFDIG503A Design e-learning resources
CUFDIG507A Design digital simulations
CUFPOS201A Perform basic vision and sound editing
CUFPOS401A Edit screen content for fast turnaround
CUSSOU302A Record and mix a basic music demo
CUSSOU502A Produce sound recordings
CUVPHI519A Investigate and exploit innovative imaging options
ICTDMT501 Incorporate and edit digital video
ICTICT406 Build a graphical user interface
ICTICT419 Work effectively in the digital media industry

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Group G Project management

ICTPMG501 Manage ICT projects

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT50115 Diploma of Information Technology	ICA50111 Diploma of Information Technology	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT50215 Diploma of Digital and Interactive Games

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in a variety of skill areas within the digital and interactive games industry. It provides an opportunity to develop the design, graphic/digital media and programming skills required in the development of digital games briefs, either as a small independent specialist or as part of a larger team. The qualification also provides opportunities to work in new and emerging games genres, such as online game development, mobile device gaming, interactive internet and TV game development.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 16
5 core units plus
11 elective units

The elective units consist of:

- 5 from one of the following specialist groups
  - Group A Programming
  - Group B Art
  - Group C Digital media.

Of the remaining elective units:

- up to 6 may be from the specialist elective groups below or from Group D general elective units below
- up to 3 may be from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS403 Contribute to implementing and maintaining WHS consultation and participation processes
ICTGAM501 Create design concepts for digital games and 3-D media
ICTGAM503 Create a complex 3-D interactive computer game
ICTGAM523 Collaborate in the design of 3-D game levels and environments
ICTICT419 Work effectively in the digital media industry

Elective units

Specialist elective units

Group A Programming

ICTGAM419 Build a database to support a computer game
ICTGAM506 Create complex code for mobile game devices
ICTGAM507 Develop intermediate 3-D software for games and interactive media
ICTGAM508 Develop complex 3-D software for games and interactive media
ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling
ICTGAM510 Prepare games for different platforms and delivery modes
ICTGAM511 Manage testing of games and interactive media

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ICTGAM527 Integrate database with online game
ICTPRG425 Use structured query language
ICTPRG501 Apply advanced object-oriented language skills
ICTPRG515 Review developed software
ICTPRG523 Apply advanced programming skills in another language
ICTWEB508 Develop website information architecture

Group B Art

ICTGAM512 Create and implement designs for a 3-D games environment
ICTGAM514 Design and create models for a 3-D and digital effects environment
ICTGAM515 Design and create advanced particles, fluids and bodies for 3-D digital effects
ICTGAM516 Animate a 3-D character for digital games
ICTGAM517 Produce a digital animation sequence
ICTGAM518 Animate physical attributes of models and elements
ICTGAM519 Manage technical art and rigging in 3-D animation
ICTGAM520 Create and combine 3-D digital games and components
ICTGAM526 Create complex 3-D characters for games

Group C Digital media

CUFDIG502A Design web environments
CUFDIG503A Design e-learning resources
CUFDIG507A Design digital simulations
CUSSOU403A Perform advanced sound editing
ICTGAM521 Create interactive 3-D environments for digital games
ICTGAM522 Complete digital editing for the 3-D and digital effects environment
ICTGAM524 Integrate multiple data sources into interactive 3-D environments
ICTGAM525 Apply digital texturing for the 3-D environment in digital games

General elective units

Group D

BSBCRT501 Originate and develop concepts
BSBSUS501 Develop workplace policy and procedures for sustainability
ICTGAM504 Manage interactive media production
ICTGAM528 Create games for mobile devices
ICTGAM529 Analyse business opportunities in the digital games environment
ICTGAM530 Develop and implement physics in a 3-D digital game
ICTGAM531 Complete compositing to create elements for the 3-D and digital effects environment
ICTICT408 Create technical documentation
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTPMG501 Manage ICT projects
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB429 Create a markup language document to specification

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50215 Diploma of Digital and Interactive Games	ICA50211 Diploma of Digital and Interactive Games	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
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ICT50315 Diploma of Information Technology Systems Administration

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in administering a variety of networked computer systems. The qualification has a strong information technology base of core units with the potential for inclusion of a range of broader industry-specific units in the areas of virtualisation, sustainability and project management to suit particular needs.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 19
10 core units plus
9 elective units

The elective units consist of:

- up to 9 elective units from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package
- or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBSUS501 Develop workplace policy and procedures for sustainability
ICTICT418 Contribute to copyright, ethics and privacy in an IT environment
ICTICT509 Gather data to identify business requirements
ICTNWK513 Manage system security
ICTSAS406 Implement and hand over system components
ICTSAS502 Establish and maintain client user liaison
ICTSAS505 Review and update disaster recovery and contingency plans
ICTSAS512 Review and manage delivery of maintenance services
ICTSAS515 Manage the testing process
ICTTEN5204A Produce technical solutions from business specifications

Elective units

ICTICT501 Research and review hardware technology options for organisations
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTICT515 Verify client business requirements
ICTNWK501 Plan, implement and test enterprise communication solutions
ICTNWK502 Implement secure encryption technologies
ICTNWK504 Design and implement an integrated server solution
ICTNWK505 Design, build and test a network server
ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network
ICTNWK509 Design and implement a security perimeter for ICT networks
ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK529 Install and manage complex ICT networks
ICTNWK531 Configure an internet gateway
ICTNWK533 Configure and manage advanced virtual computing environments

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ICTNWK534 Monitor and troubleshoot virtual computing environments
ICTNWK535 Install an enterprise virtual computing environment
ICTNWK615 Design and configure desktop virtualisation
ICTPMG501 Manage ICT projects
ICTSAD506 Produce a feasibility report
ICTSAS503 Perform systems tests
ICTSAS513 Develop detailed test plans
ICTSAS517 Use network tools
ICTSAS518 Install and upgrade operating systems
ICTSUS5187A Implement server virtualisation for a sustainable ICT system
ICTSUS6233A Integrate sustainability in ICT planning and design projects
ICTSUS6234A Establish a business case for sustainability and competitive advantage in ICT projects
ICTTEN6206A Produce an ICT network architecture design

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50315 Diploma of Information Technology Systems Administration	ICA50311 Diploma of Information Technology Systems Administration	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT50415 Diploma of Information Technology Networking

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to manage, as an independent ICT specialist or as part of a team, the installation of a range of networks, including internetworking, security and e-business integration.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 16
5 core units plus
11 elective units

The elective units consist of:

- up to 11 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT511 Match IT needs with the strategic direction of the enterprise
ICTNWK529 Install and manage complex ICT networks
ICTSUS5187A Implement server virtualisation for a sustainable ICT system
ICTTEN6206A Produce an ICT network architecture design

Elective units

BSBSUS501 Develop workplace policy and procedures for sustainability
ICTICT501 Research and review hardware technology options for organisations
ICTICT509 Gather data to identify business requirements
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTICT603 Manage the use of appropriate development methodologies
ICTNWK501 Plan, implement and test enterprise communication solutions
ICTNWK502 Implement secure encryption technologies
ICTNWK503 Install and maintain valid authentication processes
ICTNWK504 Design and implement an integrated server solution
ICTNWK505 Design, build and test a network server
ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network
ICTNWK507 Install, operate and troubleshoot medium enterprise routers
ICTNWK508 Install, operate and troubleshoot medium enterprise switches
ICTNWK509 Design and implement a security perimeter for ICT networks
ICTNWK510 Develop, implement and evaluate system and application security
ICTNWK511 Manage network security
ICTNWK513 Manage system security
ICTNWK524 Install and configure network access storage devices
ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK531 Configure an internet gateway

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ICTNWK533 Configure and manage advanced virtual computing environments
ICTNWK534 Monitor and troubleshoot virtual computing environments
ICTNWK535 Install an enterprise virtual computing environment
ICTNWK615 Design and configure desktop virtualisation
ICTPMG501 Manage ICT projects
ICTSAD506 Produce a feasibility report
ICTSAS406 Implement and hand over system components
ICTSAS501 Develop, implement and evaluate an incident response plan
ICTSAS502 Establish and maintain client user liaison
ICTSAS503 Perform systems test
ICTSAS505 Review and update disaster recovery and contingency plans
ICTSAS512 Review and manage delivery of maintenance services
ICTSAS515 Manage the testing process
ICTOPN5119A Perform acceptance and commissioning tests on optical network
ICTOPN5120A Plan for an optical system upgrade and cut over
ICTOPN5122A Test the performance of specialised optical devices
ICTOPN5123A Analyse and integrate specialised optical devices in the network
ICTSUS6233A Integrate sustainability in ICT planning and design projects
ICTSUS6234A Establish a business case for sustainability and competitive advantage in ICT projects
ICTTEN4213A Configure and troubleshoot advanced network switching
ICTTEN5168A Design and implement an enterprise voice over internet protocol and a unified communications network
ICTTEN5201A Install, configure and test a server
ICTTEN5203A Dimension and design a radio frequency identification system
ICTTEN5204A Produce technical solutions from business specifications
ICTTEN5217A Plan a wireless mesh network
ICTTEN6172A Design and configure an IP-MPLS network with virtual private network tunnelling

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50415 Diploma of Information Technology Networking	ICA50411 Diploma of Information Technology Networking	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT50515 Diploma of Database Design and Development

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides skills and knowledge for an individual to be effective in the design and development of ICT database systems. The qualification builds on a base core of design and development competencies with elective choices covering business needs analysis, quality assurance and project management.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
9 core units plus
11 elective units

The elective units consist of:

- up to 11 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTDBS502 Design a database
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT502 Develop detailed component specifications from project specifications
ICTNWK514 Model preferred system solutions
ICTPRG425 Use structured query language
ICTPRG509 Build using rapid application development
ICTSAD501 Model data objects
ICTSAD502 Model data processes
ICTSUS6233A Integrate sustainability in ICT planning and design projects

Elective units

ICTDBS504 Integrate database with a website
ICTICT423 Select cloud storage strategies
ICTICT509 Gather data to identify business requirements
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTPMG501 Manage ICT projects
ICTPMG606 Manage ICT project quality
ICTPRG501 Apply advanced object-oriented language skills
ICTPRG503 Debug and monitor applications
ICTPRG504 Deploy an application to a production environment
ICTPRG505 Build advanced user interface
ICTPRG507 Implement security for applications
ICTPRG511 Monitor and support data conversion to new ICT system
ICTPRG514 Prepare for software development using rapid application development
ICTPRG515 Review developed software
ICTPRG523 Apply advanced programming skills in another language
ICTSAD506 Produce a feasibility report
ICTSAS502 Establish and maintain client user liaison

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ICTSAS505 Review and update disaster recovery and contingency plans
ICTWEB502 Create dynamic web pages
ICTTEN5204A Produce technical solutions from business specifications

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT50515 Diploma of Database Design and Development	ICA50511 Diploma of Database Design and Development	Updated to meet Standards for Training Packages	Equivalent qualification

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ICT50615 Diploma of Website Development

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to design, build and manage websites as an independent web developer or as part of a team.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 20
8 core units plus
12 elective units

The elective units consist of:

- up to 12 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWHS501 Ensure a safe workplace
ICTDBS504 Integrate database with a website
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT515 Verify client business requirements
ICTWEB501 Build a dynamic website
ICTWEB502 Create dynamic web pages
ICTWEB503 Create web-based programs
ICTWEB516 Research and apply emerging web technology trends

Elective units

BSBEBU501 Investigate and design e-business solutions
BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTDBS412 Build a database
ICTDBS502 Design a database
ICTICT406 Build a graphical user interface
ICTICT503 Validate quality and completeness of system design specifications
ICTICT509 Gather data to identify business requirements
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTNWK406 Install, configure and test network security
ICTNWK514 Model preferred system solutions
ICTPMG501 Manage ICT projects
ICTPRG406 Apply introductory object-oriented language skills
ICTPRG413 Use a library or pre-existing components
ICTPRG415 Apply skills in object-oriented design
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG425 Use structured query language
ICTPRG501 Apply advanced object-oriented language skills
ICTPRG503 Debug and monitor applications

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ICTPRG504 Deploy an application to a production environment
ICTPRG505 Build advanced user interface
ICTPRG506 Design application architecture
ICTPRG507 Implement security for applications
ICTPRG509 Build using rapid application development
ICTPRG512 Prepare for the build phase of an ICT system
ICTPRG513 Coordinate the build phase of an ICT system
ICTPRG514 Prepare for software development using rapid application development
ICTPRG515 Review developed software
ICTPRG523 Apply advanced programming skills in another language
ICTPRG527 Apply intermediate object-oriented language skills
ICTPRG601 Develop advanced mobile multi-touch applications
ICTSAD501 Model data objects
ICTSAD502 Model data processes
ICTSAD506 Produce a feasibility report
ICTSAS503 Perform systems tests
ICTSAS504 Develop and conduct client acceptance test
ICTSAS505 Review and update disaster recovery and contingency plans
ICTWEB504 Build a document using eXtensible markup language
ICTWEB505 Develop complex web page layouts
ICTWEB506 Develop complex cascading style sheets
ICTWEB508 Develop website information architecture
ICTWEB509 Use site server tools for transaction management
ICTTEN5204A Produce technical solutions from business specifications

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50615 Diploma of Website Development	ICA50611 Diploma of Website Development	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
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ICT50715 Diploma of Software Development

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in programming and software development.

A person with this qualification would create new software products to meet an initial project brief or customise existing software products to meet customer needs.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 16
10 core units plus
6 elective units

The elective units consist of:

- up to 6 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG501 Apply advanced object-oriented language skills
ICTPRG502 Manage a project using software management tools
ICTPRG503 Debug and monitor applications
ICTPRG504 Deploy an application to a production environment
ICTPRG520 Validate an application design against specifications
ICTPRG523 Apply advanced programming skills in another language
ICTPRG527 Apply intermediate object-oriented language skills
ICTPRG529 Apply testing techniques for software development

Elective units

ICTICT403 Apply software development methodologies
ICTICT503 Validate quality and completeness of system design specifications
ICTICT509 Gather data to identify business requirements
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry-specific technologies
ICTNWK514 Model preferred system solutions
ICTPMG501 Manage ICT projects
ICTPRG505 Build advanced user interface
ICTPRG506 Design application architecture
ICTPRG507 Implement security for applications
ICTPRG508 Create mashups
ICTPRG509 Build using rapid application development
ICTPRG510 Maintain custom software
ICTPRG512 Prepare for the build phase of an ICT system
ICTPRG513 Coordinate the build phase of an ICT system
ICTPRG514 Prepare for software development using rapid application development
ICTPRG515 Review developed software

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ICTPRG601 Develop advanced mobile multi-touch applications
ICTPRG604 Create cloud computing services
ICTSAD501 Model data objects
ICTSAD502 Model data processes
ICTSAD506 Produce a feasibility report
ICTSAS502 Establish and maintain client user liaison

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50715 Diploma of Software Development	ICA50711 Diploma of Software Development	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
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ICT50815 Diploma of Systems Analysis and Design

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to determine client business requirements and to support a project team in the analysis and redesign of systems to ensure they meet client needs.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 21
9 core units plus
12 elective units

The elective units consist of:

- up to 12 from the elective units listed below
- up to 4 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTDBS502 Design a database
ICTICT401 Determine and confirm client business requirements
ICTICT403 Apply software development methodologies
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT502 Develop detailed component specifications from project specifications
ICTICT509 Gather data to identify business requirements
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTSUS6233A Integrate sustainability in ICT planning and design projects
ICTTEN5204A Produce technical solutions from business specifications

Elective units

ICTICT510 Determine appropriate ICT strategies and solutions
ICTICT512 Plan process re-engineering strategies for business
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTNWK514 Model preferred system solutions
ICTPMG501 Manage ICT projects
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG509 Build using rapid application development
ICTPRG514 Prepare for software development using rapid application development
ICTPRG515 Review developed software
ICTPRG518 Monitor the system pilot
ICTPRG524 Develop high-level object-oriented class specifications
ICTPRG527 Apply intermediate object-oriented language skills
ICTSAD501 Model data objects
ICTSAD502 Model data processes
ICTSAS422 Scope implementation requirements
ICTSAS502 Establish and maintain client user liaison
ICTSAS505 Review and update disaster recovery and contingency plans
ICTSAS506 Update ICT system operational procedures

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ICTSAS507 Implement and evaluate systems for regulatory and standards compliance
ICTSAS513 Develop detailed test plans
ICTTEN5024A Provide consultancy and technical support in the customer premises equipment sector

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT50815 Diploma of Systems Analysis and Design	ICA50811 Diploma of Systems Analysis and Design	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT50915 Diploma of Digital Media Technologies

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in designing, developing and refining digital media technologies as an independent information and communications technology (ICT) specialist or as part of a team. It provides the opportunity to work in new and emerging digital media technology areas, such as online, and interactive design and development, and with tools and equipment, such as software, Web 2 tools, technologies and mobile devices.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 18
7 core units plus
11 elective units

The elective units consist of:

- up to 11 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package
- or any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBCRT501 Originate and develop concepts
BSBWHS501 Ensure a safe workplace
ICTGAM504 Manage interactive media production
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment
ICTICT419 Work effectively in the digital media industry
ICTICT515 Verify client business requirements
ICTPMG501 Manage ICT projects

Elective units

CUFDIG502A Design web environments
CUFDIG503A Design e-learning resources
CUFDIG504A Design games
CUFDIG507A Design digital simulations
CUFPOS201A Perform basic vision and sound editing
CUFPOS401A Edit screen content for fast turnaround
CUSSOU302A Record and mix a basic music demo
CUSSOU502A Produce sound recordings
CUVPHI519A Investigate and exploit innovative imaging options
ICTDBS504 Integrate database with a website
ICTDMT501 Incorporate and edit digital video
ICTGAM507 Develop intermediate 3-D software for games and interactive media
ICTGAM511 Manage testing of games and interactive media
ICTGAM512 Create and implement designs for a 3-D games environment
ICTGAM514 Design and create models for a 3-D and digital effects environment
ICTICT406 Build a graphical user interface
ICTICT511 Match ICT needs with the strategic direction of the enterprise
ICTICT514 Identify and manage the implementation of current industry specific technologies
ICTPRG409 Develop mobile applications

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ICTPRG413 Use a library or pre-existing components
ICTPRG418 Apply intermediate programming skills in another language
ICTPRG425 Use structured query language
ICTPRG527 Apply intermediate object-oriented language skills
ICTSAD504 Develop and conduct client acceptance test
ICTWEB429 Create a markup language document to specification
ICTWEB501 Build a dynamic website
ICTWEB516 Research and apply emerging web technology trends

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT50915 Diploma of Digital Media Technologies	ICA50911 Diploma of Digital Media Technologies	Updated to meet Standards for Training Packages	Equivalent qualification

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT60115 Advanced Diploma of Information Technology

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides high level information and communications technology (ICT), process improvement and business skills and knowledge to enable an individual to be effective in senior ICT roles within organisations. The qualification builds on a base core of management competencies, with specialist and general elective choices to suit particular ICT and business needs, especially in the areas of knowledge management and systems development.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 16
5 core units plus
11 elective units

The elective units consist of:

- 5 from one of the following specialist groups:
  - Group A Knowledge management
  - Group B Systems development.

- Of the remaining elective units:
  - up to 6 may be from the specialist elective groups below or from Group C general elective units below
  - up to 3 may be from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

BSBWOR502 Lead and manage team effectiveness
ICTICT608 Interact with clients on a business level
ICTICT610 Manage copyright, ethics and privacy in an ICT environment
ICTPMG609 Plan and direct complex ICT projects
ICTSUS6233A Integrate sustainability in ICT planning and design projects

Elective units

Specialist elective units

Group A Knowledge management

ICTDBS501 Monitor and improve knowledge management system
ICTDBS601 Build a data warehouse
ICTDBS602 Develop a knowledge management strategy
ICTICT604 Identify and implement business innovation
ICTICT605 Implement a knowledge management strategy

Group B Systems development

ICTICT508 Evaluate vendor products and equipment
ICTICT602 Develop contracts and manage contracted performance

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ICTPRG604 Create cloud computing services
ICTSAD504 Implement quality assurance processes for business solutions
ICTSAD505 Develop technical requirements for business solutions
ICTSAS601 Implement change management processes

General elective units

Group C

BSBINN601 Lead and manage organisational change
BSBMGT608 Manage innovation and continuous improvement
ICTDBS603 Determine suitability of database functionality and scalability
ICTICT601 Develop ICT strategic and action plans
ICTICT603 Manage the use of appropriate development methodologies
ICTICT606 Develop communities of practice
ICTICT609 Lead the evaluation and implementation of current industry specific technologies
ICTNWK601 Design and implement a security system
ICTNWK616 Manage security, privacy and compliance of cloud service deployment
ICTPMG606 Manage ICT project quality
ICTPRG601 Develop advanced mobile multi-touch applications
ICTPRG602 Manage the development of technical solutions from business specifications
ICTSAD602 Conduct knowledge audits

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT60115 Advanced Diploma of Information Technology	ICA60111 Advanced Diploma of Information Technology	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT60215 Advanced Diploma of Network Security

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to plan, design, manage and monitor an enterprise information and communications technology (ICT) network as an independent ICT specialist or as part of a team responsible for advanced ICT network security systems. The qualification has a high-level ICT technical base with appropriate security units and the ability to specialise in a number of areas, including voice, wireless, network infrastructure and sustainability.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 12
5 core units plus
7 elective units

The elective units consist of:

- up to 7 from the elective units listed below
- up to 2 from elsewhere in ICT Information and Communications Technology Training Package at Diploma or Advanced Diploma level
- up to 2 from any other Training Package or accredited course at Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTNWK502 Implement secure encryption technologies
ICTNWK509 Design and implement a security perimeter for ICT networks
ICTNWK601 Design and implement a security system
ICTNWK602 Plan, configure and test advanced server based security
ICTSUS6233A Integrate sustainability in ICT planning and design projects

Elective units

BSBPMG517 Manage project risk
CPPSEC5003A Assess security risk management options
CPPSEC5004A Prepare security risk management plan
CPPSEC5005A Implement security risk management plan
CPPSEC5006A Determine strategy for the implementation of biometric technology
CPPSEC5007A Assess biometric system
CPPSEC3009A Prepare and present evidence in court
ICTICT609 Lead the evaluation and implementation of current industry specific technologies
ICTNWK603 Plan, configure and test advanced internetwork routing solutions
ICTNWK604 Plan and configure advanced internetwork switching solutions
ICTNWK605 Design and configure secure integrated wireless systems
ICTNWK606 Implement voice applications over secure wireless networks
ICTNWK607 Design and implement wireless network security
ICTNWK608 Configure network devices for a secure network infrastructure
ICTNWK609 Configure and manage intrusion prevention system on network sensors
ICTNWK610 Design and build integrated VoIP networks
ICTNWK611 Configure call processing network elements for secure VoIP networks
ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks
ICTNWK613 Develop plans to manage structured troubleshooting process of enterprise networks
ICTNWK615 Design and configure desktop virtualisation
ICTNWK616 Manage security, privacy and compliance of cloud service deployment

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ICTSUS6234A Establish a business case for sustainability and competitive advantage in ICT projects
ICTSUS804 Use ICT to improve sustainability outcomes
ICTSUS7236A Manage improvements in ICT sustainability
ICTTEN8195B Evaluate and apply network security
ICTPMG8149B Evaluate and use telecommunications management networks
ICTPMG8143B Manage a telecommunications project

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT60215 Advanced Diploma of Network Security	ICA60211 Advanced Diploma of Network Security	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT60315 Advanced Diploma of Information Technology Business Analysis

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to be competent in business analysis in an information and communications technology (ICT) environment, either as an independent ICT specialist or as leader of a team. Individuals who complete this qualification will be competent to analyse, identify and coordinate relevant ICT business solutions to meet given organisational goals.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 15
9 core units plus
6 elective units

The elective units consist of:

- up to 6 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package at Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT608 Interact with clients on a business level
ICTICT610 Manage copyright, ethics and privacy in an IT environment
ICTPMG609 Plan and direct complex IT projects
ICTSAD601 Perform IT-focused enterprise analysis
ICTSAD603 Plan and monitor business analysis activities in an IT environment
ICTSAD604 Manage and communicate IT solutions
ICTSAD605 Elicit IT requirements
ICTSAD606 Analyse stakeholder requirements
ICTSAD607 Manage assessment and validation of IT solutions

Elective units

BSBWOR502 Lead and manage team effectiveness
BSBINN601 Lead and manage organisational change
BSBMGT608 Manage innovation and continuous improvement
ICTICT601 Develop IT strategic and action plans
ICTICT604 Identify and implement business innovation
ICTICT609 Lead the evaluation and implementation of current industry specific technologies
ICTNWK601 Design and implement a security system
ICTPMG601 Establish ICT project governance
ICTPMG603 Manage ICT project planning
ICTPMG606 Manage ICT project quality
ICTPRG602 Manage the development of technical solutions from business specifications
ICTSAD505 Develop technical requirements for business solutions

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Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT60315 Advanced Diploma of Information Technology Business Analysis	ICA60311 Advanced Diploma of Information Technology Business Analysis	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT60415 Advanced Diploma of Information Technology Project Management

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for an individual to manage a range of information and communications technology (ICT) projects to meet customer requirements. Projects may cover a wide range of specialities, including software development, hardware procurement and implementation, network analysis and deployment, and web and/or system development

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 15
6 core units plus
9 elective units

The elective units consist of:

- up to 9 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT610 Manage copyright, ethics and privacy in an ICT environment
ICTPMG601 Establish ICT project governance
ICTPMG602 Manage ICT project initiation
ICTPMG603 Manage ICT project planning
ICTPMG604 Manage ICT project delivery
ICTPMG605 Manage ICT project closure

Elective units

BSBINN601 Lead and manage organisational change
ICTICT505 Determine acceptable developers for projects
ICTICT509 Gather data to identify business requirements
ICTICT603 Manage the use of appropriate development methodologies
ICTICT608 Interact with clients on a business level
ICTICT609 Lead the evaluation and implementation of current industry specific technologies
ICTICT813 Manage ICT services
ICTPMG606 Manage ICT project quality
ICTPMG607 Manage and control ICT project risks
ICTPMG608 Manage ICT project systems implementation
ICTPRG602 Manage the development of technical solutions from business specifications
ICTSAS505 Review and update disaster recovery and contingency plans
ICTSAS515 Manage the testing process

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT60415 Advanced Diploma of Information Technology Project Management	ICA60411 Advanced Diploma of Information Technology Project Management	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT60515 Advanced Diploma of Computer Systems Technology

Modification History

Release	**Comments**
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge required to coordinate and administer the installation, commissioning and ongoing maintenance of a range of networks, enterprise servers and systems, including internetworking, security and e-business solutions.

An individual with these skills may be part of a team or provide services as an independent information and communications technology (ICT) specialist.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Nil

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Packaging Rules

Total number of units = 18
12 core units plus
6 elective units

The elective units consist of:

- up to 6 from the elective units listed below
- up to 3 from elsewhere in ICT Information and Communications Technology Training Package at Advanced Diploma level
- up to 3 from any other Training Package or accredited course at Diploma or Advanced Diploma level.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network
ICTNWK507 Install, operate and troubleshoot medium enterprise routers
ICTNWK508 Install, operate and troubleshoot medium enterprise switches
ICTNWK509 Design and implement a security perimeter for ICT networks
ICTNWK529 Install and manage complex ICT networks
ICTNWK602 Plan, configure and test advanced server based security
ICTNWK607 Design and implement wireless network security
ICTPMG608 Manage ICT project systems implementation
ICTPMG609 Plan and direct complex ICT projects
ICTPRG527 Apply intermediate object-oriented language skills
ICTWEB501 Build a dynamic website
ICTWEB502 Create dynamic web pages

Elective units

ICTDBS504 Integrate database with a website
ICTICT502 Develop detailed component specifications from project specifications
ICTICT604 Identify and implement business innovation
ICTICT609 Lead the evaluation and implementation of current industry specific technologies
ICTNWK502 Implement secure encryption technologies
ICTNWK503 Install and maintain valid authentication processes
ICTNWK504 Design and implement an integrated server solution
ICTNWK505 Design, build and test a network server
ICTNWK524 Install and configure network access storage devices
ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK533 Configure and manage advanced virtual computing environments
ICTNWK534 Monitor and troubleshoot virtual computing environments

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ICTNWK535 Install an enterprise virtual computing environment
ICTNWK603 Plan, configure and test advanced internetwork routing solutions
ICTNWK605 Design and configure secure integrated wireless systems
ICTNWK610 Design and build integrated VoIP networks
ICTNWK611 Configure call processing network elements for secure VoIP networks
ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks
ICTNWK613 Develop plans to manage structured troubleshooting process of enterprise networks
ICTNWK615 Design and configure desktop virtualisation
ICTNWK616 Manage security, privacy and compliance of cloud service deployment
ICTPRG505 Build advanced user interface
ICTPRG601 Develop advanced mobile multi-touch applications
ICTPRG602 Manage the development of technical solutions from business specifications
ICTSAS517 Use network tools
ICTWEB503 Create web-based programs
ICTWEB505 Develop complex web page layouts

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT60515 Advanced Diploma of Computer Systems Technology	ICA60511 Advanced Diploma of Computer Systems Technology	Updated to meet Standards for Training Packages	Equivalent qualification

Links

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ICT80115 Graduate Certificate in Information Technology and Strategic Management

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides skills and knowledge for individuals to lead the analysis, implementation and management of emerging and converging information and communication technologies as they are integrated into the business process to support organisational strategic goals.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Entry to this qualification is limited to those who:

- Have completed a Bachelor degree in related fields of study.

or

- Have completed a Diploma or Advanced Diploma qualification in related fields of study and 2 years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

or

- Three years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

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Packaging Rules

Total number of units = 4
1 core units plus
3 elective units

The elective units consist of:

- up to 3 from the elective units listed below
- up to 1 from elsewhere in ICT Information and Communications Technology Training Package or accredited course at Graduate Certificate level or above.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTICT809 Facilitate business analysis

Elective units

BSBLDR803 Develop and cultivate collaborative partnerships and relationships
ICTICT801 Lead research into identifying new marketplace opportunities
ICTICT802 Direct ICT services
ICTICT803 Endorse business plan components for a new initiative
ICTICT804 Direct ICT in a supply chain
ICTICT805 Direct ICT procurement
ICTICT806 Direct outsourced ICT services
ICTICT807 Direct research and business response to new ICT technology
ICTICT808 Direct the development of a knowledge management strategy for a business
ICTICT810 Synchronise ICT projects
ICTICT811 Manage an information architecture project
ICTICT812 Develop a business intelligence framework
ICTICT813 Manage ICT services
ICTICT814 Develop cloud computing strategies for a business
ICTSUS801 Plan and manage virtualisation for ICT sustainability
ICTSUS802 Conduct a business case study for integrating sustainability in ICT planning and design projects
ICTSUS804 Use ICT to improve sustainability outcomes
ICTSUS7236A Manage improvements in ICT sustainability

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT80115 Graduate Certificate in Information Technology and Strategic Management	ICA70111 Vocational Graduate Certificate in Information Technology and Strategic Management	Recoded to meet AQF requirements	Equivalent qualification

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT80215 Graduate Certificate in Information Technology Sustainability

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for individuals to plan and manage the implementation of sustainability strategies for information and communications technology (ICT) networks and systems, including conducting applied research, developing organisational policy, and devising strategies to meet sustainability targets.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

Entry to this qualification is limited to those who:

- Have completed a Bachelor degree in related fields of study.

or

- Have completed a Diploma or Advanced Diploma qualification in related fields of study and 2 years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

or

- Three years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

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Packaging Rules

Total number of units = 4
1 core unit plus
3 elective units

The elective units consist of:

- up to 3 from the elective units listed below
- up to 1 from elsewhere in ICT Information and Communications Technology Training Package or accredited course at Graduate Certificate level or above.

The elective units chosen must be relevant to the work outcome and meet local industry needs.

Core units

ICTSUS802 Conduct a business case study for integrating sustainability in ICT planning and design projects

Elective units

BSBLDR803 Develop and cultivate collaborative partnerships and relationships
ICTICT806 Direct outsourced ICT services
ICTICT807 Direct research and business response to new ICT technology
ICTICT809 Facilitate business analysis
ICTICT810 Synchronise ICT projects
ICTSUS801 Plan and manage virtualisation for ICT sustainability
ICTSUS803 Research strategies using SAP solutions for sustainable economic and environmental outcomes
ICTSUS804 Use ICT to improve sustainability outcomes
ICTSUS7236A Manage improvements in ICT sustainability
ICTSUS8237A Lead applied research in ICT sustainability
ICTSUS8238A Conduct and manage a life cycle assessment for sustainability

Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT80215 Graduate Certificate in Information Technology Sustainability	ICA70211 Vocational Graduate Certificate in Information Technology Sustainability	Recoded to meet AQF requirements	Equivalent qualification

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ICT80315 Graduate Certificate in Telecommunications

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for individuals to lead strategic and operational information and telecommunications networking solutions. Services and solutions cover a wide range of simple and convergent information and communications technologies requiring the analysis of current and future business and customer requirements; service or solution design; testing, delivery and optimisation.

The individual devises innovative solutions and delivery, using extensive consultation and collaboration with key stakeholders, in a range of situations including complex, geographically dispersed organisations.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

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Entry Requirements

Entry to this qualification is limited to those who:

- Have completed a Bachelor degree in related fields of study.

or

- Have completed a Diploma or Advanced Diploma qualification in related fields of study and 2 years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

or

- Three years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

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Packaging Rules

Total number of units = 4
1 core unit plus
3 elective units

The elective units must be relevant to the industry-supported vocational outcomes, local industry requirements and is to be chosen as follows:

The elective units consist of:

- up to 3 from the elective units listed below
- up to 1 from elsewhere in ICT Information and Communications Technology Training Package or accredited course at Graduate Certificate level or above.

Units selected from other Training Packages or accredited courses must not duplicate units selected from or available within the ICT Information and Communications Technology Training Package.

Core units

ICTPMG8143B Manage a telecommunications project

Elective units

BSBINN801 Lead innovative thinking and practice
BSBLDR803 Develop and cultivate collaborative partnerships and relationships
ICTICT811 Manage an information architecture project
ICTICT813 Manage ICT services
ICTICT815 Manage automated ICT system applications using enterprise wide operating system
ICTPMG8142A Manage a telecommunications workplace
ICTPMG8149B Evaluate and use telecommunications management networks
ICTRFN801 Produce a radio link budget
ICTRFN8180B Analyse a cellular mobile network system
ICTRFN8181B Analyse a satellite communications system
ICTSUS804 Use ICT to improve sustainability outcomes
ICTSUS8237A Lead applied research in ICT sustainability
ICTSUS8238A Conduct and manage a life cycle assessment for sustainability
ICTTEN802 Manage alignment of systems with product and technology strategy
ICTTEN803 Translate domain and solution architectures into platform requirements and designs
ICTTEN804 Manage end to end architectural solutions across multiple domains
ICTTEN805 Manage solution architecture and impacts in line with organisational processes
ICTTEN806 Manage application layer solutions
ICTTEN807 Lead voice, data and internet protocol network solutions
ICTTEN808 Manage network testing strategies
ICTTEN809 Analyse business specifications to produce technical solutions

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Qualification Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICT80315 Graduate Certificate in Telecommunications	Not applicable	New qualification	No equivalent qualification

Links

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ICT80415 Graduate Diploma of Telecommunications Network Engineering

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for individuals in strategic and operational leadership roles in the technology domain. The individual provides domain thought leadership; assesses best possible and commercially viable telecommunications networks and systems solutions and services; plans changes to networks and systems in line with business strategy and enterprise product and technology roadmaps; analyses potential and real network problems; and develops innovative, commercially advantageous solutions.

The individual is a recognised authority and trusted business advisor for delivering tomorrow's solutions as well as optimisation of current network system performance and customer satisfaction. Research, analysis, design, development and deployment of technical and commercially viable solutions for: cloud computing, digital signal processing, cellular and satellite systems and telecommunications networks are requirements of the individual.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

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Entry Requirements

Entry to this qualification is limited to those who:

- Have completed a Bachelor degree in related fields of study and 2 years equivalent full-time relevant workplace experience at a significant level of project or program leadership and management responsibility and/or complexity in an enterprise.

or

- Have completed a Diploma or Advanced Diploma qualification in related fields of study and 3 years equivalent full-time relevant workplace experience at a significant level of project or program leadership and management responsibility and/or complexity in an enterprise.

or

- Five years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

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Packaging Rules

Total number of units = 8
3 core units plus
5 elective units

The elective units must be relevant to the industry-supported vocational outcomes, local industry requirements and is to be chosen as follows:

The elective units consist of:

- up to 5 from the elective units listed below
- up to 1 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Graduate Certificate level or above.

Units selected from other Training Packages or accredited courses must not duplicate units selected from or available within the ICT Information and Communications Technology Training Package.

Core units

ICTPMG8143B Manage a telecommunications project
ICTPMG8149B Evaluate and use telecommunications management networks
ICTSUS8237A Lead applied research in ICT sustainability

Elective units

ICTICT809 Facilitate business analysis
ICTICT801 Lead research into identifying new marketplace opportunities
ICTICT803 Endorse business plan components for a new initiative
ICTICT808 Direct the development of a knowledge management strategy for a business
ICTICT812 Develop a business intelligence framework
ICTICT814 Develop cloud computing strategies for a business
ICTICT815 Manage automated ICT system applications using enterprise wide operating system
ICTRFN801 Produce a radio link budget
ICTRFN8180B Analyse a cellular mobile network system
ICTRFN8181B Analyse a satellite communications system
ICTSUS8238A Conduct and manage a life cycle assessment for sustainability
ICTTEN801 Plan a transmission network
ICTTEN805 Manage solution architecture and impacts in line with organisational processes
ICTTEN807 Manage voice, data and internet protocol network solutions
ICTTEN808 Manage network testing strategies
ICTTEN809 Analyse business specifications to produce technical solutions
ICTTEN8194A Investigate the application of cloud networks in telecommunications switching
ICTTEN8195B Evaluate and apply network security

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ICTTEN8196A Evaluate and apply digital signal processing to communications system
ICTTEN8197A Produce engineering solutions using numerical computations and simulation
BSBINN801 Lead innovative thinking and practice

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICT80415 Graduate Diploma in Telecommunications Network Engineering	ICT80110 Vocational Graduate Diploma in Telecommunications Network Engineering	Recoded to meet AQF requirements. Changes to the Core and Elective Units.	No equivalent qualification

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICT80515 Graduate Diploma of Telecommunications and Strategic Management

Modification History

Release	Comments
Release 1	This qualification first released with ICT Information and Communications Technology Training Package Version 1.0.

Qualification Description

This qualification provides the skills and knowledge for individuals to undertake strategic commercial and technical roles in the telecommunications industry. Individuals in this capacity collaborate with business leaders to set the telecommunications agenda, creating and deploying innovative and collaborative technologies that connect people and communities, enable superior levels of personal and collective productivity, and viably grow the telecommunications industry and enterprise profitability.

The individual is an authority and trusted business advisor in strategy development, identifying, designing, developing and deploying tomorrow's solutions. The individual leads and applies research; and analyses, designs, develops and deploys technical and commercially viable integrated solutions for businesses and organisations. The individual is regularly called upon to solve highly complex business and technical problems in geographically dispersed, dynamic and challenging environments.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

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Entry Requirements

Entry to this qualification is limited to those who:

- Have completed a Bachelor degree in related fields of study and 2 years equivalent full-time relevant workplace experience at a significant level of project or program leadership and management responsibility and/or complexity in an enterprise.

or

- Have completed a Diploma or Advanced Diploma qualification in related fields of study and 3 years equivalent full-time relevant workplace experience at a significant level of project or program leadership and management responsibility and/or complexity in an enterprise.

or

- Five years equivalent full-time relevant workplace experience at a significant level of leadership and management responsibility and/or complexity in an enterprise.

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Packaging Rules

Total number of units = 8
2 core units plus
6 elective units

The elective units must be relevant to the industry-supported vocational outcomes, local industry requirements and is to be chosen as follows:

The elective units consist of:

- up to 6 from the elective units listed below
- up to 1 from elsewhere in ICT Information and Communications Technology Training Package or any other Training Package or accredited course at Graduate Certificate level or above.

Units selected from other Training Packages or accredited courses must not duplicate units selected from or available within the ICT Information and Communications Technology Training Package.

Core units

BSBINN801 Lead innovative thinking and practice
ICTICT809 Facilitate business analysis

Elective units

ICTICT801 Lead research into identifying new marketplace opportunities
ICTICT803 Endorse business plan components for a new initiative
ICTICT808 Direct the development of a knowledge management strategy for a business
ICTICT812 Develop a business intelligence framework
ICTICT814 Develop cloud computing strategies for a business
ICTICT815 Manage automated ICT system applications using enterprise wide operating system
ICTPMG8143B Manage a telecommunications project
ICTPMG8149B Evaluate and use telecommunications management networks
ICTRFN801 Produce a radio link budget
ICTRFN8180B Analyse a cellular mobile network system
ICTRFN8181B Analyse a satellite communications system
ICTSUS8237A Lead applied research in ICT sustainability
ICTSUS8238A Conduct and manage a life cycle assessment for sustainability
ICTTEN801 Plan a transmission network
ICTTEN805 Manage solution architecture and impacts in line with organisational processes
ICTTEN807 Manage voice, data and internet protocol network solutions
ICTTEN808 Manage network testing strategies
ICTTEN809 Analyse business specifications to produce technical solutions
ICTTEN8194A Investigate the application of cloud networks in telecommunications switching

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ICTTEN8195B Evaluate and apply network security
ICTTEN8196A Evaluate and apply digital signal processing to communications system
ICTTEN8197A Produce engineering solutions using numerical computations and simulation

Qualification Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**E/N**
ICT80515 Graduate Diploma of Telecommunications and Strategic Management	Not applicable	New qualification	No equivalent qualification

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDBS401 Identify physical database requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify the scope, and the physical and security requirements of a database.

It applies to individuals employed as database administrators who are required to plan a database to a user's requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the database scope	1.1 Review the requirements of the user, and the current system's architecture 1.2 Determine database size from the requirements and the technical specifications 1.3 Document the database design, and scope, of the project 1.4 Evaluate several database management systems against the requirements, and make the appropriate selection
2. Identify the database requirements	2.1 Review the technical specifications for the database 2.2 Identify the database tables and relationships 2.3 Identify the database data dictionary, table attributes and keys 2.4 Determine the database reports based on the acceptance criteria and requirements
3.Identify the security requirements	3.1 Review the system security plan 3.2 Clarify and confirm that the database management system, and user security, aligns with the system security plan 3.3 Identify, evaluate and record database performance, recovery and audit trail needs
4. Seek client feedback and approval	4.1 Present database scope, technical requirements and security documentation to the user for feedback 4.2 Review user feedback and adjust the database documentation, as required 4.3 Present database documentation to the user for final approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.1-2.4, 3.1-3.3, 4.2	• Interprets and analyses textual information in order to gather detailed information, and confirm requirements
Writing	1.3, 2.4, 3.3, 4.1, 4.2	• Uses technically appropriate language and presents information in a format and layout that conveys factual information
Oral Communication	1.1, 3.2, 4.1-4.3	• Uses active listening, questioning and summarising skills, in order to effectively identify, and confirm, requirements
Get the work done	1.1-1.4, 2.1-2.4, 3.2, 3.3, 4.2	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Applies formal problem-solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts, identifying, and evaluating several options for action • Understands key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when identifying database scope and requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS401 Identify physical database requirements	ICADBS401A Identify physical database requirements	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS401 Identify physical database requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse client requirements
- identify the technical considerations affecting the physical design of a database
- document the database requirements
- review the security plan for the database.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the principles of databases and database design
- outline the general features, and capabilities, of current industry-accepted hardware and software products
- explain the quality assurance practices that apply to database design
- identify the client's business domain
- describe database requirements appropriate for client's business.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- special purpose materials and industry software packages
- user business requirements
- technical documentation defining the architecture platform
- operating system specifications
- database supplier technical specifications and manuals
- data samples
- the database package.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDBS402 Complete database backup and restore

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish backup and recovery procedures, in accordance with organisational requirements, and consistent with the database architecture.

It applies to individuals who are technical support personnel, such as help-desk supervisors, information and communications technology (ICT) support technicians, database support technicians and user-support specialists.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review the database architecture to plan backup and recovery	1.1 Examine the architecture of a database file system 1.2 Determine the most appropriate methods for backup and recovery 1.3 Identify and examine the likely or possible risk and failure scenarios 1.4 Prepare a backup maintenance schedule 1.5 Prepare a contingency plan
2. Determine backup methods appropriate to database requirements	2.1 Evaluate the range of backup and restoration methods, based on organisational and security standards, and on the assessment of likely, or possible, failure scenarios 2.2 Complete full off-line backups according to organisational and security standards, with minimal down time 2.3 Complete online file backups, as determined by organisational and security standards, with minimal down time 2.4 Employ disk mirroring and redundant array of inexpensive disks (RAID) hard disk configurations to keep copies of files 2.5 Arrange off-site copies of backup files
3. Establish recovery points and disaster-recovery procedures	3.1 Determine database recovery points based on the backup arrangements, according to organisational guidelines 3.2 Test the restore process to ensure that the database can be restored to a given recovery point, with minimal down time 3.3 Complete the restoration of the database to the point of failure, without loss of committed transactions
4. Create and deploy a standby database	4.1 Create or set up a standby database, in order to meet organisational guidelines 4.2 Implement a standby database to support critical business functions 4.3 Prepare the documentation for a standby database

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1	• Analyses complex textual information in order to evaluate a range of backup and restoration methods
Writing	1.4, 1.5, 4.3	• Uses technically specific language in developing plans and documentation • Articulates information, and presents this information, in a clear, concise, sequential and grammatically-correct manner, and in a writing style that is appropriate to the audience
Oral Communication	1.2, 1.3, 1.4, 2.1	• Facilitates successful discussions by employing effective listening, questioning and summarising skills to ensure that appropriate information is gathered
Navigate the world of work	2.2, 2.3, 3.1, 4.1	• Recognises and follows, both explicit and implicit protocols, and meets expectations associated with own role when complying with organisational and security standards, and guidelines
Get the work done	All	• Takes responsibility for planning, sequencing and prioritising tasks, and own workload for efficiency, and for effective outcomes • Makes routine decisions, and implements standard procedures, for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter data, and code, present information. and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS402 Complete database backup and restore	ICADBS402A Complete database backup and restore	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS402 Complete database backup and restore

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine and prepare the appropriate methods for backup, maintenance and recovery, including a contingency plan
- implement the backup and restore procedures, with minimum disruption to the business
- create, implement and document a standby database.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the basic principles of:
  - diagnostic tools
  - structured query language (SQL)
  - databases
  - tuning methodologies
- outline and apply the principles of:
  - backup and recovery methods
  - database administration
  - database security
  - open file backup procedures and restore operations.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- documentation standards
- backup and recovery policies
- sites with a representative range of current industry standard software and diagnostic tools
- database package with data
- technical records
- organisational guidelines
- vendor documentation
- the server, and a networked personal computer, on which to conduct the backup and restore procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTDBS403 Create basic databases

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, develop and test a database in order to meet a specification.

It applies to individuals who may be either database, or web designers, required to create a simple database to store information for an online application, using a simple entity relational database.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the requirements for the database	1.1 Determine the information that the database is required to hold 1.2 Develop a written requirement report for the functionality of the database 1.3 Complete the documentation, and submit it to the appropriate person for approval
2. Use data modelling to design the database to suit requirements	2.1 Design an entity-relationship (ER) diagram to model the relationships between the entities and the attributes that the database will hold 2.2 Develop primary and foreign keys to link the entities 2.3 Develop a data dictionary 2.4 Complete the documentation, and submit it to the appropriate person for approval
3. Create a database on a web or database server	3.1 Use the appropriate language on a web or database server to create one or more databases 3.2 Use the appropriate language on a web or database server to create tables 3.3 Populate the database fields
4. Test the database and debug	4.1 Test the database on the web or database server 4.2 Ensure that the information represented matches the requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3	• Analyses textual information to establish requirements
Writing	1.2, 1.3	• Uses technically appropriate language and presents information in a format, and layout, that is appropriate to the requirements
Oral Communication	1.1, 1.3, 2.4	• Listens, and participates, in oral exchanges to effectively identify and confirm requirements • Presents information using appropriate and effective language in negotiating the best outcome
Navigate the world of work	1.3, 2.4	• Recognises and follows, both explicit and implicit, procedures, and meets the expectations associated with own role when submitting the documentation for approval
Interact with others	1.3, 2.4	• Recognises and applies the protocols governing what to communicate, with whom and how, in a range of work contexts, when submitting the documentation to the appropriate person for approval
Get the work done	1.1, 2.1-2.4, 3.1-3.3, 4.1, 4.2	• Plans a range of routine, and some non-routine, tasks, accepting stated goals and aiming to achieve them efficiently • In more complex, non-routine situations, uses a formal decision-making process, setting or clarifying goals, gathering information, and identifying and evaluating several choices against a limited set of criteria • Applies formal problem-solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts, and identifying and evaluating several options for action • Understands key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these when designing and creating a database

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS403 Create basic databases	ICADBS403A Create basic databases	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS403 Create basic databases

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research client requirements for a database solution
- design a database that meets client requirements
- create a database on a web hosting service or server to meet client requirements by a due date
- test and debug the database.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of open platforms, including browsers and databases
- list the processes associated with the creation of entities, attributes, and in populating fields, using both software solutions and script- based input
- describe data-modelling techniques to design a database
- outline the steps in database design, modelling and implementation
- describe the internet operation related to web servers and clients
- identify the naming conventions appropriate to database design
- identify security restrictions on servers, incorporating some theoretical concepts
- describe best practice communication, and accessibility, for audiences with special needs.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment, materials and industry software packages
- database and database management system
- the internet and web browser software
- software for creating entity-relationship (ER) diagrams
- software development environment
- the server.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDBS404 Identify and resolve common database performance problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to diagnose database problems, as well as to configure and tune the database in order to maintain consistent performance.

It applies to individuals who are experienced technical support personnel, such as help-desk supervisors, database support technicians, information and communications technology (ICT) support technicians, and user-support specialists, who are responsible for maintaining the performance of a database.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Diagnose problems	1.1 Determine an appropriate database performance diagnostic tool to use, based on organisational database requirements, and vendor recommendations 1.2 Run a diagnostic tool to identify the issues causing degradation of the database's performance 1.3 Determine and record where the inappropriate use/s of database and temporary table spaces occur 1.4 Carry out appropriate fixes, based on diagnostic results
2. Configure the database	2.1 Adopt a distributed files architecture to minimise input and output (I/O) contention 2.2 Ensure that database backup procedures are appropriate for the method of data storage 2.3 Reconfigure rollback segments 2.4 Configure the database and test its performance
3. Tune the database	3.1 Track module performance according to its specifications 3.2 Monitor and tune the efficiency of structured query language (SQL), as required 3.3 Monitor and measure the performance of shared pool, blocks and buffers 3.4 Detect, identify and resolve any contentions that may arise in the real-time operation of the database 3.5 Reconfigure the database according to specifications

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.2	• Analyses and interprets textual information in order to establish performance issues and their corresponding solution(s)
Writing	1.3	• Uses technically appropriate language and format, when recording data
Oral Communication	1.1	• Uses effective listening, questioning and summarising skills to ensure that the correct information is gathered
Get the work done	All	• Uses a formal, logical planning processes, together with an increasingly intuitive understanding of context, to identify relevant information and risks, and to identify and evaluate alternative strategies and resources • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options • Uses familiar digital technologies and systems to access information, search and enter data, code, present information and communicate with others, while maintaining data security and safety at all times

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS404 Identify and resolve common database performance problems	ICADBS404A Identify and resolve common database performance problems	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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Assessment Requirements for ICTDBS404 Identify and resolve common database performance problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- correctly identify common database problems
- select appropriate solutions to solve the problem
- implement solutions to improve database performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of database design and structured query language (SQL)
- describe the principles of database administration
- describe diagnostic tools and database tuning methodologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- special purpose materials
- industry software packages
- diagnostic tools
- database operating on a network.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTDBS407 Monitor physical database implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake database-management system modelling and to monitor database performance.

It applies to database support staff required to test and scrutinise the operation of a physical database, in order to ensure that it functions as efficiently as possible.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Undertake database management system modelling	1.1 Review the database prototype as appropriate, to determine the acceptance criteria and performance standards 1.2 Load the test data according to the technical sequence detailed in the relevant documentation 1.3 Generate a test schedule for the database, of tasks to be performed and the results expected
2. Monitor database performance	2.1 Evaluate database performance against the acceptance criteria and performance standards 2.2 Identify discrepancies in the results, when the expected outcomes do not meet the acceptance criteria 2.3 Identify areas needing enhancement, and document the changes to be made 2.4 Modify the database according to project standards 2.5 Repeat performance testing until the expected results are achieved
3. Seek client feedback and sign-off	3.1 Present test results in a document, and provide to the client for feedback 3.2 Incorporate client change requests as appropriate 3.3 Obtain client sign-off to the monitoring process

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1-2.3, 3.2	• Analyses and interprets textual information to establish performance requirements and discrepancies
Writing	1.3, 2.3, 3.1	• Uses appropriate language, layout and format in logically presenting technical data and other information
Oral Communication	1.1, 3.1-3.3	• Listens, and participates, in oral exchanges in order to effectively identify and confirm requirements • Presents information using appropriate and effective language in order to convey information
Get the work done	1.1-1.3, 2.1-2.5	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against the agreed criteria • Applies key principles and concepts underpinning the design and operation of digital systems, and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS407 Monitor physical database implementation	ICADBS407A Monitor physical database implementation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS407 Monitor physical database implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify technical considerations affecting the implementation of a database
- analyse and monitor performance issues during the implementation of a database
- modify a database to meet project and client performance requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain
- list current industry-accepted hardware and software products
- describe requirements of basic database design
- identify required database performance standards
- outline quality assurance practices
- outline testing and benchmarking processes
- list three or more current principles of databases.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- industry software packages
- the database management system (DBMS)
- the target database prototype
- testing and benchmarking software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTDBS408 Link an RFID system to a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to transfer radio frequency identification (RFID) data to a database.

It applies to individuals who are required to maintain RFID data and make it available to an RFID system.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the data mapping and integration requirements	1.1 Identify and document the format of the data from the RFID system, including data schema 1.2 Collect the required data, target database requirements and implementation details, ensuring the uniqueness of entries
2. Perform data transition	2.1 Write and test conversion programs, and use conversion tools 2.2 Ensure clean data take-on by converting according to database requirements 2.3 Use database adaptors and interfaces for data transition
3. Check data transition	3.1 Verify that the data transition has been completed, according to the requirements 3.2 Document programs, procedures and processes, according to the requirements of the client 3.3 Provide conversion reports to the client for sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1	• Analyses and interprets textual information to establish requirements and verify data
Writing	1.1, 1.2, 2.1, 3.2, 3.3	• Uses appropriate technical language, format and layout when recording data and producing technical documentation
Oral Communication	1.1, 1.2, 3.1, 3.3	• Uses active listening, questioning and summarising skills when gathering information and negotiating best project outcome
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 3.1	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication during data mapping and integration requirements • Uses familiar digital technologies and systems to access information, search and enter data and code, present information and communicate with others, cognisant of data security and safety

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS408 Link an RFID system to a database	ICADBS408A Link an RFID system to a database	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS408 Link an RFID system to a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify formats of radio frequency identification (RFID) system output and data fields in database
- analyse, write, install and test conversion programs
- identify format of data fields of database
- write, or obtain, and install conversion software
- compile entries in database reports.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the client database's data structures
- describe client data management, data security policy, and procedures
- describe and apply data analysis in determining;
  - data types
  - data structures
  - queries
  - report design
- identify the data source names in use by the organisation
- describe the open database connection (ODC)
- list the primary files, and requirements, of transaction logs to confirm appropriate database activity
- outline quality assurance practices
- identify the required software tools
- outline the system's data requirements
- define the system's current functionality
- identify the website foundation.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- industry software packages
- conversion tools
- the database's software
- networked computers
- organisational guidelines
- radio frequency identification (RFID) equipment specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDBS409 Monitor and administer a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage databases including start up, operation, testing, monitoring and maintenance, in accordance with organisational requirements.

It applies to individuals employed as database support staff who are required to maintain a database, monitor its performance and access, as well as to administer its security.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Start up a database	1.1 Configure the system for a database start-up 1.2 Monitor the database start-up and operation for irregularities
2. Manage the database	2.1 Take action to ensure that a data dictionary has been compiled and that data structures are in place 2.2 Maintain data integrity constraints, according to business requirements 2.3 Create and design indexes, and multiple-field keys, according to business requirements 2.4 Monitor the locking options chosen for the database 2.5 Confirm that recent backups of the database have been stored, and that backups can be retrieved as a full working copy 2.6 Monitor data storage space for ongoing viability, and resize as needed 2.7 Update the data according to organisational guidelines
3. Manage database access	3.1 Allocate or remove access privileges according to user status 3.2 Monitor network server log-in log file for illegal log-in attempts, or for security breaches 3.3 Manage system resources in the context of database administration
4. Document database maintenance tasks	4.1 Document changes to database start-up procedures 4.2 Itemise database management structures 4.3 File authorisations for access changes 4.4 Detail the procedures for monitoring log files 4.5 Record the procedures to manage systems resources

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.5, 3.2	• Analyses textual information to determine start-up and operation irregularities
Writing	2.7, 4.1, 4.2, 4.4, 4.5	• Uses appropriate language and required format for updating data, and presenting information in technical and business documents
Oral Communication	2.5, 3.1	• Uses active listening and questioning skills when determining status of periodic tasks and activities
Navigate the world of work	2.7	• Follows organisational requirements for updating data
Get the work done	All	• Monitors actions against stated goals during compilation of data dictionary and data structures, and when managing a database, according to business requirements • Uses a formal decision-making process, setting or clarifying goals, gathering information, and identifying, and evaluating several choices against a limited set of criteria • Understands key principles and concepts underpinning the design, and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS409 Monitor and administer a database	ICADBS409A Monitor and administer a database	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTDBS409 Monitor and administer a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- configure a database start-up
- confirm data integrity
- monitor data storage requirements for database
- update data
- update database access.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline backup and recovery methodologies
- explain the architectural design of relational databases
- explain the concept of database security
- outline the process involved in the selection and use of appropriate database management tools
- explain the principles of structured query language (SQL)
- outline the tasks involved in database administration
- outline the tuning methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- industry software packages
- a live database, preferably on a local area network (LAN) on which there is a server that offers log-in functionality.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDBS412 Build a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build, implement, test and evaluate a database, using an established design.

It applies individuals employed as database administrators and designers who are required to build databases for information storage and retrieval requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm the database design	1.1 Review the database design documentation, including data structures, queries, reports and user interface 1.2 Compare the database access and security feature design with the organisational security plan 1.3 Document inconsistencies in the database and security design
2. Create a prototype	2.1 Develop a prototype according to the database design 2.2 Populate database tables with suitable data, including current business data 2.3 Write conversion programs to import data from existing systems 2.4 Develop test data to assess database features 2.5 Assess functionality of the prototype with the client, including identifying errors in the program code, and modifying screens, and reports 2.6 Incorporate feedback from the client into the prototype 2.7 Obtain client sign-off for the prototype
3. Test the database	3.1 Develop an implementation plan for the database 3.2 Install database management system software on the network 3.3 Populate the database tables with business data 3.4 Implement security and access controls 3.5 Test database output and security controls, and record results
4. Evaluate the database	4.1 Review the database with the client for final approval 4.2 Complete database documentation 4.3 Identify and document user training requirements 4.4 Seek and secure client acceptance of the database

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.5, 2.6, 4.1, 4.3	• Analyses and interprets textual information in order to establish client system requirements and establish design inconsistencies
Writing	1.3, 2.3, 2.7, 3.1, 3.5, 4.2	• Uses appropriate technical terminology in recording test results and discrepancies • Produces reports and documentation that are cohesive and well-structured, in order to convey detailed and accurate information, and instructions
Oral Communication	1.1, 2.5-2.7, 4.1, 4.3, 4.4	• Uses active listening, questioning and summarising skills to establish client requirements, training needs and when seeking product or stage approval
Interact with others	4.4	• Recognises and applies the protocols governing what to communicate, with whom, and how
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses a formal decision-making process, setting or clarifying goals, gathering information, and identifying and evaluating several choices, against a limited set of criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between different options • Understands the key principles and concepts underpinning the design, and operation of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS412 Build a database	ICADBS412A Build a database	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
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Assessment Requirements for ICTDBS412 Build a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify client data management and security requirements
- produce a prototype data base
- populate and perform tests
- discuss results with client for approval
- implement the data base with the client.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of data base design including :
  - database management system (DBMS) fundamentals particularly during the design phase
- describe the functions and features of a database
- describe logical data modelling
- outline object-model design concepts related to:
  - developing data structures
  - development of a prototype
  - queries
  - screens
  - reports
- explain the physical design concepts in relation to a prototype
- recognise and describe run-time facilities related to implementing a live database and operation of a prototype
- describe and apply structured query programming language (SQL).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- industry software packages
- business requirements and strategy
- database design documentation
- database software
- database programming language.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTDBS501 Monitor and improve knowledge management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and improve a knowledge management system.

It applies to individuals who are knowledge engineers required to support and maintain an existing knowledge management system.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Investigate the knowledge management system	1.1 Review the structure of the existing knowledge management system, and develop an understanding of its operation 1.2 Interview the client and staff to determine information requirements 1.3 Identify frequently requested information 1.4 Create a structure for organising that information 1.5 Document the structure and forward to the appropriate person for approval
2. Create a knowledge management system	2.1 Retrieve the identified information 2.2 Organise information to follow the approved structure 2.3 Document the information structure
3. Distribute and monitor knowledge management system documentation	3.1 Distribute knowledge management system documentation to the client and staff 3.2 Gather feedback from the client and staff, and incorporate into improving systems and processes 3.3 Monitor the use of the knowledge management system to determine its effectiveness 3.4 Make changes to the knowledge management system 3.5 Make knowledge management system documentation available 3.6 Implement and monitor process improvements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 3.2, 3.6	• Recognises and interprets textual information to determine client information requirements
Writing	1.4, 1.5, 2.2, 2.3	• Records key information resulting from data gathering, issues and prepares documentation using basic punctuation, correct spelling, clear and instructional language
Oral Communication	1.2, 1.5, 3.1, 3.2, 3.6	• Obtains information by listening and questioning, and participates in a verbal exchange using detailed and clear language to articulate and confirm requirements
Interact with others	3.1, 3.2	• Participates in complex formal and informal conversations relevant to own role, initiating and taking the lead where appropriate in the context of gathering information and feedback from the client and staff
Get the work done	All	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against the agreed criteria • Understands key principles and concepts underpinning the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS501 Monitor and improve knowledge management system	ICADBS501A Monitor and improve knowledge management system	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTDBS501 Monitor and improve knowledge management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor existing knowledge management systems
- implement strategies to improve a new, or existing, knowledge management system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline current practices for information management within an organisation
- identify the information sources available within an organisation
- recognise current knowledge management systems
- explain database structures and their construction
- outline procedures for monitoring and reviewing knowledge managements systems.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- industry software packages
- organisational databases
- information requirements
- information repositories
- current knowledge management system(s).

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTDBS502 Design a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish client needs and technical requirements and to design a database that meets those requirements.

It applies to individuals employed as database administrators and designers who are required to design databases.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine database requirements	1.1 Meet with the client, and conduct a user-needs analysis, to determine database functionality 1.2 Analyse the results of a user-needs analysis to identify technical requirements 1.3 Develop a conceptual model of the database 1.4 Submit the conceptual model to the client for review 1.5 Evaluate client feedback and make changes as required
2. Develop a logical data model	2.1 Identify the attributes and determine the data types 2.2 Undertake the normalisation of attributes 2.3 Develop an entity-relationship (ER) diagram in order to clarify the cardinality of relationships 2.4 Document attributes, normalised data, and the ER diagram 2.5 Forward documentation to the client for confirmation
3. Design the data structures	3.1 Confirm primary and foreign keys for tables 3.2 Review client business rules 3.3 Identify the referential integrity constraints 3.4 Establish database management system constraints and incorporate into database design 3.5 Develop the validation rules for data 3.6 Design indexes and develop the data dictionary 3.7 Document the database design
4. Design queries, screens and reports	4.1 Design the user interface for database, including menus, input screens and outputs 4.2 Design queries, based on requirements 4.3 Design output reports, based on requirements 4.4 Compare the physical design with the conceptual model, or user-needs analysis 4.5 Incorporate changes as required
5. Design access and	5.1 Review the business security plan as a basis for

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ELEMENT	PERFORMANCE CRITERIA
security systems	commencing the access and security design 5.2 Design the password and access system for the database 5.3 Identify multiple-user requirements 5.4 Develop client access profiles using the client business model
6. Confirm the database design	6.1 Identify the database backup and recovery requirements 6.2 Develop and document the database backup and restore procedures 6.3 Submit the database, and documentation, to the client for final approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.5, 2.1, 3.2, 3.3, 4.4, 5.1, 6.1	• Interprets textual information obtained from a range of sources and determines how content may be applied to requirements
Writing	1.3, 2.3, 2.4, 3.7, 6.2, 6.3	• Develops content in a manner that supports the purposes and format of the requirements using appropriate structure, layout and specialised technical and programming language
Oral Communication	1.1, 1.4, 1.5, 2.5, 3.2, 5.1, 6.3	• Uses listening, questioning and summarising techniques to identify needs, and uses specific and clear language when engaging with others
Numeracy	3.4, 4.1, 4.3, 4.4	• Makes measurements and performs calculations for work layout, determine field lengths and table size and estimate database size
Get the work done	All	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks, identify and evaluate alternative strategies and resources • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against the agreed criteria • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS502 Design a database	ICADBS502A Design a database	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria	Equivalent unit

Links

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Assessment Requirements for ICTDBS502 Design a database

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and confirm client requirements for a database application
- design database elements including:
  - structure
  - indexes
  - queries
  - screens
  - reports
- design secure access to the database
- confirm final database design with the client.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the process of data analysis, particularly in determining data types and data structures, query and report design
- describe the data modelling related to developing the conceptual data model
- explain how data redundancy is identified
- describe database management system (DBMS) fundamentals, particularly during the design phase
- explain encryption and authentication as these apply to database security features
- outline the functions and features of data types, and data structures
- describe the functions, and features, of databases
- describe logical design concepts, particularly those related to designing data structures, queries screens and reports
- outline the object model design concepts, particularly those related to designing data structures, queries, screens and reports
- explain the term ‘scalability’ as it applies to databases.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- current industry accepted database software
- network or other system for remote or multi-user access
- business requirements
- computer-aided software engineering (CASE) or diagramming software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDBS503 Create a data warehouse

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, develop and implement a data warehouse within an organisation.

It applies to individuals who are senior database staff required to provide data warehouse functionality for their organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the required data and sources	1.1 Identify the required organisational data, according to the enterprise's knowledge management strategy 1.2 Identify the subject areas, according to the business processes and the required enterprise data 1.3 Explore the operational data, define the warehouse sources, and record the outcomes 1.4 Develop the warehouse source specifications, according to the existing data tables and files
2. Determine warehouse operational steps and processes	2.1 Develop the warehouse targets, according to the business processes and the required enterprise data 2.2 Identify the warehouse agents, according to the system's configuration 2.3 Identify and develop, warehouse steps and processes
3. Design and develop warehouse features	3.1 Design and develop the warehouse user interface, according to the principles of user interface design 3.2 Develop and implement the warehouse security strategy, according to the enterprise's security plan 3.3 Identify dimension tables and fact tables, according to the required enterprise data 3.4 Develop the warehouse information catalogue, according to the enterprise's knowledge management strategy
4. Test and implement the data warehouse	4.1 Test data the warehouse against the business requirements, to ensure that iterations meet the business objectives 4.2 Recommend changes to business processes, to ensure compatibility with the data warehouse and the knowledge management strategy 4.3 Implement the data warehouse 4.4 Establish an ongoing maintenance schedule to keep the system efficient 4.5 Benchmark and document the performance level of the data warehouse
5. Finalise work processes	5.1 Arrange for users to have ongoing training in the data

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ELEMENT	PERFORMANCE CRITERIA
	warehouse 5.2 Validate the test results 5.3 Obtain sign-off for the data warehouse

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.2, 2.3, 3.3, 4.5, 5.2	• Critically analyses documentation from a variety of sources and records, and consolidates, information to determine requirements
Writing	1.3, 2.1, 2.3, 3.1, 3.2, 3.4, 4.2, 4.4, 4.5, 2.2, 5.3	• Collates and compiles data and text, using clear and detailed language, in order to convey specific information, requirements and recommendations
Oral Communication	1.1-1.3, 2.1, 2.3, 4.2, 4.3, 5.1-5.3	• Uses effective listening, questioning and summarising skills, to articulate requirements and convey information clearly
Numeracy	4.5	• Perform mathematical calculations to analyse the cost benefit of the data warehouse project
Navigate the world of work	3.2, 3.4, 4.1, 4.2	• Recognises and follows, explicit and implicit protocols, and meets the expectations associated with own role when obtaining sign-off for the data warehouse • Modifies or develops organisational policies and procedures, to comply with legislative requirements and organisational goals
Get the work done	All	• Develops plans to manage relatively complex, non-routine tasks, with an awareness of how they may contribute to the longer-term operational and strategic goals • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of constraints into account • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options, against the agreed criteria • Uses and investigates new digital technologies and applications to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS503 Create a data warehouse	ICADBS503B Create a data warehouse	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS503 Create a data warehouse

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare the specifications for a data warehouse, from a range of organisational information
- design a data warehouse system that reflects the current, and future, business specifications, and also the business's knowledge management strategy
- test the data warehouse system
- implement the data warehouse design.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the functions and features of:
  - data warehousing and data mining
  - dimension tables and fact tables
  - various steps and processes, including transformer steps, program steps, structured query language (SQL) steps, and user-defined program steps
  - subject areas, warehouse sources and warehouse targets
  - warehouse agents and agent sites
- outline the business operating systems related to the data sources
- describe the decision support systems related to the knowledge management strategies
- define the parameters for a security plan
- outline the system's configuration parameters
- describe the key features of "Big Data" including:
  - data access speeds and processing
  - the information handled by large corporations
  - distribution, via the cloud, across the database servers.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- industry software packages
- the business requirements
- computers configurable as information servers
- the enterprise's knowledge management strategy
- internet connectivity tools
- the local area network (LAN), with a relational database management system (DBMS)
- proxy server software
- specialised internet security software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDBS504 Integrate database with a website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure the database is integrated with a website.

It applies to individuals employed as web developers who are responsible for creating data-driven web applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Connect to the database	1.1 Identify site data needs from the technical requirements 1.2 Connect to the database from a web application using a web development language
2. Retrieve data from database and display on web pages	2.1 Retrieve data using structured query language (SQL) 2.2 Display the data in the most appropriate control 2.3 Format the data so that it is displayed in the most effective way
3. Update the database data from user input	3.1 Update the existing data stored in the database with user-supplied input 3.2 Insert the data in the database with user-supplied input 3.3 Delete the data stored in the database 3.4 Validate the data and check for errors

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1, 3.3, 3.4	• Interprets textual information from the sources in order to identify relevant and key information
Writing	1.2, 2.3, 3.1, 3.2	• Writes and edits computer input data, code and technical data, ensuring correct syntax and accuracy
Get the work done	All	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, and establishes the criteria for deciding between different options • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world, and uses these to connect to a database from a web application, retrieving, displaying and updating data

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalent status
ICTDBS504 Integrate database with a website	ICADBS504A Integrate database with a website	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDBS504 Integrate database with a website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- access database using a web development language
- retrieve and display web-based data
- update web-based data.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe a database structure
- outline internet technology as it relates to the use of databases
- identify and apply programming control structures, including object-oriented programming and structured query language (SQL)
- explain web programming concepts, including:
  - authentication and web security
  - hypertext transfer protocol (HTTP)
  - session management
  - defining the principles of stateless programming.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment
- industry software packages
- the requirements documentation
- a web server
- a database
- the web development environment
- browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDBS601 Build a data warehouse

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, develop and implement a data warehouse within an organisation.

It applies to individuals managing a knowledge management team, or works in a senior role in such a team with line management responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm the database design	1.1 Review the database design document, including the data structures, queries, reports and user interface 1.2 Identify any possible "Big Data" applications 1.3 Compare the database access and security design, with the business security plan
2. Identify the required data and sources	2.1 Identify the required data, with reference to the enterprise's knowledge management strategy 2.2 Identify subject areas, with reference to the business processes and the required data 2.3 Explore operational data, define the warehouse sources and record the outcomes 2.4 Develop the warehouse source specifications, with reference to the existing data tables and files
3. Determine warehouse operational steps and processes	3.1 Develop the warehouse targets, with reference to the business processes and the required data 3.2 Identify the warehouse agents, according to the system's configuration 3.3 Identify and develop, warehouse steps and processes
4. Design and develop the warehouse features	4.1 Design and develop the warehouse user interface, with reference to the principles of user interface design 4.2 Develop and implement the warehouse security strategy, according to the enterprise's security plan 4.3 Identify dimension tables and fact tables, with reference to the required data 4.4 Cost the technology requirements for the implementation of the warehouse security strategy, and include them in e-business budgeting 4.5 Develop a warehouse information catalogue, with reference to the enterprise's knowledge management strategy
5. Test and implement the data warehouse	5.1 Test the data warehouse against the business requirements, to ensure that iterations meet the business objectives 5.2 Recommend changes to business processes, to ensure

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ELEMENT	PERFORMANCE CRITERIA
	compatibility with the data warehouse and the knowledge management strategy 5.3 Implement the data warehouse 5.4 Establish an ongoing maintenance schedule in order to keep the system efficient 5.5 Benchmark and document, the performance level of the data warehouse
6. Finalise work processes	6.1 Arrange for users to have ongoing training in the data warehouse 6.2 Validate the results 6.3 Obtain sign-off for the data warehouse

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.3, 6.2	• Interprets the textual information obtained from a range of sources, and determines how the content may be applied to the requirements
Writing	2.4, 3.1, 3.3, 4.2, 4.5, 5.5	• Develops content in a manner that supports the purposes and format of the requirements, using the appropriate structure, layout, and specialised technical and programming language
Oral Communication	2.1, 2.2, 6.1, 6.3	• Uses listening, questioning and summarising techniques to identify needs, and uses specific and clear language when engaging with others
Numeracy	4.4	• Uses the relevant information in completing cost benefit analyses
Navigate the world of work	2.1, 2.2, 4.2, 4.5	• Works autonomously, making high-level decisions to achieve, and improve, organisational goals • Takes a lead role in the development of organisational goals, roles and responsibilities • Develops and implements strategies that ensure that the organisational policies, procedures and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures, and adherence to legislative requirements, in order to implement and manage change
Get the work done	All	• Develops plans to manage relatively complex, non-routine tasks, with an awareness of how they may contribute to longer-term operational and strategic goals • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of constraints into account • Uses systematic, analytical processes in complex non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options, against the agreed criteria • Uses a systematic process to identify possible solutions to a difficult problem • Demonstrates a sophisticated understanding of the principles, concepts, language and practices

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		associated with the digital world, and uses these to build a data warehouse

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS601 Build a data warehouse	ICADBS601B Build a data warehouse	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTDBS601 Build a data warehouse

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review and document the database's design, and security, for the current and future business requirements
- identify and document, the specifications for the storage of different types and sources of data
- develop a cost benefit analysis for a data warehouse
- design, develop, test, and implement a data warehouse that reflects the business's knowledge management strategy
- document the operation of the data warehouse.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the business operating systems related to the data sources
- outline database management system (DBMS) fundamentals, in order to facilitate the extraction of data
- define "Big Data" and summarise its use and management, in the corporate sector
- identify and apply, the decision-support systems related to knowledge management strategies
- explain encryption and authentication as they apply to database security features
- outline the functions and features of dimension tables and fact tables
- explain the installation and use of proprietary software
- explain the logical database model knowledge needed to facilitate data extraction
- describe the relationship between databases and data warehouses
- define the levels of technical documentation required for newly developed data management systems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- industry software packages
- data in a DBMS
- a data-warehousing tool.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDBS602 Develop a knowledge management strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop a knowledge management strategy for an organisation. It includes analysing existing systems, determining requirements, and developing a strategy to meet those requirements.

It applies to individuals who may be managing a knowledge management team, or who are working in a senior role with line management responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse existing knowledge management arrangements	1.1 Identify existing arrangements for the capture and use of knowledge, and information, from both internal and external sources 1.2 Distinguish between arrangements for managing knowledge and information management 1.3 Analyse the importance of knowledge management concepts in the identified organisation 1.4 Evaluate the effectiveness of existing procedures and systems in meeting the needs of clients, organisational aims, objectives, and standards 1.5 Identify the improvements in the organisation's strategic use of knowledge, and prepare a cost-benefit analysis
2. Evaluate knowledge management options	2.1 Investigate the methods for capturing and using knowledge held by people within a business, and identify and evaluate barriers to their use 2.2 Evaluate knowledge management software and make recommendations regarding its usefulness, and likely benefit, to the organisation 2.3 Investigate incentives and reward systems to support knowledge management for their relevance to a business 2.4 Determine non-technical business requirements for maintaining and accessing an integrated knowledge database, according to organisational requirements
3. Develop a knowledge-management strategy	3.1 Develop a knowledge management strategy in consultation with staff for the capture and strategic use of organisational knowledge 3.2 Design business processes to support knowledge management, according to the organisation's knowledge management strategy, and budget 3.3 Plan an executive support system as part of the knowledge management strategy, to improve managerial decision-making according to organisational requirements 3.4 Cost the technology requirements for the implementation of the strategy, and include this costing in knowledge management budgeting

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ELEMENT	PERFORMANCE CRITERIA
	3.5 Design, or redesign, processes for a periodic review of knowledge management within the business in order to ensure ongoing efficiency and effectiveness 3.6 Ensure that the knowledge management strategy meets the organisational requirements identified in its overall business plan, and knowledge management strategy

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.4, 3.1, 3.2	• Interprets textual information obtained from a range of sources, and determines how this content may be applied to requirements
Writing	1.5, 2.2, 3.1	• Develops content in a manner that supports the purposes and format of the requirements using appropriate structure, layout and specialised technical language
Oral Communication	1.1, 1.3, 1.4, 2.1-2.4, 3.1, 3.4	• Uses listening, questioning and summarising techniques to identify needs, and uses specific and clear language when engaging with others
Numeracy	1.5, 3.4	• Uses mathematical formulas and calculations to perform a cost-benefit analysis
Get the work done	All	• Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences, and consider implementation issues and contingencies • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options, and seeking input and advice from others before taking action • Experiments with the possibilities of new systems, devices, and applications before conducting a more sophisticated analysis of benefits, costs and risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS602 Develop a knowledge management strategy	ICADBS602A Develop a knowledge management strategy	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria	Equivalent unit

Links

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Assessment Requirements for ICTDBS602 Develop a knowledge management strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- choose a knowledge management option that meets organisational requirements
- develop a knowledge management strategy able to be implemented.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the importance of knowledge management in contemporary organisations
- differentiate between the culture of the business versus traditional business models
- explain database design concepts
- identify both internal and external sources of information
- outline legal, ethical and security issues relating to knowledge management
- explain records management principles
- identify relevant government legislation that may affect business operation, especially in regard to:
  - workplace health and safety (WHS)
  - environmental issues
  - equal opportunity
  - industrial relations
  - anti-discrimination
- describe the structures of organisations and their business goals.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- industry software packages
- sample organisations suitable for the implementation of knowledge management (including business plans).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDBS603 Determine suitability of database functionality and scalability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify the current and future business requirements for a database.

It applies to individuals with senior system-operations or line management responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Database

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine context of the business need or problem	1.1 Develop the database objectives and identify the expected outcomes to be achieved 1.2 Document the database problem
2. Gather information	2.1 Analyse the database in order to identify the business rules, entities and relationships 2.2 Identify the existing and proposed business models 2.3 Identify any possible Big Data applications
3. Determine the database functionality	3.1 Document the existing database and the environment 3.2 Confirm database functionality with the client
4. Identify scalability and functionality	4.1 Identify the reserve, and long-term capacity, of the database 4.2 Identify the implications for the system's architecture, data models, data structures, hardware and software 4.3 Identify the requirements for scalability 4.4 Compare the functionality and scalability features of the database 4.5 Determine and document any gap between the features
5. Prepare the database functionality and scalability report	5.1 Document the functionality and scalability of the database 5.2 Submit the report to the client for review

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 2.3, 3.2, 4.1-4.5	• Critically analyses complex documentation from a variety of sources, and consolidates information relating to specific criteria, to determine the requirements
Writing	1.1, 1.2, 3.1, 5.1, 5.2	• Develops content in a manner that supports the purposes and format of the requirements, using the appropriate structure, layout and specialised technical language
Oral Communication	1.1, 2.2, 3.2, 4.1-4.3, 5.2	• Establishes and maintains, complex and effective communications in a broad range of contexts, using listening, questioning and summarising techniques to identify needs, and uses specific and clear language when engaging with others
Get the work done	1.1, 1.2, 2.3, 4.1, 4.2, 4.3, 4.4, 4.5	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data, and seeks feedback, to improve plans and processes • Makes high-impact decisions in a complex and diverse environment, using input from a range of sources • Identifies the key factors that impact on decisions and their outcomes, drawing on experience, competing priorities and decision-making strategies, where appropriate • Explores and incubates, new and innovative ideas through unconstrained analysis, and critical thinking, to develop and improve the organisation's goals • Uses digital technologies to manage the business operations, and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDBS603 Determine suitability of database functionality and scalability	ICADBS603B Determine suitability of database functionality and scalability	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTDBS603 Determine suitability of database functionality and scalability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document a clear statement of business expectations and needs, including critical business requirements
- examine the scalability, and functionality, of a database in light of future growth
- determine database functionality and scalability system requirements
- present the findings in a report to the client.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the architecture of the network in which the database resides
- identify and explain, the code of ethics relevant to the computing industry in Australia
- identify the common system hardware related to the client, server and database architecture
- explain the concept of data modelling
- outline the functions and features of databases
- define "Big Data", and explain its implication for database design and functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the database field of work, and include access to:

- equipment and materials
- industry software packages
- a database management system (DBMS)
- a sample database and data.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTDMT401 Create visual design components for digital media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create visual design components for interactive media, using industry-standard authoring tools.

It applies to individuals working in digital media, under the direction of industry standards and supervision, who are responsible for producing visual design components for digital media.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify commonly used visual design components for games and interactive media	1.1 Obtain the project brief and documents 1.2 Identify the features of the visual design components for interactive media 1.3 Discuss the design considerations for designing an interactive visual design component
2. Identify the graphics software packages used for visual design	2.1 Identify and review the range of industry-standard graphics software available 2.2 Assess the software related to the visual design component requirements 2.3 Discuss the technical specifications for rendering and editing processes 2.4 Select the graphics software package
3. Use graphics software	3.1 Run the graphics software and become familiar with the interface 3.2 Create new files and organise a file structure 3.3 Learn the required tools and features used to create visual design components
4. Create the visual design components for an interactive media	4.1 Design the visual components of a basic graphical user interface (GUI) for interactive media 4.2 Consider the interactive elements of GUI 4.3 Document the design 4.4 Use graphics software to create visual design components to be used for GUI
5. Evaluate the implementation	5.1 Demonstrate the implementation to relevant personnel 5.2 Evaluate the usability of design components 5.3 Reflect on possible changes to improve the visual design and interactivity of components

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 2.2, 3.1, 3.3, 4.1, 4.2, 5.2, 5.3	• Analyses and comprehends documentation, images, briefs, instructions, technical and conceptual information from a range of sources, in order to inform the implementation of visual design components for interactive media
Writing	3.2, 4.3	• Uses industry specific language to create files and file structures • Records technical information noting output of investigations and discussions
Oral Communication	1.3, 2.3, 5.1, 5.3	• Articulates complex designs and graphical requirements to others in collaborative discussions, using listening and questioning techniques to check, evaluate and confirm design requirements
Numeracy	1.2, 2.1, 2.3, 3.1, 3.3, 4.1, 4.2, 5.2	• Uses both formal and informal, oral and written language to convey knowledge and evaluation of technical design components
Interact with others	1.3, 2.3, 5.1-5.3	• Selects and uses appropriate conventions and protocols to communicate with co-workers and others in a range of work contexts
Get the work done	1.1-1.3, 2.1-2.4, 3.1-3.3, 4.1-4.4, 5.2, 5.3	• Takes responsibility for planning and organising own workload • Analyses available information to make informed decisions • Reflects on outcomes to identify opportunities for improvement • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDMT401 Create visual design components for digital media	ICADMT401A Create visual design components for digital media	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTDMT401 Create visual design components for digital media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- demonstrate original and innovative approaches to the creative development of a graphical user interface (GUI)
- demonstrate how to maintain the integrity of the design brief
- produce concept art and design specifications for splash screens, start screens, and game field screens consistent with a design brief
- construct technical specifications for the visual design components, and overall usability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain basic programming techniques
- identify the technical constraints that hardware imposes on software development, graphics requirements, code development and creative visual design
- identify the techniques for applying concept development skills
- identify the techniques for applying concept visualisation skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media field of work, and include access to:

- computer hardware
- software
- file storage
- the internet for research purposes
- copyright and intellectual property legislation
- workplace health and safety (WHS) legislation
- enterprise policies.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTDMT402 Produce interactive animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the, skills and knowledge required to create animation for a range of applications, including web pages, e-learning, simulations and advertisements.

It applies to individuals who possess a sound knowledge of digital media and who may either, provide support within a team, or be independently responsible for the design and development of animations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse project requirements	1.1 Determine the necessary dynamic functionality of the animation to be included inside a web or other interactive document 1.2 Determine the appropriate language to achieve that functionality 1.3 Determine and evaluate current requirements for the specified application
2. Design animations	2.1 Design animations to enhance the web page, and to meet requirements 2.2 Design animations to meet the specifications for sound and interactive functions 2.3 Design animations that will add to the overall professionalism, or entertainment value, of an application
3. Produce animations	3.1 Produce animations for web pages and other media 3.2 Research and experiment with a range of animation techniques for enhancing the user experience 3.3 Produce web animations for a website that enhance the overall professionalism or entertainment value of the website 3.4 Test and debug scripts against the required functionality and repeat until correct
4. Publish animations	4.1 Publish the animations in an acceptable format 4.2 Incorporate the animations into a hypertext markup language (HTML) page 4.3 Complete the documentation and submit it to the appropriate person for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 3.2	• Researches technical and conceptual information from a range of sources to identify, and evaluate, the appropriate design elements, and animation techniques for a specific audience
Writing	2.1-2.3, 3.1-3.4, 4.1-4.3	• Develops material according to internal standards using the appropriate language, layout and structure for a specific audience, to effectively and creatively convey animations in the appropriate format
Oral Communication	4.3	• Conveys information clearly and politely, and involves others in collaborative discussions using listening and questioning techniques and interpersonal skills
Numeracy	3.4	• Uses a logical sequence of steps to identify and solve functional problems relating to animation
Interact with others	1.3, 2.1	• Selects and uses appropriate conventions, and protocols, when communicating with co-workers and others in a range of work contexts
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.4, 4.1-4.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these, applying problem-solving processes in determining a solution • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDMT402 Produce interactive animation	ICADMT402A Produce interactive animation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDMT402 Produce interactive animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and create interactive animation, following current industry standards
- design and create interactive animation to enhance the professionalism and the entertainment value of a website.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the internet technology used to inform choice of the scripting type
- describe the principles of analysis and design
- explain programming control structures and object-oriented programming, including:
  - buttons
  - scripting to go to uniform resource locators (URLs)
  - scripting to jump to different parts of the animation
  - scripting using the programming language
- explain web-animation programming concepts, including:
  - acceptable formats for importing assets
  - component libraries
  - cross-browser issues
  - importing and exporting libraries
  - inserting published work to a hypertext markup language (HTML) or to an extensible hypertext markup language (XHTML) page
  - internet animation player statistics
  - masking
  - movements and automated movements
  - publishing finished work in an acceptable web format
  - shape animation and manipulation
  - symbols
  - text manipulation
  - transparencies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- the internet and browser access.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTDMT403 Produce and edit digital images

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce and edit digital images using a range of digital media technologies.

It applies to individuals who possess sound knowledge of digital media, who may provide support within a team or who may be independently responsible for producing editing, enhancing and manipulating digital images.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess digital camera qualities	1.1 Assess camera software compatibility with hardware systems and select appropriate software for the production 1.2 Select a pixel resolution on the camera to achieve the required quality and resolution of outcome 1.3 Check the storage capacity of the camera to identify the number of images required to be captured 1.4 Assess camera features suitable to the quality, and use of, the digital images required 1.5 Handle and store lithium batteries according to work health and safety (WHS) requirements
2. Photograph an image	2.1 Consider camera features, when operating the camera, to ensure that the capture of the image meets production requirements 2.2 Load and operate the camera, according to the manufacturer's specifications, and as appropriate to the quality of image to be photographed 2.3 Capture digital images using designated file formats
3. Edit a digital image	3.1 Ensure the correct use of digital image software, including entering and exiting the selected software 3.2 Create and store digital image files on a computer according to software procedures 3.3 Enhance, crop and alter digital images electronically, to deliver the required image 3.4 Check digital images for suitability and compliance with specifications 3.5 Save and retrieve digital images using designated file formats 3.6 Assess digital images for the delivery mode
4. Incorporate digital images into an interactive sequence	4.1 Create graphics that incorporate the principles of design using digital image software 4.2 Edit, enhance, amend and save digital images using digital image software 4.3 Combine digital images into a designated interactive

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ELEMENT	PERFORMANCE CRITERIA
	sequence 4.4 Integrate the digital images into a designated interactive sequence 4.5 Evaluate the outcome for purpose, visual impact and effectiveness

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.3, 3.1-3.6, 4.1, 4.2	• Interprets and analyses complex information in a range of texts, critically evaluating numerical and textual information to identify compatibility, comparing technical specifications and solutions to new and emerging issues
Writing	2.3, 3.1, 3.2, 3.5, 4.2, 4.5	• Develops material and resources utilising knowledge of spelling, grammar, appropriate structure and layout, to organise and record information, and evaluates digital image details accurately using specific language and format required for the audience
Numeracy	1.2,1.3, 4.1	• Uses numeracy to identify the appropriate technical specifications to achieve the desired outcome • Uses a combination of both formal and informal mathematical language involving knowledge of unity, scale, perspective and balance when considering creating graphics
Get the work done	1.1-1.5, 2.1- 2.3, 3.1-3.6, 4.1-4.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these, applying problem-solving processes in determining a solution • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDMT403 Produce and edit digital images	ICADMT403A Produce and edit digital images	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDMT403 Produce and edit digital images

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- demonstrate the operation of a digital camera in order to capture a range of images
- assemble the appropriate tools and procedures required to produce digital images
- demonstrate using digital imaging software to prepare high quality digital images that satisfy a range of customer or business requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the functions and features of a range of delivery platforms
- describe digital photographic techniques
- explain the basic principles of communication through visual design
- describe the implications of technology connectivity
- explain work health and safety (WHS) requirements for the use of cameras, and computers, and the handling and disposing of lithium batteries
- explain procedures for customer and business liaison
- describe the industry standards relevant to digital images.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media field of work, and include access to:

- special purpose tools and equipment
- materials and industry software packages
- a digital camera
- industry standard graphics software
- copyright information.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTDMT501 Incorporate and edit digital video

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to incorporate, and edit, digital video into interactive media presentations.

It applies to individuals who possess a sound knowledge of digital media, are independently responsible for the workflow process and provide support and supervision within a team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and describe the formats of digital video	1.1 Determine the distinguishing features and uses of a range of digital video software 1.2 Select the current video-editing software appropriate to a range of given outcomes 1.3 Determine the limiting factors of computer hardware on video production for a specified job 1.4 Determine the differences of image quality and image size, required to deliver the desired outcome 1.5 Analyse the formats employed to create a given computer video sequence for a specified outcome
2. Design the digital video	2.1 Assess and select appropriate digital video software for the job 2.2 Use digital video-editing software to combine video assets 2.3 Control variations in video frame rates, as required for the job to be undertaken 2.4 Apply time-stamping techniques to the video frames, appropriate for the job to be undertaken 2.5 Save the digital video using the appropriate file techniques
3. Edit the digital video	3.1 Edit single and multiple video tracks to achieve a defined outcome 3.2 Join the multiple tracks of a digital video, according to specifications 3.3 Employ digital effects to modify and integrate digital video tracks, according to specifications 3.4 Apply time encoding to single and multiple-edited digital video tracks, according to specifications 3.5 Insert a video track into an interactive media production, according to specifications
4. Present a digital video sequence	4.1 Test the digital video, and combine with other digital imaging, sound, visual effects and animation to create an interactive media presentation 4.2 Save the digital media presentation, including the video, and

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ELEMENT	PERFORMANCE CRITERIA
	present to the client or customer

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1, 4.1	• Integrates a range of texts and organisational information to critically analyse data and evaluate text in order to determine effective engagement methods, and to monitor the effectiveness of systems for the audience and environment
Writing	2.5, 4.2	• Develops material and resources utilising knowledge of spelling, grammar, appropriate structure and layout, to organise and record information and feedback in a sequential manner for client and staff engagement, as well as internal reference
Oral Communication	4.2	• Participates in verbal exchanges of ideas that elicit views, opinions and feedback from others, using appropriate professional techniques and interpersonal skills to effectively, and respectfully, convey information and establish rapport
Numeracy	1.2, 1.4, 3.1-3.5	• Interprets mathematical information embedded in technical and conceptual information
Get the work done	1.1-1.5, 2.1-2.5, 3.1-3.5, 4.1-4.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Responds intuitively to problems requiring immediate resolution, drawing on past experiences in order to focus on the cause of a problem rather than the symptom • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine and non-routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTDMT501 Incorporate and edit digital video	ICADMT501A Incorporate and edit digital video	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTDMT501 Incorporate and edit digital video

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce, visualise and interpret creative concepts for digital video
- demonstrate application of the principles of video-editing and production techniques
- design, compile, edit and test the digital interactive media incorporating video.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain contemporary video software
- explain the importance of and actions required to ensure continuity during the editing process
- outline editing conventions
- identify electronic digital language and other terminology
- explain the purpose of using montage as part of a presentation, and the impact of sound and visual effects
- describe principles of video production and formats
- describe the types of cutting
- explain video-editing and post-production techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media field of work, and include access to:

- special purpose tools, equipment, and materials
- industry software
- the internet
- copyright and intellectual property legislation
- workplace health and safety (WHS) legislation
- enterprise policy.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM301 Apply simple modelling techniques

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, and refine, 3-D models using simple modelling techniques and appropriate software.

It applies to individuals who support the design, development, and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clarify work requirements	1.1 Clarify the requirements for, and purpose of, 3-D digital modelling techniques and refer to the production documentation, WHS requirements and roles of project team members 1.2 Clarify work-flow sequences in consultation with the relevant personnel, to ensure that production schedule deadlines are met 1.3 Select the software that best suits the type of production and delivery platform for which simple 3-D modelling techniques are being applied 1.4 Gather and analyse reference materials to help with the application of modelling techniques
2. Apply simple 3-D modelling techniques	2.1 Apply simple 3-D modelling techniques to create 3-D models 2.2 Use software features to block out models in order to determine the correct proportions related to reference materials 2.3 Manipulate software features to apply basic lighting and shaders to the models, as required 2.4 Ensure that the topology of the models allows for appropriate deformation, as required 2.5 Progressively refine, and check, the integrity of the models until they meet design requirements 2.6 Submit models to the relevant personnel for comment regarding whether production requirements have been met, and make final adjustments as required 2.7 Render and output the models in the required format, and submit to the relevant personnel by agreed deadlines 2.8 Make backup copies of files and complete workplace documentation, according to enterprise procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.4, 2.6	• Interprets documentation, diagrams, designs, objects and images to identify relevant information • Recognises and comprehends signs, symbols, pictures, jargon, abbreviations, computer generated text, numbers and letters, necessary to operate modelling applications software
Writing	2.8	• Completes the documentation necessary for work tasks and reporting according to requirements
Oral Communication	1.1, 1.2, 1.3, 1.4, 2.6	• Uses industry terminology to clarify requirements and obtain information • Listens and responds to instructions, answers to questions and feedback
Numeracy	2.1, 2.2, 2.3, 2.4, 2.5, 2.7	• Adds, subtracts, multiplies and divides whole numbers, and decimals, when manipulating measurement, scale, ratio and coordinates in the development of models • Structures timeframes to work to deadlines
Navigate the world of work	2.8	• Complies with explicit organisational procedures
Get the work done	1.1-1.4, 2.1-2.8	• Makes routine decisions and implements standard procedures for routine tasks • Uses key features of specific digital systems and tools to complete routine tasks • Uses creativity and initiative in design • Understands the importance of secure information in relation to own work, and takes responsibility for data integrity and management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM301 Apply simple modelling techniques	ICAGAM301A Apply simple modelling techniques	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
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Assessment Requirements for ICTGAM301 Apply simple modelling techniques

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- clarify 3-D modelling requirements
- create 3-D digital models that:
  - demonstrate the application of simple 3-D modelling techniques
  - demonstrate the efficient use of geometry and attention to detail
  - meet production documentation requirements
- work collaboratively with the other members of the design and development team
- meet deadlines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify 3-D digital model design techniques
- outline 3-D digital modelling techniques
- outline the stages in the production process, from the initial concept through to the finished product
- discuss the features of a range of delivery platforms
- discuss geometry as it applies to the creation of realistic 3-D digital models
- outline the issues and challenges of creating 3-D digital models
- outline work health and safety (WHS) standards, as they relate to working for periods of time on computers
- outline the roles and responsibilities of project team members in the relevant industry sector
- discuss the use of scale, form, weight and volume in the design, and development, of 3-D digital models
- discuss basic copyright issues associated with designing and creating 3-D models.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- the production documentation
- reference materials
- computer hardware
- industry software packages
- games engines
- file storage
- enterprise policy about WHS requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM302 Design and apply simple textures to digital art

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to assess, and select, textures and shaders to develop new textures and to apply them to digital art, including 3-D models.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clarify the design requirements, and plan the approach	1.1 Interpret the brief to clarify design, texture generation, and the delivery requirements in consultation with the client 1.2 Identify the design and technical constraints 1.3 Identify the software, media and file formats for digital imagery, texture production and manipulation 1.4 Identify the sequence of digital texturing activities in the production pipeline 1.5 Identify production workflow requirements, and develop the production pipeline to meet client requirements
2. Assess the existing textures and shaders for suitability	2.1 Establish the underlying surface characteristics of the 3-D model to be textured and shaded 2.2 Identify basic shaders and textures with surface characteristics 2.3 Identify suitable textures from the available texture libraries 2.4 Select shaders and textures for the assignment to model 2.5 Confirm that the selections are consistent with the brief and with client requirements
3. Determine shader attributes and assign to a 3-D model	3.1 Identify and select the attributes required to achieve the desired effects on 3-D models 3.2 Determine and confirm the requirements related to lighting and rendering 3.3 Use the appropriate methods and techniques to achieve the desired shading outcome
4. Acquire new textures	4.1 Identify the desired resolution for texture, prior to acquisition 4.2 Acquire textures from an online library 4.3 Capture real-world textures using digital means 4.4 Generate the texture, using art media, or digital paint software, and then save 4.5 Ensure that the resolution of the acquired texture meets resolution requirements

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ELEMENT	PERFORMANCE CRITERIA
5. Generate procedural textures and create a texture map	5.1 Assess the nature of the surface topology 5.2 Identify the suitable types of 3-D projection 5.3 Apply geometry where necessary 5.4 Use algorithms to simulate natural patterns, where required 5.5 Determine the texture-mapping method 5.6 Determine the projection-mapping method 5.7 Adjust the parameters to achieve desired effects
6. Apply the texture to model	6.1 Apply the texture to the model 6.2 Layer and enhance the textures to achieve the desired effects 6.3 Apply lighting to test the reaction of the textures 6.4 Apply the textures to lights, in order to achieve specified effects 6.5 Adjust the textures to achieve the final effects 6.6 Complete test renders, and confirm the outcome with the client
7. Finalise the design	7.1 Present test renders to the client for approval 7.2 Make technical or design adjustments consistent with the feedback and with budgetary constraints 7.3 Finalise shading and texturing 7.4 Save and archive files in agreed formats and repository

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.5, 5.1, 5.2	• Interprets and comprehends information in diagrams, designs, objects, and images • Recognises and comprehends signs, symbols, pictures, jargon, abbreviations, computer generated text, numbers and letters necessary to operate complex digital art software
Oral Communication	1.1, 1.2, 1.3, 1.4, 1.5, 2.5, 3.2, 6.6, 7.1	• Uses effective questioning and listening techniques, translating digital art terminology to plain English where necessary, to clarify client requirements and obtain information • Listens and responds to instructions and feedback to ensure that the finished result meets client requirements
Numeracy	3.3, 4.1, 4.5, 5.4, 5.7, 6.2, 6.3, 6.4, 6.5, 6.6, 7.2, 7.3	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other variables, in the application of texture to digital imagery • Adds, subtracts, multiplies and divides whole numbers and decimals to ensure that the project meets budgetary constraints
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.3, 4.1-4.5, 6.1-6.5, 7.2, 7.3	• Makes routine decisions and implements standard procedures for routine tasks • Uses creativity and initiative in design • Uses key features of digital systems and tools to complete routine tasks • Understands the importance of secure information in relation to own work, and takes responsibility for data integrity and management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM302 Design and apply simple textures to digital art	ICAGAM302A Design and apply simple textures to digital art	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM302 Design and apply simple textures to digital art

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- comprehend design requirements
- complete texturing and shading tasks according to brief requirements
- create and apply textures to digital art
- use and optimise software components for best performance
- adhere to system requirements related to file sizes and formats
- store completed file components to software and organisational requirements
- develop textured, shaded and rendered models
- integrate texturing activities into the overall production pipeline.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss camera textures and filters that can be used to achieve shading and texturing effects
- outline the features of software used for:
  - 3-D modelling
  - appropriate file sizes and formats
  - digital image manipulation
  - lighting
  - rendering
  - scanning
  - the scheduling of production activities
  - shading
  - texturing
- describe how to interpret design, texturing, and shading briefs
- discuss digital image capture, using cameras and scanners
- describe shader attributes and their optimisation
- describe shader and texture mapping, and projection
- discuss texturing and shading requirements for games.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- the appropriate computer hardware, software and peripheral devices
- models and scenes to be shaded and textured
- style shots
- rendering briefs or specifications
- the schedules.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM303 Review and apply the principles of animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to review the traditional animation process and design and produce 3-D animated sequences using modelling and animation software.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare the traditional animation process, and the sequence of its component parts	1.1 Describe the traditional animation process and its application in the production of quality 3-D animation 1.2 Describe the twelve principles of animation and their application in the production of quality 3-D animation 1.3 Identify the components that are essential to producing quality 3-D animation
2. Prepare scene layout and storyboarding techniques	2.1 Describe and demonstrate the scene layout techniques used in traditional animation 2.2 Describe and demonstrate the storyboarding techniques used in traditional animation
3. Nominate appropriate animation keys in a proposed animation sequence	3.1 Describe the key animation process 3.2 Produce sample key drawings 3.3 Identify the criteria used for the selection of animation keys 3.4 Select the appropriate animation keys in a proposed animation sequence
4. Create a short animation	4.1 Produce shot animation key drawings 4.2 Produce line image recordings of drawings 4.3 Create a short, animated sequence
5. Apply traditional animation principles to a 3-D animation	5.1 Produce a 3-D animated sequence, employing traditional animation principles, using 3-D modelling and animation software 5.2 Save and store, or archive, an animated sequence onto appropriate equipment or media

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.3, 5.1	• Recognises and comprehends a large range of signs, symbols, pictures, jargon, abbreviations, computer generated text, numbers and letters, necessary to operate complex animation software
Oral Communication	1.1, 1.2, 2.1, 2.2, 3.1	• Uses industry specific terminology to describe animation principles and processes
Numeracy	3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.2	• Uses positive and negative whole numbers, decimals, degrees and percentages when setting measurement, scale, coordinates, colour, shading, and other parameters in the development of animations
Get the work done	3.2, 3.4, 4.1-4.3, 5.1, 5.2	• Follows clearly defined instructions, monitors own progress and seeks assistance, when necessary • Makes routine decisions and implements standard procedures for routine tasks • Uses creativity and initiative in design • Uses key features of specific digital systems and tools to complete routine tasks • Understands the importance of secure information in relation to own work and takes responsibility for data storage

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Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Twelve principles of animation must include:	• anticipation • appeal • arcs • exaggeration • follow through and overlapping action • secondary action • slow in and slow out • solid drawing • squash and stretch • staging • straight ahead action and pose to pose • timing.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTGAM303 Review and apply the principles of animation	ICAGAM303A Review and apply the principles of animation	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM303 Review and apply the principles of animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create a short animation using traditional animation processes and a range of 3-D modelling and animation software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe a production brief
- discuss the use of animation keys
- discuss the application of traditional animation processes to digital animation
- outline the process for:
  - the development and recording of ideas
  - the production of 3-D animations
  - the production of a storyboard
  - the production of scene layout
  - filling media and paper-based assets
- outline the principles of animation
- discuss the scheduling of production components.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to appropriate computer hardware, software and peripheral devices.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM401 Produce an interactive game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce an interactive game using an industry standard authoring tool.

It applies to individuals who work in the game development industry and support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the game component assets	1.1 Obtain the project brief and documents 1.2 Identify the technical specifications and game-production assets, required to meet creative and production requirements 1.3 Discuss formats of assets, and issues of asset integration, with appropriate personnel 1.4 Save all digital assets in the appropriate format for inclusion, and store for retrieval 1.5 Determine the sequence for the development of a beta version prototype for testing game play 1.6 Create a schedule for production and testing 1.7 Determine the strategies for monitoring production progress against the schedule
2. Identify the capability of game-engine software and tools, and a make a selection	2.1 Identify and review the range of industry standard game-engine software and development tools available 2.2 Assess the software and tools related to specified game concepts and play requirements 2.3 Discuss considerations for the selection of game-engine software with relevant personnel, to ensure that the selection will meet specified outcomes 2.4 Select the game-engine software
3. Use game-engine software	3.1 Load a game engine, including sound and game play 3.2 Create a new file for the specified task, and name appropriately 3.3 Display and use the tools and features of the software relevant to the game production process 3.4 Create a custom code to achieve a unique function
4. Create a game-play sequence and prototype	4.1 Import and assemble game-play assets in the appropriate sequence, according to creative and technical requirements 4.2 Create and check the game-play elements, according to creative and technical requirements 4.3 Test and run the game-play sequence as a presentation, to ensure that the sequence meets creative, production and technical requirements

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ELEMENT	PERFORMANCE CRITERIA
	4.4 Export to the game engine and create a prototype 4.5 Save the file formats and identify for specified purpose
5. Evaluate the game prototype	5.1 Demonstrate the initial prototype to relevant personnel 5.2 Evaluate against criteria, including the achievement of a creative and user-friendly product 5.3 Discuss and agree on required changes 5.4 Assist, if required, in tests and user trials 5.5 Evaluate feedback from user trials 5.6 Confirm the endorsement from the relevant personnel to develop the prototype into a complete product
6. Transform prototype into a final proof-of-concept prototype	6.1 Make necessary changes, as indicated by user trials 6.2 Integrate all game elements, as required by specifications 6.3 Make final checks to ensure that all sequences conform to the navigation design 6.4 Save into specified storage systems

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.4, 5.2, 5.5	• Interprets and comprehends information in diagrams, storyboards, objects and images to identify appropriate software, resources, assets and user requirements • Recognises and comprehends signs, symbols, pictures, jargon, abbreviations, computer generated text, numbers, letters and coding syntax necessary to operate complex game engines
Writing	1.6, 3.2, 3.4, 4.5, 6.1, 6.4	• Uses clear, concise and accurate spelling, grammar, technical terminology and organisational document structures/layout to develop and communicate schedules, strategies and monitoring processes • Uses coding syntax, gaming engine syntax and organisational, labelling and naming conventions when developing interactive games
Oral Communication	1.1, 1.2, 1.3, 2.1, 2.3, 5.1, 5.2, 5.3, 5.4, 5.6	• Uses effective listening and open questioning techniques to elicit the view and opinions of others, and to obtain information • Participates in a verbal exchange of ideas and solutions, using detailed and clear language, to clarify and present information and strategies according to requirements and the audience
Numeracy	1.2, 1.3, 1.6, 2.2, 2.3, 3.4, 4.1, 4.2, 4.3, 4.4, 5.2, 6.1	• Uses positive and negative whole numbers, decimals, degrees and percentages when setting measurement, scale, coordinates, colour, shading, timing and other parameters in the development of interactive games
Interact with others	2.3, 5.3	• Cooperates with others and contributes to work practices where joint outcomes are required
Get the work done	1.1-1.7, 2.1-2.4, 3.1-3.4, 4.1-4.5, 5.1-5.6, 6.1-6.4	• Makes decisions and implements procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses creativity and initiative in design • Assesses, tests and modifies product to ensure that it meets client and technical requirements • Uses digital systems and tools to complete routine

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		tasks • Understands the importance of secure information in relation to own work and takes responsibility for data integrity, storage and management

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM401 Produce an interactive game	ICAGAM401A Produce an interactive game	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM401 Produce an interactive game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply a variety of strategies for game trialling and testing
- create a game using original and innovative approaches
- implement game development and production strategies
- maintain the integrity of the design brief and game design document.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe basic programming techniques
- discuss the capabilities, and constraints, of game engines
- identify current game-play hardware and software products
- outline the technical constraints that hardware and software impose on design and development
- explain risk and critical path management, relevant to interactive game development
- outline the game production, testing and trialling process
- discuss the process of evaluating game prototypes from technical, design and game play perspectives.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- project briefs
- relevant organisational documentation
- game-production assets
- technical specifications
- industry-standard computer hardware, software, and peripheral devices appropriate for interactive games development.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM402 Identify and apply principles of games design and game playing

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify and apply principles of games design and game playing.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse and document, the methodology relating to various computer game genres	1.1 Review game-play elements in an example of a chosen, or given, game genre 1.2 Identify the objectives of play in an example of a chosen, or given, game genre
2. Interpret consumer demographics for various games products	2.1 Identify the target markets for various types of games 2.2 Interpret the choices and patterns of buyers and players 2.3 Review the social, emotional, and cognitive aspects of contemporary interactive game play
3. Review the historical aspects of game-play and game design	3.1 Review and describe the history of the games industry 3.2 Review the game play, and design, for non-computer based games 3.3 Review the uses of games in commercial, industrial, education, military training, and therapeutic and assessment contexts
4. Identify industry game-design principles	4.1 Research and identify current industry game-design principles 4.2 Identify the game-design principles for a chosen or given game
5. Outline the development of a computer game	5.1 Outline the game design and play strategies 5.2 Outline the technical limitations, and constraints, of current hardware and software

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1-2.3, 3.1-3.3, 4.1, 4.2, 5.1, 5.2	• Interprets and comprehends technical documentation, specifications, market information, statistics, diagrams, objects and images to analyse various aspects of game play and game design, and to identify target markets and interpret consumer demographics
Writing	3.1, 5.1, 5.2	• Uses accurate spelling and grammar, together with game development specific technical terminology, to produce documents as required by the job role
Oral Communication	1.1, 1.2, 2.1, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 5.1, 5.2	• Uses effective listening and open questioning techniques to obtain information about games, game development and the target markets
Numeracy	2.2, 2.3	• Interprets numerical and statistical information relating to target markets, and the games industry
Get the work done	1.1, 1.2, 2.1-2.3, 3.1-3.3, 4.1, 4.2, 5.1, 5.2	• Uses a range of digitally based technologies to access, extract and share relevant information

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM402 Identify and apply principles of games design and game playing	ICAGAM402A Identify and apply principles of games design and game playing	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM402 Identify and apply principles of games design and game playing

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the methodology used for games genres
- differentiate game genres
- identify the consumer demographic for games products
- differentiate game design and play principles
- prepare an outline of a game design according to industry and organisational requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe 3-D digital model design techniques
- outline procedures and processes for computer game development
- identify current game-play hardware and software products
- outline the technical constraints that hardware and software impose on design and development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- the internet
- computer hardware and software appropriate for researching games and the games industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM403 Create design documents for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create a game concept, develop and document the game specifications.

It applies to individuals who support the design, development and programming of basic digital games and design, develop and use digital media technologies as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research, create and document the game concept	1.1 Research, identify and describe the target market for the game 1.2 Research, identify and describe the game genre and its working title 1.3 Identify a suitable game platform 1.4 Identify a suitable game engine 1.5 Prepare the initial concept art to establish the look, and feel, of the characters, environment and game play
2. Create and document the specifications for game design	2.1 Develop the storylines and levels 2.2 Develop the artwork for the characters and environment 2.3 Identify the game-play elements 2.4 Develop the graphical user interface (GUI) 2.5 Identify suitable sounds and music for the game
3. Create, and document, the technical specifications for the game	3.1 Determine game mechanics 3.2 Finalise the platform, game engine and operating system 3.3 Specify the source and purpose of the code to be used, including level-specific code 3.4 Determine the game physics and artificial intelligence 3.5 Determine the sound engineering requirements 3.6 Determine the procedures needed to test the game prototype
4. Collate the game design document	4.1 Define the proposed game features in comparison to existing games 4.2 List the estimated resources required to develop the game 4.3 Prepare the estimated schedule for game development 4.4 Collate the design information, estimates and proposals into a comprehensive game design document

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.5	• Interprets and comprehends technical documentation, financial information, and statistical data to investigate the target market and to identify suitable resources
Writing	1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4	• Uses clear, concise language, accurate spelling, technical terminology and appropriate layout when developing the technical and financial aspects of the game design document • Employs a wide range of descriptive language to create a cohesive and well-structured outline of the game, characters, environment and elements
Oral Communication	1.1, 1.2, 1.3, 1.4	• Uses effective listening and open questioning techniques to elicit the view and opinions of others, and to obtain information
Numeracy	1.1, 1.3, 1.4, 2.1, 2.3, 2.4, 2.5, 3.4, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4	• Uses whole numbers, decimals and percentages to outline parameters and attributes in a wide range of technical specifications • Interprets financial and statistical information and adds, subtracts, multiplies and divides whole numbers and decimals when researching the target market and estimating resources and schedules
Get the work done	1.1-1.5, 2.1-2.5, 3.1-3.6, 4.1-4.4	• Takes responsibility for planning, sequencing and prioritising tasks to achieve outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Uses creativity and initiative in design • Uses specific digital systems, applications and tools to complete routine tasks • Understands the importance of secure information in relation to own work, and takes responsibility for data integrity and management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM403 Create design documents for interactive games	ICAGAM403A Create design documents for interactive games	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTGAM403 Create design documents for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop concept art for characters, environments, splash screens, start screens and game field screens consistent with an identified game genre and design specifications
- develop technical specifications for game mechanics, artificial intelligence, physics, sound, game play and overall usability
- develop game design documents to required industry standard, consistent with client brief and specifications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss the process of computer game development
- compare and discuss current game-play hardware and software products
- outline the technical constraints that hardware and software impose on design and development
- outline the techniques for applying concept development skills
- outline the techniques for applying concept visualisation skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- the internet for research purposes
- computer hardware, software and peripheral devices suitable for game development
- games engines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM404 Apply artificial intelligence in game development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research, develop and implement artificial intelligence (AI) solutions in games.

It applies to individuals who contribute to the creation of computer-controlled objects in games, and who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Conduct research on AI strategies	1.1 Describe the terminology involved in AI, as it relates to games and the game industry 1.2 Identify and analyse the range of AI path-finding strategies, including the appropriate genre and environments, and how they influence design and development 1.3 Discuss AI strategies and ideas, and collaborate as required, with the relevant personnel to ensure the contribution of a range of ideas and creative solutions, and to fulfil the requirements of the brief 1.4 Organise research and findings for use by relevant personnel throughout the development process, updating as required
2. Design an AI strategy for games	2.1 Generate a range of possible goals and actions, and other factors in the design of an AI non-player character (NPC) 2.2 Select the AI strategies for NPCs for the game design that are technically feasible, respond to the brief, and provide creative solutions to all design issues 2.3 Continuously reflect on, and assess, AI strategies for implications regarding the budget, timeline, technical feasibility, and suitability for the brief
3. Implement an AI strategy	3.1 Implement a path-finding algorithm in a game 3.2 Implement an NPC AI strategy in a game
4. Evaluate the game, based on NPC AI	4.1 Review the game design, and AI strategies, for the fulfilment of the design brief 4.2 Discuss and confirm additional requirements, or modifications, to the game design with the relevant personnel, and undertake any necessary amendments

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.2, 2.3	• Investigates, interprets and comprehends technical documentation, diagrams, icons, symbols, text, numbers and letters when determining AI strategies
Writing	1.1, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2	• Uses clear, concise language, accurate spelling and technical terminology, to organise research findings and to document progress towards goals • Develops AI solutions using the correct code layout, code, diagrams, icons, symbols, text, numbers and letters
Oral Communication	1.1, 1.2, 1.3, 4.1, 4.2	• Uses effective listening and open questioning techniques, together with technical terminology, to elicit the view and opinions of others, and to give and obtain information
Numeracy	1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2	• Uses whole numbers and decimals to outline parameters • Interprets budgets, and adds, subtracts, multiplies and divides whole numbers and decimals to ensure that the budget, timelines and other brief requirements are met
Get the work done	1.2-1.4, 2.1-2.3, 3.1, 3.2, 4.1, 4.2	• Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making and analytical processes for more complex and non-routine situations • Uses creativity and initiative in design • Uses key features of specific digital systems and tools to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM404 Apply artificial intelligence in game development	ICAGAM404A Apply artificial intelligence in game development	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTGAM404 Apply artificial intelligence in game development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and analyse artificial intelligence (AI) strategies for appropriateness to a game development brief
- design a feasible AI strategy for a game
- implement path finding algorithms and non-player character AI strategies in a game
- review and evaluate an AI strategy for a game.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the implications of basic path-finding algorithms on game development
- list and define the major AI terms used in the game industry
- outline the development process for creating AI strategies for non-player characters (NPCs) in a game
- describe the application of object-oriented programming practices
- describe the overall architecture of a game engine.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- research tools including the internet
- path-finding libraries
- development tools to implement AI strategies
- game design specifications and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM405 Write story and content for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify and develop storylines, write plot synopses and background stories, and to develop story components for interactive digital games.

It applies to individuals who are employed as game concept developers, script writers, storyboard artists, game designers and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and develop storylines with game potential	1.1 Identify potential storylines for game development, to current industry standards and regulations 1.2 Modify and enhance storylines to suit the game environment 1.3 Determine the appropriate game genre
2. Write the plot synopsis and background story	2.1 Determine character profiles 2.2 Develop environment profiles consistent with the storyline 2.3 Develop the background story 2.4 Develop the initial plot profile 2.5 Develop plot synopsis and options, and link to specific game levels
3. Develop story components	3.1 Source the initial concept artwork 3.2 Develop level specifications and storylines 3.3 Initiate the development of storyboards showing plot development, cinematic and level outlines
4. Finalise story components for inclusion in the game design brief	4.1 Seek feedback on the story and concept 4.2 Finalise the story concept, profiles and other specifications for inclusion in the game design brief

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 3.1	• Identifies and evaluates a variety of texts to aid concept development
Writing	1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3, 4.2	• Uses clear, concise language, accurate spelling, technical terminology, and appropriate layout, when developing the technical aspects and flowcharts for the game storyline • Employs a wide range of descriptive language to create cohesive and well-structured content for the characters, environment and plot
Oral Communication	1.1, 1.3, 3.1, 3.3, 4.1	• Uses effective listening, open questioning techniques and reflective responses to obtain views, ideas, information and feedback • Presents the concept and storyline clearly, using words and non-verbal features appropriate to the audience
Navigate the world of work	1.1	• Identifies and complies with industry and regulatory requirements
Get the work done	1.1-1.3, 2.1-2.5, 3.1-3.3, 4.1, 4.2	• Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Uses creativity and initiative in the story, and the visual design • Uses information and communications technology (ICT) based tools to conduct research, design work processes, and complete work tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM405 Write story and content for digital games	ICAGAM405A Write story and content for digital games	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM405 Write story and content for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop storylines for games, according to current industry standards
- apply processes and procedures to facilitate quality script writing
- apply the role of narrative in game development
- seek, and professionally respond to, feedback regarding concept and storylines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline budgeting and scheduling considerations for game development
- outline the copyright and intellectual property protection regulations for written narrative and concept graphics
- discuss different story requirements for particular game genres
- discuss the role of story writing in game development, and the quality of the final product
- outline research methods that can be used to stay abreast of the latest changes and narrative development for games
- discuss tools and techniques for developing game narrative.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- a range of current computer games across all platforms and genres
- a range of the latest consoles and hand-held game devices
- the internet for research purposes
- computer hardware, software and games engines
- file storage
- current copyright and intellectual property legislation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM406 Create visual design components for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create visual design components for games and interactive media using industry standard authoring tools.

It applies to individuals who contribute who support the design, development, and programming of digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the commonly used visual design components for games and interactive media	1.1 Obtain the project brief and documents 1.2 Identify the features of visual design components for games and interactive media 1.3 Discuss design considerations for an interactive visual design component with relevant personnel
2. Identify the graphics software packages used for visual design	2.1 Identify and review the range of industry-standard graphics software available 2.2 Assess the software related to visual design component requirements 2.3 Discuss the technical specifications for rendering and editing processes with relevant personnel 2.4 Select the graphics software package
3. Use graphics software	3.1 Run the graphics software and become familiar with the interface 3.2 Create new files and organise a file structure 3.3 Learn the tools and features used to create visual design components
4. Create the visual design components for a game and interactive media	4.1 Design a basic graphical user interface (GUI) for a game and interactive media 4.2 Consider the interaction processes of GUI elements 4.3 Document the design and programming requirements needed to implement the GUI 4.4 Use graphics software to create visual design components to be used for the GUI
5. Evaluate the implementation	5.1 Demonstrate the component to relevant personnel 5.2 Evaluate the usability of the design components 5.3 Reflect on possible changes to improve the visual design and interactivity of the components

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1, 3.3	• Identifies, investigates and applies information from a variety of texts containing highly technical language, to expand own knowledge of chosen graphics software programs
Reading	1.1, 1.2, 2.1, 3.1	• Identifies and interprets a range of documents containing complex terminology, and applies the information in selecting software and designing the GUI • Interprets and comprehends diagrams, icons, symbols, text, numbers and letters necessary to design a GUI
Writing	4.1, 4.3, 4.4	• Uses correct spelling and grammar, plain English, specific terminology and the appropriate document layout, when documenting GUI design for developers • Uses a vocabulary level suited to the intended audience and game in GUI design
Oral Communication	1.1, 1.3, 2.1, 2.3	• Participates in verbal exchanges of ideas and solutions, using games terminology and effective listening and questioning techniques to clarify information • Presents the design using games specific terminology and non-verbal features appropriate to the audience
Numeracy	1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.3, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3	• Uses whole numbers, decimals and percentages relevant to measurement, font size, scale, ratio, coordinates, colour, shading and other attributes/variables in the development design specifications, and GUI components
Interact with others	5.1	• Cooperates with others as part of routine activities relevant to gaming design concepts
Get the work done	1.1-1.3, 2.1-2.4, 3.1-3.3, 4.1-4.4, 5.1-5.3	• Makes decisions, and implements procedures, for both routine and non-routine tasks using formal decision-making processes • Plans, organises and completes work according to defined requirements and schedules, taking responsibility for decisions and sequencing tasks to achieve efficient outcomes • Uses a high level of creativity, innovation and initiative in interactive game design • Uses digital systems and tools to complete tasks • Understands the importance of secure information in

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		relation to own work, and takes responsibility for data structure, format and management

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM406 Create visual design components for interactive games	ICAGAM406A Create visual design components for interactive games	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTGAM406 Create visual design components for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- demonstrate original approaches to the creative development of a graphical user interface (GUI)
- implement game development and production strategies
- maintain the integrity of the design brief
- develop concept art and design specifications for splash screens, start screens and game field screens, consistent with a design brief
- develop technical specifications for visual design components and overall usability
- implement and evaluate a working GUI with basic functionalities.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of GUI design and related programming techniques
- list the human resources required in the process of creating visual design components
- list technology requirements and outline technical constraints that they impose on design and development
- discuss techniques for applying concept development skills
- discuss techniques for applying concept visualisation skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- a design brief
- computer hardware, software, and peripheral devices suitable for games development
- games engines
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM407 Write scripts for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, write and test scripts and related content for interactive games.

It applies to individuals who contribute and support the design, development, and programming of digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify story components	1.1 Identify creative concepts for the script 1.2 Identify game genres and story components for script development
2. Develop script components	2.1 Develop a script structure consistent with the genre and the game design brief 2.2 Develop script components for the main plot, background stories, and level or mission stories consistent with the genre and game design brief
3. Write a draft script	3.1 Write a script synopsis 3.2 Write a draft script for the main characters and their interactions using the structure and components previously determined, according to the brief 3.3 Write a draft script for background stories and level/mission stories using the previously determined structure and components, according to the brief 3.4 Develop character and narrator dialogue 3.5 Initiate storyboards for draft scripts in the required format
4. Review the script based on feedback	4.1 Present the synopsis and storyboards to the client and the relevant personnel for feedback 4.2 Collate, and respond to, comments and feedback 4.3 Revise scripts and storyboards consistent with feedback 4.4 Undertake focus testing with the intended audience
5. Write the final script	5.1 Collate, and respond to, comments and feedback from focus testing 5.2 Rewrite the script synopsis where required 5.3 Rewrite the script or dialogue where required 5.4 Initiate revised storyboards where required 5.5 Present the final script in agreed format to the client and colleagues

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 4.2, 4.4, 5.1	• Interprets and comprehends a range organisational and client documentation, to identify the aim of the proposed games • Reviews feedback containing a wide range of vocabulary and terminology, ranging from simple to highly technical, depending on the source of the feedback
Writing	2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 4.3, 4.4, 5.2, 5.3, 5.4	• Uses correct spelling and grammar, together with descriptive language, to create a cohesive and well-structured script for the game, plot, characters, environment and elements • Develops focus testing documentation using plain English and non-leading questioning techniques
Oral Communication	1.1, 1.2, 4.2, 4.3, 5.1, 5.4	• Participates in a verbal exchange of ideas and uses detailed and clear language, effective listening skills and open questioning techniques to elicit and clarify information and feedback • Presents the script using persuasive presentation techniques, plain English (translating games specific terminology where necessary)
Interact with others	4.1, 4.4, 5.5	• Cooperates with others as part of routine activities through the explanation and testing of gaming scripts
Get the work done	1.1, 1.2, 2.1, 2.2, 3.1-3.5, 4.1-4.4, 5.1-5.5	• Makes decisions and implements procedures for routine and non-routine tasks, using formal decision-making processes • Plans, organises and completes work according to defined requirements and schedules • Uses a high level of creativity and initiative in writing scripts • Uses information and communications technology (ICT) based tools to write, source and analyse information • Understands the importance of secure information in relation to own work, and takes responsibility for data management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM407 Write scripts for interactive games	ICAGAM407A Write scripts for interactive games	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM407 Write scripts for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the key components of the story
- develop the script structure and components
- write scripts consistent with the game design brief and client requirements
- communicate and liaise with the relevant personnel to review scripts
- prepare a final script and present to the client.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss budgeting and scheduling considerations for game development
- discuss the components that drive script narrative and engage the target audience
- describe the contribution of script writing to narrative development and engaging game play
- outline focus testing processes and procedures
- discuss game genres and narrative structures
- list industry formats for game scripts
- outline research methods for:
  - keeping abreast of competitors' work in developing stories and scripts for games
  - obtaining factual information as a basis for character, location and narrative development
  - locating the owners of copyright and intellectual property used in the development of games
  - describing script structures and character profiling for interactive games
  - discussing scriptwriting techniques and the requirements for interactive games
  - identifying procedures for seeking permission from copyright owners for the use of protected elements in scripts
  - describing different storyboarding techniques.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- reference materials for scriptwriting
- the internet for research purposes
- a range of state-of-the-art computer games, across all platforms and genres
- a range of games consoles and hand-held game devices, computer hardware, software, and peripheral devices
- games engines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM408 Use 3-D animation interface and toolsets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to investigate, customise, and use 3-D animation software interfaces and toolsets.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Locate and identify the 3-D application navigation controls	1.1 Using chosen 3-D modelling and animation software, identify a range of 3-D navigation types, including panning, zooming and rotating around the viewport 1.2 Identify the methods of use for navigation, keyboard hotkeys and input procedures to improve user performance
2. Locate and identify the 3-D animation toolsets	2.1 Identify the common toolsets of 3-D animation software 2.2 Identify and analyse the 3-D application menus, and specific category types 2.3 Use common 3-D application transformation types 2.4 Select and use, common 3-D application-specific toolset types
3. Select and clarify appropriate menu categories for requirements	3.1 Associate the menu categories as required for specific tasks 3.2 Consult with the relevant personnel, and use application hotkeys for superior application interaction
4. Initiate and use application-support materials	4.1 Identify and research the range of reference material available for use in creating 3-D animation and digital effects 4.2 Present the reference material for use in the 3-D animation process 4.3 Identify the native application support procedures 4.4 Access support documents and help files, through hotkey and application menus 4.5 In consultation with the relevant personnel, use support material as required
5. Identify and plan 3-D application import and export procedures	5.1 Discuss with relevant personnel application file-management procedure types, including opening, importing, saving and exporting 5.2 Discuss, and use, application project configuration procedures with the relevant personnel 5.3 Prepare and create projects as required
6. Identify and use application feedback	6.1 Discuss user application feedback with the relevant personnel 6.2 Use application feedback to troubleshoot error scenarios, as required

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ELEMENT	PERFORMANCE CRITERIA
	6.3 Use feedback with inbuilt support documentation, as required
7. Customise application interface	7.1 Identify variation of user interface windows and panels configurations 7.2 Use the custom interface for specific requirements based on toolset procedural needs

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.1, 4.1, 4.3, 4.4, 4.5, 6.1, 7.1	• Identifies and interprets information from texts containing complex terminology, acronyms and jargon • Interprets and comprehends computer generated text, diagrams, icons, symbols, numbers and letters necessary to use 3-D animation software
Oral Communication	1.1, 1.2, 2.1, 2.2, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7.1	• Employ effective listening and questioning techniques to obtain information • Participates in a verbal exchange of ideas and solutions using plain English and games terminology, summarising the main points to ensure understanding
Numeracy	2.3, 2.4, 5.1, 5.2, 5.3	• Uses whole numbers, decimals and percentages relevant to measurement, font size, scale, ratio, coordinates, colour, shading and other attributes/variables in the development of animations
Interact with others	3.2, 4.5	• Cooperates and collaborates with others as part of routine activities, and to elicit support
Get the work done	1.1, 1.2, 2.1-2.4, 3.1, 3.2, 4.1-4.5, 5.1-5.3, 6.1-6.3, 7.1, 7.2	• Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses digital systems and tools to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM408 Use 3-D animation interface and toolsets	ICAGAM408A Use 3-D animation interface and toolsets	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM408 Use 3-D animation interface and toolsets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interact and navigate with 3-D application interface and toolsets
- manage files to protocols
- execute and use 3-D application native support
- use 3-D application user feedback
- configure custom panels and window configurations.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline 3-D animation production protocols
- describe the contents and application of a production brief
- outline the process for the development and recording of ideas
- outline the protocols for filing media assets
- outline fundamental research principles
- discuss the principles of design and colour for use in 3-D animation and digital effects environments
- outline the procedures for producing a storyboard and script
- discuss the technical constraints that hardware and software impose on graphics requirements and creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- reference materials
- appropriate computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM409 Create 3-D characters for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and build 3-D characters for commercial games.

It applies to individuals who support the design, development and implementation of the 3D characters of digital games, as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and analyse the characters	1.1 Determine and agree on the style of characters, according to the client requirements 1.2 Determine and agree on, the character type and profile 1.3 Determine and agree on, the character role and name 1.4 Determine and agree on, the character animations required for implementation into game systems 1.5 Compare the animations with the analysis criteria
2. Design the characters	2.1 Develop a concept illustration for the character 2.2 Conduct focus testing of the concept illustration with the client, and with representatives of the target market audience 2.3 Develop character schematics based on feedback, and submit to the client for approval
3. Develop the character models	3.1 Construct a 3-D character model on a turntable, based on the character schematics 3.2 Construct 3-D costumes, tools and accessories for the character model 3.3 Shade, texture and light, the completed character model 3.4 Implement joints, vertex weighting and character rig, to a 3-D character model 3.5 Develop animation blocking and in-betweens, in consultation with animation personnel for their approval 3.6 Compare the 3-D models and animations to the original concept illustration, for verification of quality and conformity to the brief 3.7 Submit to the client for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.5, 2.3	• Identifies and interprets design briefs, and related technical documentation, containing complex animation-specific terminology and acronyms • Interprets and comprehends computer-generated text, diagrams, icons, symbols, numbers and letters necessary to use 3-D animation software
Writing	2.2	• Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing documentation for focus testing
Oral Communication	1.1, 1.2, 2.2, 2.3, 3.6	• Employs effective listening and questioning techniques to obtain information • Participates in a verbal exchange of ideas and solutions, using plain English and 3-D animation terminology, summarising the main points to ensure understanding
Numeracy	1.4, 2.1, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5	• Uses whole numbers, decimals and percentages relevant to measurement, font size, scale, ratio, coordinates, colour, shading and other attributes/variables, in the development of the animations
Interact with others	1.1-1.3, 2.2	• Cooperates with others as part of familiar routine activities, to confirm agreement
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.7	• Makes decisions and implements procedures for both routine and non-routine tasks, using formal decision-making processes • Plans, organises and completes work, according to the defined requirements and schedules • Uses creativity and initiative in character design • Uses digital systems and tools proficiently to complete required tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM409 Create 3-D characters for interactive games	ICAGAM409A Create 3-D characters for interactive games	Updated to meet Standards for Training Packages. Edited Performance Criteria for clarity.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM409 Create 3-D characters for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and realise the characters for games, using 2-D and 3-D software applications
- develop character designs that comply with the games design brief, and the client requirements
- develop the character designs
- test responses to the character designs for aesthetic suitability with the intended audience, and act on the feedback.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the features of 3-D software packages used to create 3-D character models for games
- interpret the game design briefs
- discuss the methods of 3-D character modelling, within the technical parameters and constraints of game development
- discuss the technical limitations for the creation of 3-D character models for games.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- character reference materials, such as models, illustrations, art and design books, and character photographs
- a range of state-of-the-art games, across all platforms and genres
- a range of the latest consoles and hand-held game devices
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM410 Develop 3-D components for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, and to create, 3-D components within a games environment.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm 3-D component requirements within the game context	1.1 Identify the definition and purpose of 3-D components, with examples 1.2 Identify the context of 3-D component design within the game design document 1.3 Create a list of required 3-D components
2. Identify 3-D component integration methods within game architecture	2.1 Discuss the 3-D component format, file extensions and the ramifications of choice with the relevant personnel 2.2 Establish the methods of 3-D component loading and usage
3. Establish the content creation pipeline	3.1 Finalise the required 3-D component list 3.2 Discuss the hardware and software required for the creation of 3-D components and assets 3.3 Discuss the methods of naming 3-D components and assets, and file archiving 3.4 Establish the deadlines for 3-D component creation
4. Integrate 3-D components for testing and analysis	4.1 Identify the evaluation methods for quality assurance 4.2 Ensure that the produced 3-D components meet the established quality requirements 4.3 Make changes to 3-D components, as required, by testing and evaluation 4.4 Submit the finalised assets with the archiving format outlined in the assignment brief

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 4.1, 4.3	• Identifies and interprets briefs and related technical documentation containing complex task-specific terminology • Interprets and comprehends computer generated text, diagrams, icons, symbols, numbers and letters necessary to use 3-D application software
Writing	1.1, 1.3, 3.1, 3.4	• Uses correct spelling, grammar, technical terminology and organisational templates/document structures to develop lists and schedules
Oral Communication	1.1, 1.2, 2.1, 2.2, 3.2, 3.3, 3.4, 4.1, 4.4	• Employs effective listening and open questioning techniques to obtain information • Participates in a verbal exchange of ideas and solutions using plain English and games development terminology, summarising the main points to ensure understanding
Numeracy	1.2, 2.1, 2.2, 3.4, 4.2, 4.3	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, font size, scale, ratio, coordinates, colour, shading and other attributes/variables in the development of 3-D components and timelines • Defines timeframes in accordance with schedule requirements
Get the work done		• Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses a systematic process to evaluate work and to implement improvements • Uses key features of specific digital systems and tools, effectively to complete routine tasks • Understands the importance of file format and takes responsibility for data integrity and management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM410 Develop 3-D components for interactive games	ICAGAM410A Develop 3-D components for interactive games	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTGAM410 Develop 3-D components for interactive games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and confirm 3-D component designs
- identify component integration
- establish the component development pipeline
- generate 3-D components for games
- test and analyse component integration
- submit final product.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss and explain current game hardware and software products
- discuss and explain game-engine architecture and methods used in component importing
- outline processes and techniques related to:
  - the creation of 3-D objects within industry-standard modelling software
  - the use of industry formats for the development of 3-D models and objects.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM412 Design interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and implement technologies relating to human-computer interaction.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define human-computer hardware interface devices	1.1 Identify standard human-computer interaction devices 1.2 Identify game-specific human-computer interaction devices and the common controls used in their implementation
2. Research common event-handling systems	2.1 Identify and review industry-standard event-handling systems used in application libraries 2.2 Create an application, accessing and using technologies, and showcasing captured events from hardware devices 2.3 Consider the human-computer interaction device selection
3. Research commonly used graphical user interface (GUI) widget sets	3.1 Identify common widgets and their usage within an application environment 3.2 Identify and review industry-standard graphical user interface libraries, and their relevancy within game engine software 3.3 Consider the selection of widgets within a game heads-up display (HUD) 3.4 Use human-computer interface devices and event-handling call-backs in the creation of an application, showcasing the captured events with GUI widgets
4. Design a simple media software device	4.1 Design a prototype for the development of a custom user interface widget to be used within a game heads up display environment 4.2 Select GUI software for implementation and discuss the ramifications of the selection
5. Build and implement a simple media software device	5.1 Integrate all custom widget elements, as required by the prototype specifications 5.2 Make final checks to ensure that the functionality conforms to the original design 5.3 Save into specified storage systems

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.1, 3.2	• Identifies and evaluates online documentation containing complex technical terminology to conduct research into hardware, existing interactive media and industry standards • Interprets and comprehends computer-generated text, code, diagrams, icons, symbols, numbers and letters necessary to use the relevant software
Writing	2.2, 3.4, 5.1	• Recognises and uses technical terminology, application terminology, code, syntax and labelling when conducting research and developing interactive media
Oral Communication	1.1, 1.2, 2.3, 3.1, 3.2, 3.3, 4.1	• Employs effective listening and open questioning techniques to obtain information • Participates in verbal exchanges of ideas and solutions using plain English and interactive media terminology, summarising the main points to ensure understanding
Numeracy	2.2, 2.3, 3.3, 3.4, 4.1, 4.2, 5.1, 5.2, 5.3	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, font size, scale, ratio, colour, shading and other attributes/variables in the development of interactive media
Get the work done	All	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options, and seeking input and advice from others before taking action, when necessary • Uses key features of specific digital systems and tools, effectively to complete required tasks • Understands the importance of file integrity and management

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM412 Design interactive media	ICAGAM412A Design interactive media	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM412 Design interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define hardware and software requirements for the human-computer interaction environment
- research event handling systems and graphic user interfaces (GUI)
- design a simple application, using correct methods of hardware event handling, within the context of a video game environment
- produce a custom control for use within a large project
- present a completed project on time.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain programming techniques appropriate to interactive media
- define specific terminology used by computer game developers
- describe common human-computer interaction devices and their application
- describe common widgets and their usage
- define a 'heads-up display'
- outline the technical constraints that hardware and software impose on design and development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM413 Design and create 3-D digital models

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and create 3-D models.

It applies to individuals who design, develop and use digital media technologies, working independently or as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clarify work requirements	1.1 Clarify the requirements and purpose for the design, and creation, of 3-D digital models, with reference to the production documentation 1.2 Clarify organisational guidelines and work flow sequences to ensure that the production schedule deadlines are met with the relevant personnel 1.3 Select the software that best suits the type of production and delivery platform for which 3-D digital models are being designed and created 1.4 Gather and analyse reference materials to help with the design and visualisation of 3-D models
2. Design 3-D digital models	2.1 Design, and sketch, the concept drafts of a 3-D model 2.2 Create the concept art for 3-D models 2.3 Create the prototypes of 3-D models
3. Create 3-D digital models	3.1 Use software features to block out models, to determine the correct proportions related to reference materials 3.2 Manipulate software features to apply basic lighting and shaders, as required 3.3 Ensure that models' topology allows appropriate deformation, as required 3.4 Progressively refine and check the integrity of models until they meet the design requirements 3.5 Submit the models to the relevant personnel for comment regarding whether the production requirements have been met, and make final adjustments as required 3.6 Render and output the models in the required format, and submit them to the relevant personnel by the agreed deadlines 3.7 Make backup copies of the files and complete the workplace documentation, according to enterprise procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 3.1	• Identifies and evaluates documentation containing complex technical terminology to interpret the design brief and to conduct research into the design and visualisation of 3-D models • Interprets and comprehends computer-generated text, diagrams, icons, symbols, numbers, and letters necessary to use the relevant software
Oral Communication	1.1, 1.2	• Employs effective listening and open-questioning techniques to clarify design requirements, project scheduling and to obtain feedback
Numeracy	1.1, 1.2, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 3.6	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, scale, form, weight, volume, colour, shading, and other attributes/variables in the development of 3-D models
Get the work done	All	• Takes responsibility for planning tasks required to achieve required outcomes, negotiating some key aspects with others • Implements actions as per plan, making slight adjustments if necessary, and addressing some unexpected issues • Uses analytical processes to make decisions directly related to tasks • Evaluates outcomes of design solutions to improve future responses • Selects or supports new ideas on the basis of their contribution to the achievement of broader goals • Uses key features of specific digital systems and tools to complete required tasks • Manages and maintains files in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM413 Design and create 3-D digital models	ICAGAM413A Design and create 3-D digital models	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM413 Design and create 3-D digital models

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, create and store 3-D digital models that meet work, design and production requirements
- communicate with personnel to clarify initial requirements, including deadlines, and to receive feedback about models.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the principles of 3-D digital modelling and design
- outline the stages in the production process, from the initial design through to the finished product
- describe the common issues and challenges that arise in the context of designing and creating 3-D digital models
- outline the roles and responsibilities of project team members in the development of digital models
- outline the features of a range of delivery platforms
- discuss geometry as it applies to the design and creation of realistic 3-D digital models
- discuss the use of scale, form, weight and volume in the development of 3-D digital models.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM414 Create audio for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce and manipulate audio assets for computer games, using a variety of tools.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and document game audio requirements	1.1 Explore the evolution of audio hardware and audio formats 1.2 Provide a historical perspective on how audio has become integrated into computer games 1.3 Identify current trends and consider their impact on the future of game audio
2. Research and document the use of audio in computer games	2.1 Identify the different methods for using audio in computer games 2.2 Explore the role of music in creating mood and atmosphere 2.3 Explain how sound effects and vocals are used within computer games
3. Source existing sound effects, music tracks and voice recordings	3.1 Find sources of sound effects, music tracks and voice recordings 3.2 Create and maintain a small collection of audio assets 3.3 Identify the different audio formats 3.4 Differentiate between compressed and uncompressed audio formats 3.5 Identify the different genres of music 3.6 Develop an awareness of audio copyright laws and royalty-free audio
4. Record and manipulate audio for a game	4.1 Record character voices, music and sound effects 4.2 Develop a sound track for a game using audio-editing 4.3 Use audio-editing software to rearrange audio samples, and apply audio effects 4.4 Select an appropriate sample format and bit rate 4.5 Normalise the audio samples to make volume uniform 4.6 Trim the audio samples 4.7 Apply the audio effects 4.8 Export audio to a suitable format
5. Create sound effects or music for a game	5.1 Identify digital sound waveforms 5.2 Apply basic music theory to simple music-creation tool

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Determine the suitable musical notation 5.4 Identify and use musical creation tools 5.5 Compose a simple piece of music for a game 5.6 Create various sound effects for a game
6. Research audio-programming libraries	6.1 Compare and contrast the functional capabilities of audio-programming libraries 6.2 Explore the use of channels and mixing
7. Integrate sound, music and vocals into a computer game	7.1 Play a mixture of cached and streaming audio sources 7.2 Integrate the sound effects in response to different events 7.3 Incorporate the ambient music into sections of the computer game 7.4 Locate and play the positional audio sources

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 2.1, 2.2, 3.1, 3.3, 3.4, 3.5, 3.6, 6.1	• Identifies and evaluates documentation containing complex technical and audio terminology, to research the current and future use of audio in games, and to identify appropriate hardware, software and assets • Interprets and comprehends computer-generated text, audio tracks, abbreviations, symbols, icons, numbers, and letters necessary to use audio-editing software
Writing	1.1, 1.2, 2.2, 2.3, 6.2	• Uses correct spelling and grammatical structures and clear language, and technical terminology
Oral Communication	1.1, 1.2, 1.3, 2.1, 2.3, 3.1, 3.3, 3.4, 3.5, 3.6, 6.2	• Elicits information using effective listening and open-questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology to plain English
Numeracy	3.4, 4.1-4.8, 5.1-5.6, 6.1-6.2	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, pitch, speed, tempo, time, frequency, amplification and other attributes/variables in the development of audio
Navigate the world of work	3.6	• Takes personal responsibility for adherence to legal/regulatory responsibilities relevant to own work context, in relation to copyright laws
Get the work done	1.1, 2.2, 2.3, 3.1-3.6, 4.2-4.8, 5.1-5.6, 6.2, 7.1-7.4	• Plans, organises and implements tasks required to achieve required outcomes • Implements actions as per plan, making slight adjustments if necessary • Uses exploration, analytical and lateral thinking to identify new ideas and adapt existing ideas to current context • Uses digital systems and tools to create and save files in required formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM414 Create audio for digital games	ICAGAM414A Create audio for digital games	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM414 Create audio for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research game audio requirements
- locate and obtain suitable audio resources
- record and manipulate audio
- generate sound effects
- compose simple music tracks for a game
- use audio programming libraries in a game.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe audio-editing tools
- discuss and explain different audio formats and their application to games
- discuss and explain the capabilities of audio-programming libraries
- explain copyright as it applies to audio recordings
- discuss music-creation tools and their relation to music theory.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- appropriate computer hardware, software and peripheral devices
- digital audio editing software
- games engines and file storage
- copyright and intellectual property legislation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM415 Develop simple environments for 3-D games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the performance outcomes, skills and knowledge required to research, design, verify, validate, develop, and evolve simple environments for different genres of games.

It applies to individuals working in the game development environment as concept artists, matte painters, game designers, animators and other personnel.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and analyse brief requirements	1.1 Interpret the brief and clarify the design requirements, in consultation with the client 1.2 Identify the design, technical constraints and innovative features of the environments 1.3 Identify the software, media and file formats for digital imagery 1.4 Identify the production workflow requirements, and develop the production pipeline to meet client requirements
2. Design and visualise the environment	2.1 Develop the concept illustration for the environment, consistent with the game genre 2.2 Conduct focus testing of the concept illustration with the client and the representatives of the target market audience 2.3 Submit to the client for approval and feedback 2.4 Make adjustments to the concept illustration, based on comment and feedback
3. Verify and validate the environment	3.1 Create an environment prototype according to the design brief, guidelines, and feedback on the concept illustration 3.2 Conduct focus testing and seek recommendations for the further enhancement of the documented environment prototype 3.3 Make adjustments to the environment prototype, based on comment and feedback 3.4 Submit to the client for approval and feedback
4. Develop and evolve environment	4.1 Further enhance the environment prototype based on recommendations generated from focus testing 4.2 Submit to the client for approval and feedback 4.3 Finalise the environment design 4.4 Save and archive the files in agreed formats and repository

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.3	• Identifies and evaluates documentation containing complex technical terminology to interpret the design brief and conduct research into the design of 3-D game environments • Interprets and comprehends computer generated text, diagrams, icons, symbols, numbers and letters necessary to develop environment prototypes
Writing	2.2, 3.2	• Develops focus testing documentation according to organisational and user requirements
Oral Communication	1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 3.2, 3.4, 4.2	• Participates in verbal exchanges of ideas using detailed and clear language, effective listening skills and open-questioning techniques to elicit and clarify information and feedback • Presents the concept illustration and environment prototype using persuasive presentation techniques, plain English, translating games specific terminology where necessary
Numeracy	1.1, 1.2, 1.3, 1.4, 2.1, 2.4, 3.1, 3.3, 4.1, 4.3	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, scale, form, weight, volume, colour, shading and other attributes/variables in the development of environments for 3-D games
Interact with others	1.1, 2.2, 2.3	• Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, and taking a leadership role when conducting focus testing
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4	• Plans a range of routine, and some non-routine, tasks, aiming to achieve required outcomes efficiently and effectively • Implements actions as per the plan, making slight adjustments if necessary, and addressing some unexpected issues when developing and evolving the environment design • Analyses feedback from others to make design decisions • Identifies and adapts ideas being used in similar contexts and understands and explicitly applies some basic principles of analytical and lateral thinking • Understands the key principles and concepts

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		underpinning the functions of digital systems and tools • Manages and maintains the files securely in a variety of storage media and formats

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM415 Develop simple environments for 3-D games	ICAGAM415A Develop simple environments for 3-D games	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM415 Develop simple environments for 3-D games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and analyse requirements from the client's brief
- develop environment designs that comply with the games design brief and client requirements
- verify and validate the environment prototype
- test responses to the environment designs with the intended audience
- finalise the environment design.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- determine the budgeting and scheduling considerations for environment creation in games, with consideration given to human resources
- discuss the techniques applied to environment design and realisation, including how the genre of the game influences environment requirements
- discuss how to interpret environment design briefs
- describe the role and position of interactive environments in commercial game development, game duration, and quality
- outline the processes and procedures needed to facilitate quality, and innovation in the design of 3-D environments
- identify the prototyping tools and techniques for commercial environment development in games
- outline the research methods used to stay abreast of the latest developments in game environment design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- appropriate computer hardware and software
- input and output devices
- game design documents or specifications
- style shots.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM416 Prepare and complete image rendering processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select suitable rendering applications and prepare and optimise rendering for 3-D modelling, animation and game development.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the rendering requirements	1.1 Identify the equipment and media required for the project 1.2 Identify the features of the rendering software packages used in the film and games industries 1.3 Analyse the design brief, or other reference sources, to plan and determine the rendering requirements
2. Select a suitable rendering application to achieve desired appearance	2.1 Select the rendering software with the capability to achieve the desired effects within the timeframe and budget 2.2 Confirm that the selection is according to the brief, system limitations and requirements
3. Prepare rendering application for desired outcome	3.1 Select and apply the appropriate image resolutions, image aspect ratio, and pixel ratio 3.2 Adjust the renderer attributes to obtain desired anti-aliasing 3.3 Adjust the renderer attributes to obtain other desired visual effects
4. Check the render integrity and quality	4.1 Refine the render integrity 4.2 Re-link any missing images and textures 4.3 Test the render times for optimising process 4.4 Test the alpha channels and opacity matts 4.5 Test the render layers and passes
5. Optimise the images for render processes	5.1 Complete pre-rendering optimisation tasks 5.2 Adjust and refine renderer attributes to optimise render times 5.3 Select the appropriate file format for output, according to the brief 5.4 Select the appropriate filenames and output destinations
6. Render the images and save files appropriately	6.1 Undertake the final rendering processes 6.2 Store or archive the files 6.3 Review the completed render to ensure compliance with the system and the brief 6.4 Confirm the rendering with the relevant personnel

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 2.2, 6.3	• Interprets a design brief containing complex games-design terminology • Interprets and comprehends a large range of diagrams, icons, symbols, text and letters necessary to use complex rendering software
Oral Communication	1.1, 1.2, 1.3, 2.2, 6.4	• Uses effective listening and questioning techniques to obtain information about the design brief, system limitations, software capabilities, and requirements • Presents rendering outcomes using industry-specific terminology
Numeracy	1.2, 1.3, 2.1, 2.2, 3.1-3.3, 4.1-4.5, 5.1-5.3, 6.3	• Uses whole numbers, decimals and percentages relevant to measurement, resolution aspect ratio, pixel ratio, scale, coordinates, colour, shading, and other attributes/variables in the application of rendering • Interprets numerical information and applies basic mathematical calculations relating to the timelines and budgetary information
Interact with others	6.4	• Collaborates with others as required to confirm rendering output is acceptable
Get the work done	All	• Applies formal processes when planning the rendering requirements, producing plans with logically sequenced steps that reflect awareness of time and resource constraints • Implements actions as per the plan, making slight adjustments if necessary • Recognises and takes responsibility for addressing predictable, and some less predictable problems in familiar work contexts • Understands the key principles and concepts underpinning the design and operation, of digital systems and tools • Manages and maintains files securely in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM416 Prepare and complete image rendering processes	ICAGAM416A Prepare and complete image rendering processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM416 Prepare and complete image rendering processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify equipment, media and rendering software requirements according to design brief and system requirements
- use and optimise the rendering application components for best performance
- adhere to requirements related to file sizes and formats
- store the rendered components according to requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the features of software used for:
  - 3-D animation
  - 3-D modelling
  - lighting
  - rendering
  - shading
  - texturing
- explain requirements for file formats and sizes
- outline pre-rendering optimisation techniques
- explain why rendering is required for 3-D modelling, animation or game development
- explain the requirements for using computer networks for rendering.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- appropriate computer hardware
- graphic rendering software
- input and output devices
- models and scenes to be rendered
- style shots
- briefs, specifications and schedules.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM417 Apply digital effects to interactive products

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply digital effects to an interactive product.

It applies to individuals who support the design, development and programming of basic digital games, as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and apply an interactive concept map of the production	1.1 Catalogue the individual components to be applied to the presentation 1.2 Identify, then apply, an interactive concept map showing the components in a logical layout and structure 1.3 Prepare an interactive storyboard for the production
2. Identify and apply digital effect components for the production	2.1 Identify the method for applying the digital effects framework to the presentation 2.2 Apply the framework for digital effects, using industry-standard methods 2.3 Refine the digital effects framework 2.4 Ensure that the framework conforms to project specifications
3. Identify and apply digital effect components for inclusion in the presentation	3.1 Identify the digital effect components for inclusion 3.2 Confirm that the digital effect components are in an appropriate format for the framework 3.3 Apply the digital effect components to the framework, for inclusion in the product presentation
4. Apply all components into a functioning and well-designed interactive product	4.1 Apply all the media components in the authoring environment 4.2 Identify the digital effects programming necessary to ensure satisfactory results 4.3 Identify any inconsistencies within the digital effects 4.4 Review and test the design, to ensure that it meets the creative and technical requirements of the brief 4.5 Apply the runtime version of the presentation, for inclusion into the product 4.6 Ensure that the presentation runs satisfactorily on all target platforms

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.4, 4.4	• Interprets a design brief containing complex effects and interactive design terminology • Interprets information in diagrams, icons, symbols, text, numbers and letters
Writing	1.1, 1.2	• Documents information on designs according to industry standards and organisational requirements
Numeracy	2.4, 4.1, 4.4	• Uses whole numbers, decimals and percentages relevant to measurement, resolution aspect ratio, pixel ratio, scale coordinates, colour, shading and other attributes/variables, in the application of digital effects • Interprets numerical information and applies basic mathematical calculations, relating to the time lines and budgetary information
Interact with others	1.1, 1.2, 1.3	• Constructs a message with some understanding of the purpose, audience needs and expectations, when developing a concept map and storyboard
Get the work done	All	• Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and uses these when applying digital effects

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM417 Apply digital effects to interactive products	ICAGAM417A Apply digital effects to interactive products	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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Assessment Requirements for ICTGAM417 Apply digital effects to interactive products

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare concept maps and storyboards according to requirements
- produce a functioning interactive product that:
  - meets a design brief
  - incorporates digital effects components
  - demonstrates use of effective and creative design principles
  - demonstrates use of visual communication principles.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the component-based programming skills required to produce interactive products
- describe the technical constraints that hardware or software imposes on design and development
- outline the techniques for applying:
  - concept development skills
  - concept visualisation skills
  - framework integration skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- appropriate computer hardware
- 3-D animation software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM418 Use simple modelling for animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and produce an animated sequence.

It applies to individuals who support the design, development and programming of basic digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clarify the animation requirements of models	1.1 Clarify the animation requirements and design specifications for the model, in consultation with the relevant personnel, and according to the production documentation 1.2 Examine the most appropriate animation techniques for the animation, in order to determine which modelling techniques to use 1.3 Identify the file format and delivery platform for animated sequences 1.4 Identify factors that may influence the animation design approach 1.5 Clarify work flow sequences, in consultation with the relevant personnel, to ensure that production schedule deadlines are met
2. Plan the approach	2.1 Research animations, artworks and other creative sources that may inspire visual design ideas 2.2 Generate a range of animation ideas that are technically feasible, respond to briefs, and provide creative solutions to all design issues 2.3 Present animation ideas to the relevant personnel using appropriate design techniques 2.4 Adjust the approach to incorporate feedback, and agree on final design concepts 2.5 Discuss and select animation software with the relevant personnel to ensure that the animated sequences of the model meet specified outcomes 2.6 Analyse audio assets supplied for animations, as required
3. Produce animated sequences for review	3.1 Create animations of models using animation and modelling techniques to suit design requirements 3.2 Apply basic animation principles, screen principles, visual design principles and communication principles 3.3 Apply real-world camera techniques to the virtual cameras used in the animation 3.4 Render the completed animated sequences 3.5 Save and store the animated sequences using appropriate output file formats, standard naming conventions, and

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ELEMENT	PERFORMANCE CRITERIA
	version-control protocols 3.6 Present the animated sequences of simple models to the relevant personnel for evaluation by agreed deadlines
4. Finalise animated sequences	4.1 Review the animated sequences to assess creative solutions to the design briefs, appropriateness to users or audience, and technical feasibility 4.2 Discuss and confirm with the relevant personnel, additional requirements or modifications, and complete any changes as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.1, 2.4, 2.5, 4.2	• Identifies, evaluates and interprets texts containing complex technical, 3-D modelling and animation terminology to clarify requirements and research ideas • Interprets and comprehends computer generated text, audio tracks, abbreviations, symbols, icons, numbers and letters necessary to use 3-D modelling and animation software
Oral Communication	1.1, 1.5, 2.1, 2.3, 2.4, 2.5, 3.6, 4.1, 4.2	• Participates in verbal exchanges of ideas and solutions, using a range of animation and 3-D modelling terminology, and effective listening and questioning techniques to clarify information • Presents designs speaking clearly and concisely, using specific terminology and appropriate non-verbal features
Numeracy	1.1, 1.4, 1.5, 2.2, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1	• Uses whole numbers, decimals and percentages relevant to file size, software and hardware specifications, measurement, scale, form, weight, volume, colour, shading, and other attributes/variables in the development of animated sequences
Get the work done	All	• Takes responsibility for planning, sequencing and prioritising tasks to achieve required outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and uses problem-solving processes to determine solutions • Contributes to improvement of work practices by applying the basic principles of analytical and lateral thinking • Uses digital technologies and systems to access information, enter data and code, present information and communicate with others

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM418 Use simple modelling for animation	ICAGAM418A Use simple modelling for animation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM418 Use simple modelling for animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create digital animated sequences of a model that:
  - demonstrates the principles of simple model animation, basic screen, visual design and communication
  - meets the technical requirements of specific platforms
  - satisfies the design brief and client requirements
  - meets the production deadlines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline basic digital animation techniques
- outline the principles of animation, screen, visual design and communication in relation to the production of animated sequences
- describe the features of a range of delivery platforms for animated sequences
- discuss the issues and challenges that arise in the context of creating models for digital animations
- outline the stages in the production process from initial design through to finished product
- outline the roles and responsibilities of project team members.

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Assessment Conditions

conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- appropriate computer hardware, software and games engines
- file storage
- design specifications and production documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM419 Build a database to support a computer game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, and to implement, a relational database for the management of the persisted- state world of a computer game.

It applies to individuals who work as game programmers or junior analyst programmers in the digital and interactive games industry, either as small independent specialists, or as part of a larger team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Verify the database model	1.1 Verify that the game architecture and system implementation requirements have been addressed by the proposed database architecture 1.2 Correlate data model entities and their attributes with the game artefacts, and the game design requirements 1.3 Verify that the entity relationships defined in the data model implement the game-design and game-play rules 1.4 Verify the estimates of the amounts of data storage required, and the data types defined by the data model 1.5 Document design inconsistencies 1.6 Review the database model and address, and correct any inconsistencies 1.7 Define the database test data
2. Create the physical database design	2.1 Implement the conceptual data model design as a physical database design 2.2 Determine the default database file size, according to the data model storage estimates 2.3 Determine game data input and output workload estimates 2.4 Determine the reliability and performance requirements 2.5 Define the minimum hardware requirements to support the input and output workload and reliability or performance requirements 2.6 Configure the database management system in order to use minimum hardware requirements 2.7 Refine and confirm the database test data
3. Implement the physical database prototype	3.1 Write structured query language (SQL) scripts to create physical database files according to the design requirements 3.2 Write SQL scripts to create database tables 3.3 Implement the primary key constraints 3.4 Implement the foreign key constraints 3.5 Define, and script, stored procedures for selecting, inserting, updating and deleting data

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Define and script insert statements for test data 3.7 Execute SQL scripts and database, including test data
4. Test the database and document results	4.1 Document the entity integrity tests, and results 4.2 Document the referential integrity tests, and results 4.3 Document the input and output performance tests, and results 4.4 Document the stored procedures tests, and results
5. Review, evaluate and correct database performance	5.1 Review the test result deficiencies 5.2 Define, evaluate and test the deficiencies, and ensure that corrective measures are implemented 5.3 Implement corrections to the database

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 1.6, 2.2, 2.3, 2.4, 2.5, 2.7, 5.1	• Interprets and analyses documents containing complex games-design and database-architecture terminology, to determine database requirements and identify design inconstancies • Interprets and comprehends a large range of diagrams, flow charts, code, syntax, icons, symbols, text, numbers and letters necessary to design and develop a database
Writing	1.5, 1.7, 2.1, 3.1, 3.2, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4	• Uses correct spelling and grammar, plain English, specific terminology and appropriate document layout, when documenting database test data and test results • Uses the appropriate programming code, syntax and conventions to develop the database
Oral Communication	1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 2.4	• Employs effective listening and open-questioning techniques to clarify design requirements and project scheduling, and to obtain feedback
Numeracy	1.1-1.7, 2.1-2.7, 3.1-3.7	• Uses a wide range of applied mathematical calculations and functions to design, develop, and evaluate the database
Get the work done	All	• Plans a range of routine, and some non-routine, tasks, aiming to achieve required outcomes efficiently and effectively • Makes a range of critical and non-critical decisions in relatively complex situations, using analytical processes to decide on appropriate courses of action • Evaluates outcomes to identify opportunities for improvement within own work context • Utilises a broad range of features within applications to complete required tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM419 Build a database to support a computer game	ICAGAM419A Build a database to support a computer game	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM419 Build a database to support a computer game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret a conceptual database model
- create a database from a conceptual model, that allows for the persistence of state data for a computer game
- evaluate, and improve, the performance of a database built to support a computer game.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify computer hardware specifications and performance required to support database development
- discuss the creation, use and testing of stored procedures
- explain why input and output parameters are required
- explain database stress testing and stress testing software
- discuss the principles of database testing methodologies
- describe object-oriented database management systems
- discuss the similarities and difference between relational database management systems:
  - IBM DB2
  - Microsoft Access
  - Microsoft SQL (MS SQL) server
  - MySQL
  - Oracle
  - Postgre Structured Query Language (Postgre SQL)
- discuss relational database modelling building blocks and theory, including attributes, entity relationship modelling and normalisation of database tables
- discuss relationship cardinality and connectivity:
  - 1:1
  - 1:M
  - M:N
- outline the features, and functions, of structured query language (SQL), including data definition language and data manipulation language
- discuss the evolution of relational database management systems and their relationship to the flat file, hierarchical, and network data storage legacy of games
- outline the important functions of a relational database management system within the context of a computer game
- interpret data access languages, such as SQL and language-integrated query (LINQ)
- interpret data application programming interfaces (APIs) including:
  - ADO.Net
  - data integrity
  - disaster recovery and backups
  - data dictionary
  - data storage
  - security requirements of the data
  - transforming and presenting the data
- discuss the importance of data models
- describe the different types of data models, including Chen and Crow's Foot models
- describe the relationship between game-play rules and the modelling of the database structure.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer-aided software engineering and modelling tools
- a relational or object-oriented database management system
- performance testing and analysis software for selected database management system/ game architecture specifications
- the game design and requirements documentation
- the client or server hardware
- networking infrastructure sufficient to simulate the game architecture specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM501 Create design concepts for digital games and 3-D media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to work innovatively in game development, using thoughtful strategies and well-developed technical skills to accommodate a specified design brief.

It applies to individuals who support the design, development and programming of interactive 3-D media and digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and analyse commonly used design concepts for games and 3-D media	1.1 Obtain the project brief and other relevant organisational documents and procedures 1.2 Research and identify commonly used design concepts in digital games and interactive 3-D media 1.3 Analyse and interpret chosen common design concepts used in digital games and interactive 3-D media 1.4 Discuss design considerations for designing a digital game or an interactive 3-D media concept
2. Identify appropriate software packages used for a digital game and 3-D concept design	2.1 Identify and review the appropriate range of industry-standard software available to develop design concepts 2.2 Assess the software related to the concept design process requirements 2.3 Discuss the technical specifications for the development process 2.4 Select the software package
3. Use a chosen software package	3.1 Run the selected software package and become familiar with the user interface 3.2 Create new files, organise and develop a file structure 3.3 Learn the required tools and components used to create, and develop a digital game, or interactive 3-D media concept
4. Create and develop the concept components for a digital game or interactive media	4.1 Design a heads-up display for a digital game or 3-D interactive media 4.2 Consider specific processes for the heads-up display elements 4.3 Document the design, necessary programming process and requirements needed to implement the heads-up display 4.4 Use the chosen software package to create and develop the visual design elements, and components, to be used for the heads-up display
5. Implement a design concept into a game or 3-D interactive media	5.1 Load in the images required and write the code to implement the heads-up display into an existing framework 5.2 Write code to demonstrate heads-up display capabilities with implemented concepts

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ELEMENT	PERFORMANCE CRITERIA
6. Evaluate the implementation	6.1 Demonstrate implementation to the relevant personnel 6.2 Accept feedback to incorporate into the final design 6.3 Assess and refine the concept with the relevant personnel 6.4 Evaluate the usability of the concept's components 6.5 Reflect on possible changes to improve the visual design and capabilities of the components

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.3	• Uses a range of investigative and analysis techniques to acquire the knowledge needed to use tools, and other components, effectively for digital games and 3-D media production
Reading	1.1, 1.3	• Interprets and comprehends a large range of textual and diagrammatic information to inform instructional, technical, and conceptual requirements
Writing	1.1, 3.2, 4.1, 4.3, 5.1, 5.2, 6.2, 6.3	• Uses correct spelling and grammatical structures, clear language, and technical terminology when explaining technical and design requirements
Oral Communication	1.1, 1.4, 2.3, 6.2	• Elicits information using effective listening and open questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology into plain English, when providing information
Numeracy	4.1, 4.3, 4.4	• Uses whole numbers, decimals and percentages, when manipulating software to achieve the required technical and design components
Interact with others	6.1, 6.3	• Cooperates and collaborates with others as part of routine activities, and to elicit support and feedback
Get the work done	1.1-1.4, 2.1-2.4, 3.1-3.3, 4.1-4.4, 5.1, 5.2, 6.1-6.5	• Actively sources, analyses and evaluates applications, with the potential to meet 3-D design requirements • Understands the purposes and uses the key features of specific digital systems, and tools, and operates them effectively to complete design tasks • Understands the importance of file structure, and takes responsibility for data integrity and management • Uses creativity and initiative in 3-D design • Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Uses a systematic process to evaluate work and to implement improvements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM501 Create design concepts for digital games and 3-D media	ICAGAM501A Create design concepts for digital games and 3-D media	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM501 Create design concepts for digital games and 3-D media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- demonstrate original and innovative approaches to the creative development of a game
- implement game development and production strategies
- maintain the integrity of the design brief
- develop concept art and design specifications for heads-up displays, splash screens, start screens and game field screens, consistent with an identified game genre
- develop technical specifications for game mechanics, artificial intelligence, physics, sound, game play and overall usability
- implement a working heads-up display with basic functionalities.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain basic programming techniques
- discuss the capabilities and constraints of game engines
- outline concept development and visualisation skills
- discuss computer game development, including specific terminology
- describe current game-play hardware and software products
- outline the human resources required in the process of creating a game and their respective skills and technology requirements
- summarise work health and safety (WHS) requirements for:
  - ergonomics
  - electrical safety
- discuss risk and critical path management
- summarise the technical constraints that hardware imposes on:
  - software development
  - graphics requirements
  - code development
  - creative visual design.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM503 Create a complex 3-D interactive computer game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use original and innovative ideas, and industry-standard production techniques, to create functional games according to a specific design brief.

It applies to individuals who support the design, development and programming of interactive 3-D media, and digital games, as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the required game assets in a team environment	1.1 Obtain the project brief and other relevant documents 1.2 Identify the game production assets required to meet the creative and production requirements, and technical specifications 1.3 Discuss the formats of assets, and issues of asset integration, with the appropriate personnel 1.4 Determine the sequence for the development of a beta-version prototype for testing game play 1.5 Create a schedule for production and testing 1.6 Determine strategies for monitoring production progress against the schedule
2. Identify the capability of game-engine software and tools and make a selection in a team environment	2.1 Identify and review the range of industry-standard game-engine software and development tools available 2.2 Assess the software and tools related to the specified game concept and play requirements 2.3 Discuss considerations for the selection of game-engine software with the relevant personnel, to ensure that the selection will meet the specified outcomes 2.4 Select the game-engine software and development tools
3. Create or acquire the required assets for a game in a team environment	3.1 Establish an environment for a project that supports sharing of project assets produced by team members 3.2 Review the attributes of the assets required in a game project related to the chosen game engine 3.3 Create or acquire the visual assets for a games project 3.4 Customise asset attributes to suit the game design, and chosen game engine
4. Use game-engine software and development tools in a team environment	4.1 Collaborate in the use of tools, and features, of software relevant to the game-production process 4.2 Create, modify or access scripts or code to combine assets, and achieve agreed project goals 4.3 Create and check game-play elements, according to the creative and technical requirements 4.4 Test and run the game prototype as a presentation, to ensure

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ELEMENT	PERFORMANCE CRITERIA
	that sequences meet the creative, production and technical requirements
5. Evaluate the game prototype in a team environment	5.1 Demonstrate the initial prototype to the relevant personnel 5.2 Evaluate against criteria, including the achievement of a creative and user-friendly product 5.3 Discuss and agree on required changes 5.4 Assist, if required, in tests and user trials 5.5 Evaluate the feedback from user trials 5.6 Confirm the endorsement from relevant personnel to develop the prototype into a complete product
6. Transform the prototype into final publication	6.1 Make the necessary changes, as indicated by user trials 6.2 Integrate all game elements, as required by the specifications 6.3 Make final checks to ensure that all sequences conform to the navigation design 6.4 Assemble a final publication for distribution

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.1, 4.2, 4.3, 6.2, 6.3	• Interprets and comprehends a large range of textual and diagrammatic information, to inform instructional, technical and conceptual requirements
Writing	4.2, 5.5, 5.6, 6.4	• Uses correct spelling and grammatical structures, clear language, and technical terminology when explaining technical and design requirements
Oral Communication	1.3, 2.3, 5.5, 5.6	• Elicits information using effective listening and open questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology into plain English, when providing feedback and other information
Numeracy	1.5, 4.1, 4.2, 4.3, 4.4	• Uses whole numbers, decimals and percentages when manipulating software, to achieve the required technical and design components • Defines timeframes in accordance with the schedule requirements
Interact with others	3.1, 4.1, 5.1, 5.3, 5.4, 5.6	• Cooperates and collaborates with others as part of routine activities to achieve team results, and to confirm that the outcomes meet the requirements
Get the work done	1.1-1.6, 2.1-2.4, 3.1-3.4, 4.1-4.4, 5.1-5.6, 6.1-6.4	• Actively sources, analyses and evaluates applications, tools, and assets for the potential to meet creative requirements • Understands the purposes, and uses key features, of specific digital systems and tools, and operates them effectively in order to complete design tasks • Uses creativity and initiative in game design • Plans, organises, and completes work according to defined requirements and schedules, taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Uses a systematic process to evaluate work and to implement improvements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM503 Create a complex 3-D interactive computer game	ICAGAM503A Create a complex 3-D interactive computer game	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM503 Create a complex 3-D interactive computer game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine required game assets
- apply a variety of strategies for game trialling and testing
- apply original and innovative approaches to the creative development of a 3-D game
- implement game development and production strategies
- maintain the integrity of the design brief and game design document
- communicate, collaborate and participate in a team environment
- transform the prototype into final publication.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain basic programming techniques
- summarise the capabilities and constraints of game engines
- discuss the process used for computer games development, including specific terminology
- provide a detailed summary of current game-play hardware and software products
- explain risk and critical path management
- outline technical constraints that hardware imposes on:
    - graphics requirements
    - code development
    - creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM504 Manage interactive media production

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage interactive media or game production.

It applies to individuals who manage personnel in the interactive media or game development industry who may be concept artists, designers, programmers, animators and others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Attend to the placement of staff for a digital media production	1.1 Undertake the work placement of a production team 1.2 Ensure punctuality and appropriate dress 1.3 Follow organisational guidelines to support workplace culture, and the corporate image
2. Monitor workplace structure and staff responsibilities	2.1 Identify the duties carried out by various personnel 2.2 Observe the lines of reporting and communication 2.3 Determine the responsibilities of own area or department
3. Identify appropriate behaviours and attitude	3.1 Apply communication skills to interact effectively with other staff and clients 3.2 Demonstrate behaviour that reflects the organisational culture
4. Carry out tasks within the range or context specified for the workplace	4.1 Complete set tasks according to instructions and deadlines 4.2 Discuss any problems or concerns with assigned work with the supervisor or a mentor
5. Report on workplace experience	5.1 Maintain a log book that records daily activities 5.2 Complete a short report of the work experience

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1, 4.1	• Interprets and comprehends instructions, including textual and diagrammatic information to inform job requirements
Writing	1.3, 3.1, 5.1, 5.2	• Uses correct spelling and grammatical structures, clear language, and technical terminology when recording activities and writing reports
Oral Communication	3.1, 4.2	• Elicits information using effective listening and open questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information
Navigate the world of work	1.1-1.3, 2.1-2.3	• Draws on a repertoire of experience to facilitate understanding of the culture and the environment
Interact with others	1.2, 1.3, 3.1, 3.2, 4.2	• Cooperates and collaborates with others as part of routine activities, and to elicit support and feedback • Collaborates with others sharing information to build strong connections, demonstrating behaviours reflective of organisational culture
Get the work done	4.1, 5.1, 5.2	• Plans, organises and completes work according to defined requirements and schedules, taking responsibility for decisions, and scheduling tasks to achieve efficient outcomes • Responds intuitively to problems requiring immediate resolution, drawing on past experiences to focus on the cause of a problem rather than the symptom

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM504 Manage interactive media production	ICAGAM504A Manage interactive media production	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM504 Manage interactive media production

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor behaviour of self and others to ensure compliance with the workplace culture
- operate according to the lines of reporting and required method of communication
- allocate tasks to appropriate staff members
- plan and complete assigned tasks in a production environment, to meet deadlines
- demonstrate effective communication, listening and questioning skills with various people, including use of industry terminology.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise basic 3-D techniques
- explain the budgeting and scheduling considerations for 3-D design
- discuss capabilities and constraints of 3-D packages
- outline current game-play hardware and software products
- discuss the technical constraints that hardware or software imposes on graphics and visual design
- explain the process required to produce a 3-D animation sequence or components
- summarise the roles and responsibilities of team members producing 3-D animations and digital effects
- summarise effective strategies for communicating with production teams and clients.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- an environment where interactive media production may be carried out
- organisational guidelines and policies
- relevant people.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM506 Create complex code for mobile game devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create complex code for mobile game devices.

It applies to individuals working as programmers who support the design, development and programming of interactive 3-D media and digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and identify appropriate implementations for complex code for mobile game devices	1.1 Obtain, or create, a mobile game device framework 1.2 Identify the tools and technology for creating applications for mobile game devices 1.3 Research and identify the appropriate game physics implementation, for a mobile game device 1.4 Research and identify the appropriate artificial intelligence (AI) implementation, for a mobile game device 1.5 Research and identify the appropriate shaders, for a mobile game device 1.6 Identify the technical limitations and constraints of the mobile device within the game
2. Implement physics code for mobile game devices	2.1 Develop the code for simulating velocity and momentum 2.2 Develop the code for simulating acceleration and gravity 2.3 Develop the code for simulating frictional effects 2.4 Develop the code for simulating collisions and collision detection 2.5 Implement the code for game physics in the mobile game device
3. Develop and implement AI for mobile game devices	3.1 Use finite state machines to model behaviour 3.2 Develop path-finding algorithms 3.3 Develop code based on a genetic algorithm 3.4 Implement the code for AI in the mobile game device
4. Develop and implement the shader for mobile game devices	4.1 Develop code based on the shading algorithm 4.2 Implement the shading algorithm code in the mobile game device

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.4	• Interprets and comprehends instructions, briefs, technical and conceptual information to inform job requirements
Numeracy	1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3, 3.4, 4.1, 4.2	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other variables
Get the work done	1.1-1.6, 2.1-2.5, 3.1-3.4, 4.1, 4.2	• Plans, organises and completes work according to defined requirements and schedules, taking responsibility for decisions, and scheduling tasks to achieve efficient outcomes • Uses a high level of creativity and initiative in coding • Actively sources, analyses and evaluates tools and technologies with the potential to meet requirements • Understands the purposes and uses key features of specific digital systems and tools, and operates them effectively to complete coding tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM506 Create complex code for mobile game devices	ICAGAM506A Create complex code for mobile game devices	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM506 Create complex code for mobile game devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use research to determine appropriate implementations for mobile game devices
- develop and implement the code for game physics in a mobile device
- develop and implement the artificial intelligence for a mobile device
- develop and implement shading algorithms for a mobile device.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss relevant programming techniques
- outline the budgeting and scheduling considerations for game design
- outline the capabilities and constraints of game engines
- discuss computer game development, including specific terminology
- outline the concept development
- describe the concept visualisation
- provide a detailed summary of current game-play hardware and software products
- outline environmental impact and sustainability considerations
- discuss the human resources required in the process of creating a game, and describe the team's respective skills and technology requirements
- explain risk and critical path management
- provide a detailed explanation of the technical constraints that hardware imposes on:
  - software development
  - graphics requirements
  - code development
  - creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM507 Develop intermediate 3-D software for games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop intermediate 3-D software for games or interactive media.

It applies to individuals working as programmers who support the design, development and programming of interactive 3-D media and digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Build a 3-D application using a provided framework or engine	1.1 Employ integrated development environment facilities to include existing 3-D libraries suitable for games or interactive media production 1.2 Use existing library facilities and appropriate language, to facilitate the configuration of a 3-D environment compatible with a specified platform 1.3 Instantiate virtual objects in a simple 3-D environment 1.4 Create mesh primitives using 3-D library routines 1.5 Generate code to manipulate 3-D objects, including cameras, lights and mesh primitives 1.6 Import pre-constructed meshes from persistent storage into a 3-D environment, using scripts or library routines 1.7 Apply class inheritance to modify or extend existing 3-D class 1.8 Select and apply, exception handling techniques to ensure program stability in a simple 3-D environment
2. Create a graphical user interface (GUI) for a 3-D environment	2.1 Employ integrated development environment facilities to include existing 3-D compatible graphical user interface (GUI) controls suitable for games, or interactive media production 2.2 Combine predefined GUI elements to create a simple interface for a 3-D environment 2.3 Modify scripts or code to customise existing GUI elements 2.4 Write code that processes events raised by a GUI in a 3-D environment 2.5 Create GUI events to modify the configuration of a simple 3-D environment
3. Debug a 3-D application	3.1 Use stand-alone debugging tools, or tools provided by an integrated development environment, to examine variables and trace running code 3.2 Use debugging facilities, such as log windows or files, to detect logical and coding errors
4. Deploy documentation tools	4.1 Investigate and select integrated, or third-party, documentation tools 4.2 Deploy integrated, or third-party, tools to create and maintain

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ELEMENT	PERFORMANCE CRITERIA
	code documentation

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 3.1, 3.2	• Interprets and comprehends instructions, briefs, technical and conceptual information, to inform job requirements
Writing	1.2, 1.5, 2.3, 2.4	• Writes and customises precise code using the required language, industry-approved coding techniques, and programming practices
Numeracy	1.5, 2.3	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other variables
Get the work done	1.1-1.8, 2.1-2.5, 3.1, 3.2, 4.1, 4.2	• Plans, organises and completes work according to defined requirements, and schedules, taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Actively sources, analyses and evaluates applications or tools with the potential to meet development requirements • Understands the purposes, and uses key features, of specific digital systems and tools, and operates them effectively to complete development tasks • Takes responsibility for data integrity and management

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Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Configuration of a 3-D environment must include:	• device selection • game resolution • screen colour depth • output performance, including: • anti-aliasing • level of detail • filtering • caustics and refraction.
Virtual objects must include:	• cameras • lights • viewports.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTGAM507 Develop intermediate 3-D software for games and interactive media	ICAGAM507A Develop intermediate 3-D software for games and interactive media	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM507 Develop intermediate 3-D software for games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create at least one 3-D framework or library that includes an appropriate graphical user interface (GUI)
- check for coding errors and debug the application
- select and deploy documentation tools
- create documentation generated by appropriate tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain 3-D application development
- provide a detailed explanation of debugging techniques
- outline documentation techniques
- discuss object-oriented 3-D programming concepts and language.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and must include access to:

- suitable 3-D hardware and software
- technical materials and manuals
- the detailed 3-D framework, or engine, on which to build the application.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM508 Develop complex 3-D software for games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to employ multiple 3-D frameworks or libraries, and build an appropriate graphical user interface (GUI) to develop complex 3-D applications with documentation generated using appropriate tools.

It applies to individuals working as games programmers who support the design, development and programming of 3-D media and digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Build complex 3-D applications using multiple frameworks provided or engines	1.1 Employ integrated development environment facilities to include existing 3-D, audio and physics libraries suitable for games or interactive media production 1.2 Configure a 3-D environment compatible with a specified platform by using existing library facilities and appropriate language 1.3 Instantiate virtual objects in a complex 3-D environment 1.4 Import complex pre-constructed models retrieved from persistent storage into a 3-D environment using scripts or library routines 1.5 Use code to animate 3-D objects required by game play 1.6 Use code to handle collisions between objects in a 3-D environment 1.7 Use code to manipulate the texturing and other attributes of models during run-time execution 1.8 Incorporate environmental elements to enhance user experience 1.9 Select and use appropriate exception handling techniques to ensure program stability in a complex 3-D environment that uses multiple libraries
2. Create a complex graphical user interface (GUI) for a 3-D environment	2.1 Employ integrated development environment facilities to include existing 3-D compatible GUI controls suitable for complex games or interactive media production 2.2 Combine predefined GUI elements to create a complex interface for a 3-D environment 2.3 Modify scripts or code to customise existing GUI elements for a complex interface 2.4 Write code that processes events raised by a complex GUI in a 3-D environment 2.5 Use GUI events to modify the configuration of a complex 3-D environment
3. Debug a complex 3-D application	3.1 Use stand-alone debugging tools or tools provided by an integrated development environment to examine variables and trace running code across multiple libraries

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ELEMENT	PERFORMANCE CRITERIA
	3.2 Employ debugging facilities, such as log windows or files to detect logical and coding errors
4. Use documentation tools	4.1 Identify and choose suitable integrated or third-party documentation tools 4.2 Create and maintain code documentation for a complex 3-D project using selected integrated or third-party tools

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4	• Interprets and comprehends instructions, briefs, technical and conceptual information, to inform job requirements
Writing	1.2, 1.5, 1.6, 1.7, 2.3, 2.4, 4.2	• Writes and customises precise code using specialised language, industry-approved coding techniques, and programming practices
Numeracy	1.5-1.7, 2.3, 2.4	• Uses whole numbers, decimals, and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other variables
Get the work done	1.1-1.9, 2.1-2.5, 3.1, 3.2, 4.1, 4.2	• Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Actively sources, analyses and evaluates applications, or tools, with the potential to meet development and coding requirements • Understands the purposes and uses key features of specific digital systems and tools, and operates them effectively to complete complex development tasks • Takes responsibility for data integrity and management

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Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Configure a 3-D environment must include:	• device selection • game resolution • screen colour depth • output performance including: • anti-aliasing • level of detail • filtering • caustics and refraction.
Virtual objects must include:	• audio managers • cameras • lights • physics managers • viewports.
Animate must include:	• animation selection/playback for pre-constructed models • based on user input • driven by code • dynamic camera movement as required by game play.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTGAM508 Develop complex 3-D software for games and interactive media	ICAGAM508A Develop complex 3-D software for games and interactive media	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM508 Develop complex 3-D software for games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- employ multiple 3-D frameworks, engines and libraries
- build a complex graphical user interface (GUI) for a 3-D environment
- create and maintain code documentation, using appropriate tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed explanation of complex 3-D application development
- outline debugging techniques
- summarise documentation techniques
- explain object-oriented 3-D programming concepts
- describe object-oriented 3-D programming language
- discuss techniques for using a GUI to interact with a user
- describe techniques for using multiple games-oriented libraries.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- suitable 3-D equipment
- software and hardware
- technical manuals
- existing multiple frameworks, search engines or games-oriented libraries.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design interactive 3-D applications for scientific and mathematical modelling.

It applies to individuals with object-oriented programming skills working in any industrial context that requires 3-D computer simulation of a well-defined environment, system or set of relationships.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine and confirm business expectations and needs	1.1 Apply skills to determine business requirements and verify the accuracy of the information gathered 1.2 Determine the critical environmental, systemic relationships that require simulation in a 3-D environment 1.3 Identify critical data sources required by simulations or modelling 1.4 Document critical environmental, systemic relationships and data sources that require simulation in a 3-D environment
2. Design an interactive 3-D application for scientific or mathematical modelling	2.1 Use prototyping tools to provide proof of concept for environmental and systemic relationships 2.2 Identify technologies and platforms suitable for the deployment of scientific or mathematical modelling 2.3 Apply object-oriented programming principles to design classes and algorithms to support scientific or mathematical modelling in an interactive 3-D environment
3. Design a 3-D environment that simulates a scientific or mathematical model	3.1 Select appropriate visual representation for elements of a 3-D scientific or mathematical model 3.2 Analyse required interaction between user and a 3-D environment 3.3 Design a graphical user interface (GUI) to support required interaction between use and a 3-D environment
4. Develop procedures to test a scientific or mathematical model	4.1 Develop testing procedures and standards that verify modelling integrity writing, 4.2 Document testing procedures and standards that verify modelling integrity

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets, analyses and comprehends instructions, briefs, technical and conceptual information to inform job requirements.
Writing	1.4, 2.3, 4.1, 4.2	• Writes and customises precise code using specialised language, industry-approved coding techniques, and programming practices • Verifies modelling integrity, by documenting testing procedures that explore expected results, parallel processing and test data
Numeracy	2.2, 2.3, 3.3, 4.1, 4.2	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other variables during application phase • Designs complex algorithms
Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.3, 4.1, 4.2	• Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Takes responsibility for decisions regarding end-product evaluation, data integrity and management • Understands the purposes and uses key features of specific digital systems and tools, and operates them effectively to complete development tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling	ICAGAM509A Design interactive 3-D applications for scientific and mathematical modelling	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine business requirements and select data to be used in a 3-D computer simulation or mathematical modelling application
- design an interactive 3-D environment that reflects scientific or mathematical modelling
- develop and document testing procedures and standards to verify modelling.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed explanation of documentation techniques
- outline object-oriented 3-D programming design methodologies
- summarise object-oriented 3-D programming principles
- discuss data sources and business expectations and needs
- explain techniques for using a graphical user interface (GUI) to interact with a user
- provide a detailed summary of testing procedures
- describe how 3-D technologies can simulate scientific or mathematical models.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- suitable 3-D equipment, software and hardware
- technical manuals
- examples of scientific or mathematical models.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM510 Prepare games for different platforms and delivery modes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build, maintain and test games across multiple system platforms.

It applies to individuals with games programming skills, and other personnel, working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Produce a game package for multiple platforms	1.1 Research and identify cross-platform installers 1.2 Use an installer to package a game for multiple platforms
2. Develop a cross-platform project	2.1 Identify the cross-platform integrated development environment (IDE) 2.2 Identify cross-platform renderer libraries, physics libraries, audio libraries and network libraries 2.3 Source or compile cross-platform libraries 2.4 Compile a project for multiple platforms 2.5 Test and maintain the cross-platform software project 2.6 Use platform-specific input devices
3. Compile a report on cross-platform software development	3.1 Identify and document issues in cross-platform development 3.2 Develop an awareness of cross-platform hardware

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.2	• Extends understanding of delivery modes and platforms by incorporating the results of trialling and testing
Reading	1.1, 2.1, 2.2	• Interprets, analyses and comprehends complex instructions, briefs, numerical code, technical data, and conceptual information, to inform job requirements
Writing	3.1	• Prepares evaluative material for a specific audience using clear and detailed language to convey information and requirements
Get the work done	1.1, 1.2, 2.1-2.6, 3.1	• Plans, organises and completes work according to defined requirements and schedules, sequencing tasks to achieve efficient outcomes • Uses systematic, analytical processes in complex, routine and non-routine situations gathering information, identifying potential solutions, and evaluating options • Takes responsibility for decisions regarding end-product testing and data integrity, and management • Actively sources applications or tools with the potential to meet development requirements

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM510 Prepare games for different platforms and delivery modes	ICAGAM510A Prepare games for different platforms and delivery modes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM510 Prepare games for different platforms and delivery modes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a cross-platform game project
- identify and use cross-platform integrated development environment (IDE) libraries and installers
- test and maintain a cross-platform project
- document issues identified for cross-platform development.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise current cross-platform IDEs
- explain evaluation techniques for cross-platform development libraries
- summarise research methods for cross-platform development and distribution
- outline testing procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- computers running various operating systems
- IDEs and libraries
- installers for product distribution
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM511 Manage testing of games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to define requirements and manage the testing of games, and interactive media, to enable timely product release.

It applies to individuals who ensure the delivery of well-tested, quality software products in the marketplace.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the quality requirements statement that will enable product release	1.1 Review the picture of the product in the market place to determine high-level requirements provided by the product, for expected clients, considering all types of requirements 1.2 Define a releasable product in terms of outstanding bugs, to enable a limited release and a complete product release 1.3 Summarise findings into a product release, enabling quality requirements statement 1.4 Confirm that the client requirements and development specifications are in agreement for product release, to enable the preparation of a quality requirements statement
2. Define test plan that enables testing of required quality as defined by quality requirements statement	2.1 Determine expected test cycles during the software development life cycle, considering the development methodology in use and the quality requirements for the product's release 2.2 Determine the types of testing to be performed during the test cycles, to enable the efficiency of processes, and the confirmation of the quality requirements statement 2.3 Determine the testing methods to be used to implement the testing types defined for the identified test cycles 2.4 Determine the testing technique to be used to determine test cases, and analyse results 2.5 Perform the test cycle until a combination is found that provides an acceptable balance of cost, quality and risk, and on which upper management and development team can agree 2.6 Select test-support software to enable efficiency in testing and testing management 2.7 Define implementation details for agreed testing and the team responsible for testing management 2.8 Define reporting details for testing throughout the product life cycle to enable ongoing management of the testing process 2.9 Confirm test plan completeness using available completeness techniques 2.10 Confirm the test plan with development team and management
3. Install and configure	3.1 Install and configure the bug tracking process, and define bug

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ELEMENT	PERFORMANCE CRITERIA
test plan defined test support software	description fields to maximise efficiency, and minimise possibilities of bouncing bugs 3.2 Install and configure test case management software 3.3 Install and configure test cycle management and reporting software 3.4 Install and configure automated test tools
4. Manage testing process to enable defined quality requirements	4.1 Manage and report on the development of test cases 4.2 Manage and report on test cycle status 4.3 Manage and report on outstanding bug status 4.4 Manage and report on the status of product testing related to product release, enabling a quality requirements statement 4.5 Update the test plan and schedule to deal with changing development conditions, and to ensure that management is informed 4.6 Manage bugs to ensure efficient bug handling and resolution 4.7 Manage the test environment, including setup, receipt of test builds and clean-up
5. Finalise testing for release	5.1 Produce testing results for management review prior to release 5.2 Manage test product freeze for final release and final test run 5.3 Confirm the product, release enabling, and ensure that quality requirements have been met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 2.4	• Interprets analyses and comprehends product expectations, and conceptual information to inform job requirements
Writing	1.3, 2.7, 2.8, 2.9, 2.10, 3.1, 4.1, 4.2, 4.3, 4.4, 4.5, 5.1	• Prepares technical documentation and reports for specific audiences, using clear and detailed language, and numerical data, in order to convey explicit information and requirements
Oral Communication	1.4, 2.7, 2.8, 2.9, 2.10, 4.1, 4.2, 4.3, 4.4, 4.5, 5.3	• Elicits information using effective listening and open questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information
Numeracy	2.5	• Interprets budgetary information to enable decision-making during the product test-cycle
Get the work done	1.1-1.4, 2.1-2.10, 3.1-3.4, 4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 5.2, 5.3	• Plans, organises and completes work according to defined requirements and schedules, sequencing tasks to achieve efficient outcomes • Makes critical decisions systematically in complex situations, taking into consideration a range of variables, including the outcomes of previous decisions • Evaluates effectiveness of products to inform strategic decisions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM511 Manage testing of games and interactive media	ICAGAM511A Manage testing of games and interactive media	Updated to meet Standards for Training Packages	Equivalent unit

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Companion volumes available from the IBSA website:
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Assessment Requirements for ICTGAM511 Manage testing of games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define quality requirements and an associated test plan for software
- install and configure testing support software
- manage the testing process
- identify bugs or issues, accurately and concisely
- finalise the software testing process to enable the product release.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed summary of client requirements for platforms, hardware and software
- provide a detailed explanation of client system requirements, both functional and non-functional
- outline the procedures for bug or issue management and identification
- summarise test reporting requirements
- explain testing techniques, methods, test types and system dissection.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- a system undergoing development with the associated specifications
- client requirements (verbal or written) for system quality requirements
- testing support software
- a test environment.

Assessors must satisfy NVR/AQTF assessor requirements.

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Companion volumes available from the IBSA website:
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ICTGAM512 Create and implement designs for a 3-D games environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create and implement designs within the context of a 3-D games environment.

It applies to individuals with highly developed communication and technical skills working as concept artists, game designers, games programmers, animators, and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the technologies to be used with 3-D games development	1.1 Discuss and decide on 3-D modelling software for the production of designs, and ramifications of choice with the relevant personnel 1.2 Discuss and decide on 2-D image-editing software for textures with relevant personnel 1.3 Establish 3-D production considerations for available computer hardware
2. Develop design documentation for 3-D effects	2.1 Establish a theme for design, and determine the required modelling assets 2.2 Create a file archiving system for the storage of 3-D components, models and versions 2.3 Establish the project development pipeline and production deadlines, to meet assessment dates
3. Develop and create storyboards	3.1 Create a storyline for animation 3.2 Develop storyboard that implements the storyline document 3.3 Review and finalise the storyboard document for implementation
4. Develop and create projects	4.1 Create a new document and conduct the creation of models as outlined in the production pipeline, theme, and storyboard documents 4.2 Archive the project as specified by the assignment criteria for submission

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.2, 3.3, 4.1, 4.2	• Interprets analyses and comprehends conceptual information to inform job requirements
Writing	2.2, 3.1-3.3, 4.1	• Transforms creative ideas into readily-understood information for specific audiences, using clear and detailed language • Develops material regarding the advantages, and limitations of, different technologies using explicit language to convey information and requirements
Oral Communication	1.1, 1.2	• Elicits information using effective listening and open questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.3, 4.1, 4.2	• Actively sources, analyses, and evaluates applications with the potential to meet 3-D game design requirements • Uses key features, of specific digital systems and tools to complete design tasks • Understands the importance of file structure, and takes responsibility for data integrity and management • Uses creativity and initiative in 3-D game design • Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes • Uses a systematic process to evaluate work and implement improvements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM512 Create and implement designs for a 3-D games environment	ICAGAM512A Create and implement designs for a 3-D games environment	Updated to meet Standards for Training Packages. Minor edits to clarify intent of the performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM512 Create and implement designs for a 3-D games environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use discussion to identify the most appropriate technology for 3-D games development
- create and develop design documents for 3-D effects, including timelines for completion and file archiving system
- develop and use a storyline and storyboard to produce a 3-D games project.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the concepts of animation techniques
- explain the concepts of digital effects generation
- discuss and evaluate 2-D and 3-D graphics editing software and their common concepts
- provide a detailed summary of appropriate graphics formats for 3-D games.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM514 Design and create models for a 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and create models for a 3-D and digital effects environment using complex topology, specified geometry surfaces, and advanced model builds.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators, and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design and plan a 3-D model	1.1 Research and collect a portfolio of reference material 1.2 Present the portfolio of collected reference material 1.3 Use reference material to develop and design a modelling plan
2. Use suitable geometry surface for models	2.1 Research the different types of geometry to select the most suitable for a 3-D model 2.2 Clearly document the selected geometry choice 2.3 Explain, justify and demonstrate the reasons for the selected geometry choice 2.4 Apply the selected geometry choice to 3-D model 2.5 Make changes to the geometry selection where necessary
3. Analyse the resource material to construct and apply a suitable topology	3.1 Construct and test a topology plan using chosen concept development software 3.2 Explain or demonstrate the reason for choosing a particular modelling method 3.3 Assess and refine the topology plan with the client and relevant personnel
4. Construct a 3-D model	4.1 Use a modelling plan to construct the model, in the chosen 3-D modelling and animation software 4.2 Build the model, according to specifications 4.3 Present the near-finished product to the relevant personnel 4.4 Accept feedback to incorporate into the final design 4.5 Assess and refine the model with clients and the relevant personnel 4.6 Compose a report on the experience of working on a 3-D model

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 4.1, 4.2	• Interprets, analyses, and comprehends conceptual and specification information to inform job requirements • Organises, evaluates and critiques ideas and information, from a range of complex texts, to determine which geometry and topology will best suit the 3-D model
Writing	1.2, 1.3, 2.2, 2.3, 3.2, 3.3, 4.4, 4.5, 4.6	• Transforms creative ideas into readily-understood information for specific audiences • Develops material about the advantages and limitations of different technologies, using clear language to convey information and requirements
Oral Communication	1.2, 2.3, 3.2, 3.3, 4.4, 4.5	• Elicits information using effective listening and open-questioning techniques • Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information
Numeracy	2.2, 2.4, 2.5, 3.1, 4.1, 4.2, 4.4	• Develops mathematical representations of any three-dimensional surface of objects using whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other 3-D modelling elements • Interprets numerical data in order to decipher technical charts, diagrams, and other specifications
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Implements actions as per the plan, making slight adjustments if necessary, and addressing some unexpected issues • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of factors into account • Uses feedback and evaluation of results to inform decisions about future improvement • Utilises a broad range of features within digital applications for specific purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM514 Design and create models for a 3-D and digital effects environment	ICAGAM514A Design and create models for a 3-D and digital effects environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM514 Design and create models for a 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and build a portfolio of reference material
- prepare a topology plan for a 3-D model design using:
  - appropriate industry terminology
  - appropriate geometry surfaces
  - concept development software
  - feedback from others to refine the plan
- use software to construct an advanced 3-D model according to plan, and use feedback from others to refine the model.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline methods of sourcing reference material

summarise the key aspects of a modelling plan

- discuss geometry surfaces, including:
  - NURBS
  - Sub-D
  - Polygon
  - T-splines
- explain the digital model development process
- explain the technology requirements and human resources required to create 3-D models, and their respective skills
- explain box, edge-loop and patch modelling
- summarise the capabilities and constraints of 3-D modelling packages
- outline why it is important to schedule each production component
- explain features of topology plans
- discuss the uses of storyboards and scripts.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM515 Design and create advanced particles, fluids and bodies for 3-D digital effects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and create, advanced simulated effects in a 3-D and digital effects environment.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse approaches to design requirements	1.1 Analyse the design requirements for particle systems, fluids and bodies outlined in the brief and organisational documents 1.2 Identify where the advanced simulated effects will fit into the production pipeline 1.3 Identify the factors that may influence the design approach to creating advanced simulated effects
2. Demonstrate the application of advanced simulated effects	2.1 Review the media and techniques that may inspire ideas for simulated effects 2.2 Respond to the brief and documents, and provide solutions to the creation of advanced simulated effects for 3-D environments 2.3 Present design ideas and design considerations, with justification of the choice of advanced simulated effects to the relevant personnel
3. Plan approach to simulated effects	3.1 Adapt and finalise the design according to feedback from the relevant personnel 3.2 Identify skills and processes required for creating advanced simulated effects systems 3.3 Source and gather reference materials, and maintain a portfolio of these references 3.4 Plan a time line to create the advanced simulated effects
4. Produce particles, fluids and bodies for review	4.1 Use programming languages to create code to assist, or produce, the advanced simulated effects 4.2 Using toolsets, create prototype of advanced simulated effects based on finalised design 4.3 Implement physics and forces to the advanced simulated effects, to produce the desired outcome 4.4 Conduct testing 4.5 Review the results, and present the created effects, to the relevant personnel for feedback and discussion about the implementation of the effects, in accordance to the requirements of the design
5. Finalise advanced	5.1 Adapt the advanced simulated effects and design if necessary,

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ELEMENT	PERFORMANCE CRITERIA
simulated effects	according to feedback 5.2 Refine the advanced simulated effects 5.3 Present the finalised advanced simulation effects in the requested form, including the pre-production portfolio, demonstrating project research and development for evaluation, and review, by the relevant personnel

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2	• Interprets, analyses and comprehends briefs, documents, and conceptual information, to inform job requirements
Writing	2.3, 3.1, 4.1, 4.5, 5.1, 5.3	• Develops readily understood design and instructional documentation • Transforms creative ideas into documents for specific audiences
Oral Communication	2.3, 3.1, 4.5, 5.1, 5.3	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open-questioning techniques • Provides practical advice, support and feedback to colleagues and management
Numeracy	2.2, 3.1, 4.3	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other elements of radical 3-D effects
Get the work done	All	• Takes responsibility for own workload, negotiating some key aspects with others • Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Implements actions as per plan, making slight adjustments if necessary, and addressing some unexpected issues • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options, against the agreed criteria • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues, and using lateral thinking processes to generate possible solutions • Develops and shapes several options before making a final choice, using a combination of lateral and analytical thinking to tailor and strengthen ideas to suit needs, resources and constraints • Recognises the value of continuous improvement

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		within own work context • Utilises a broad range of features within applications to improve personal productivity, optimising software functions for specific purposes • Manages and maintains files securely, in a variety of storage media and formats, and is beginning to actively establish, maintain and monitor electronic paper trails

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTGAM515 Design and create advanced particles, fluids and bodies for 3-D digital effects	ICAGAM515A Design and create advanced particles, fluids and bodies for 3-D digital effects	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM515 Design and create advanced particles, fluids and bodies for 3-D digital effects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse design requirements and develop design documents
- develop advanced simulation effects according to requirements
- use appropriate effects, such as particles, fluids and rigid or soft bodies
- use programming languages to assist the creation of advanced simulation effects
- adapt design according to feedback
- produce a refined and finalised deliverable
- maintain a portfolio of reference materials.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the programming techniques required for creation of 3-D digital effects
- discuss computer game development, including specific terminology
- summarise the current game-play hardware and software products
- summarise the technology requirements and human resources required in the process of creating digital effects and each team member's respective skills
- explain risk and critical path management
- provide a detailed summary of the technical constraints that hardware imposes on:
  - software development
  - graphics requirements
  - code development
  - creative visual design
- explain the techniques for applying concept development skills
- explain the techniques for applying concept visualisation skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM516 Animate a 3-D character for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply animation principles to develop an animated character, and export the character model into a game.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine a 3-D character model for animation requirements	1.1 Study the production documentation animation requirements for 3-D character 1.2 Determine the target environments for a 3-D digital character animation 1.3 Establish the required level of detail for a 3-D character model animation 1.4 Determine work-flow sequences, to ensure that production schedule deadlines are met 1.5 Select the software tools that best suit the production pipeline and the target game engine, and platform, for the final export of a 3-D digital character modelling, and animations
2. Create the required animations, using a variety of animated tools	2.1 Determine the most efficient animation methodology 2.2 Animate first pass, applying animation principles and experimenting with techniques to produce the required movements 2.3 Submit first pass for approval to the relevant personnel 2.4 Make adjustments, as required, and refine animation in passes until storyboard requirements are achieved 2.5 Animate facial features with lip-syncing to match the audio and design requirements of the approved storyboard 2.6 Create primary animations, as required
3. Finalise the animations	3.1 Submit character animations for the final check to relevant personnel 3.2 Finalise projects according to the production procedure
4. Export the animations	4.1 Export the animation and 3-D character model to the required game engine 4.2 Test the character animations in the game engine 4.3 Submit the final character animations to the relevant personnel

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.5, 3.2	• Interprets, analyses and comprehends workplace documentation and images, to aid implementation of job requirements
Writing	1.3, 1.4	• Creates documents for specific personnel, incorporating complex design information according to industry standards and required formats
Oral Communication	1.3, 1.4, 4.3	• Elicits information using effective listening and open questioning techniques • Provides practical advice, support and feedback to colleagues and management, converting highly technical language and terminology to plain English
Numeracy	2.2, 2.4, 2.5, 2.6	• Applies numerical skills to develop applications using whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other 3-D elements
Interact with others	2.3, 3.1, 4.3	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers, in a range of work contexts • Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships • Elicits feedback and provides feedback to others to improve self or workgroup behaviours
Get the Work Done	1.2-1.5, 2.1-2.6, 3.2, 4.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Monitors the progress of plans and schedules, and reviews, and changes these in order to meet new demands and priorities • Makes critical decisions quickly and intuitively in complex situations, taking into consideration a range of variables, including the outcomes of previous decisions • Applies systematic and analytical decision-making processes for complex and non-routine situations • Investigates new and innovative ideas as a means to continuously improve work practices and processes

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		• Uses, and investigates, new digital technologies and applications to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM516 Animate a 3-D character for digital games	ICAGAM516A Animate a 3-D character for digital games	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM516 Animate a 3-D character for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select the correct tools to work with the target game engine and platform
- apply animation principles
- develop an animated character model
- export the animated character model to the game engine
- test character animations in the game engine.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain 3-D animation principles, including the relevance of anatomy and physical movement
- summarise the capabilities and constraints of game engines
- summarise attributes of current game-play hardware and software products
- explain the function of a graph curve editor
- discuss risk and critical path management
- explain shading, texturing, weight and anticipation
- discuss transfer methodology, including rotoscope, hand key and motion capture
- provide a detailed summary of techniques for applying concept development skills
- summarise techniques for applying concept visualisation skills
- summarise techniques for using storyboard and script production
- discuss the technology requirements and human resources required in the process of creating games, and the team's skills
- outline the importance of communication with a client when working on projects
- outline budgeting and scheduling considerations for game design
- explain the importance of time management in the development of a project.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM517 Produce a digital animation sequence

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce a digital animation sequence for the 3-D and digital effects environment, involving the completion of a digital editing project.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop or source story or concept	1.1 Research ideas for the animation sequence 1.2 Produce treatment of an animation sequence
2. Develop plan and determine components required for the animation sequence	2.1 Produce and work according to the production plan 2.2 Develop a storyboard detailing the 3-D animation 2.3 Create concept drawings for 3-D models 2.4 Show evidence of the reference material used for storyboard and concept drawings
3. Produce the animation sequence using 3-D software	3.1 Use the production plan to create the animation 3.2 Select appropriate frames per second to use for the animation 3.3 Use references to create assets 3.4 Create a 3-D animation project using 3-D modelling and animation software 3.5 Animate components of the 3-D environment to reflect the planned animation sequence 3.6 Using 3-D modelling and animation software, produce high-end lighting techniques
4. Render and finalise the 3-D animation sequence	4.1 Select the appropriate resolution and aspect ratio 4.2 Employ 3-D modelling software to render the animated sequence 4.3 Review the rendered frames against the initial storyboard concept

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1, 3.3, 4.3	• Interprets, analyses and comprehends workplace documentation and images to inform job requirements
Writing	1.2, 2.2, 2.3	• Creates documents incorporating complex design information and ideas according to industry standards and required formats
Numeracy	3.2, 3.3, 3.5, 3.6, 4.1	• Applies numerical skills to develop sequences using whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other 3-D elements
Get the work done	All	• Takes responsibility for planning, organising and implementing tasks required to achieve outcomes • Implements actions as per plan, making slight adjustments, if necessary, and addressing some unexpected issues • Makes a range of critical and non-critical decisions in relatively complex situations, analysing information and taking a range of factors into account • Understands and applies some of the basic principles of analytical and lateral thinking • Utilises a broad range of features within 3-D software applications to improve personal productivity, optimising software functions for specific purposes • Manages and maintains files securely, in a variety of storage media and formats

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM517 Produce a digital animation sequence	ICAGAM517A Produce a digital animation sequence	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM517 Produce a digital animation sequence

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- show the reference material used for concepts and storyboards
- develop storyboards and concept drawings for 3-D animation and models according to plans
- apply a variety of strategies to create an animation sequence using a 3-D environment
- develop a finalised frame of the animation in an appropriate resolution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise digital editing processes and techniques
- summarise rendering processes and techniques
- outline the capabilities of digital editing and rendering software
- discuss the technology requirements and human resources required to create games, including team member's skills
- discuss the technical constraints that hardware imposes on:
  - graphics requirements
  - code development
  - creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM518 Animate physical attributes of models and elements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to animate the appropriate physical attributes of models and elements.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators, and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Collect and use reference material	1.1 Create the storyboard sequence of required animation 1.2 Determine the animation attribute sequence of objects, as per the storyboard 1.3 Select the 3-D modelling and animation software tools that best suit the type of production, and target platform, for which 3-D digital animations are being created 1.4 Research and gather the reference material to inform the animation
2. Prepare 3-D digital models using a variety of manipulating techniques	2.1 Determine the most efficient animation methodology from the required models 2.2 Ensure that the models' topology allows the appropriate deformation of objects and their parts, as per the storyboard animation brief 2.3 Apply a variety of manipulation techniques 2.4 Progressively refine animation attributes and check the integrity of models and elements over time, until the storyboard requirements are met 2.5 Submit the pre-model animation to the relevant personnel to determine whether storyboard objectives have been met, then make final adjustments as required
3. Create the required animations using a variety of animated tools	3.1 Animate the object, applying animation principles and techniques to produce the required motions 3.2 Submit the animation for approval 3.3 Make adjustments as required and refine the animation in passes until the storyboard requirements are achieved
4. Use lighting to evaluate texture, quality and performance	4.1 Use nominal lighting to render the component for testing purposes 4.2 Test against the plan 4.3 Continue the manipulation process until the effect is achieved
5. Render 3-D digital model using appropriate render engine	5.1 Evaluate the final render, taking steps to satisfy any further client requirements 5.2 Prepare any required render passes

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Render the component 5.4 Present the edited material to the relevant personnel, as well as the brief and documents, including concept art, in an appropriate format for evaluation
6. Back up work	6.1 Make backup copies of files, and complete workplace documentation, according to chosen predetermined procedures

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.4, 2.4,	• Interprets and analyses reference sources
Writing	1.1, 5.4, 6.1	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience, when creating storyboard and workplace documentation
Numeracy	2.3, 2.5, 3.1, 3.3	• Uses mathematical and problem-solving strategies when applying manipulation techniques, animating objects and making adjustments
Interact with others	2.5, 3.2, 5.4	• Understands what to communicate, with whom and how, when submitting work for evaluation and approval
Get the work done	All	• Plans a range of routine and non-routine tasks, including collecting resources, determining storyboard sequences, and selecting software tools • Implements actions as per plans, making slight adjustments if necessary, and addressing some unexpected issues • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of factors into account • Utilises a broad range of features of software applications for specific purposes • Manages and maintains the files securely in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM518 Animate physical attributes of models and elements	ICAGAM518A Animate physical attributes of models and elements	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM518 Animate physical attributes of models and elements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and collate reference materials
- create a storyboard sequence and use the storyboard to prepare pre-model animation for approval
- use animation and rendering software to create animations, according to animation principles and storyboard requirements
- present a final 3-D digital model, together with supporting documentation, for approval
- store files according to procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the principles of 3-D animation, lighting and modelling
- describe how knowledge of anatomy and physical movement is relevant to animation
- describe the importance of client communication when working on projects
- explain the importance of budgeting and scheduling considerations during projects
- outline the techniques for creating a storyboard
- outline techniques for script production
- describe the application of current game-play hardware and software products
- provide a detailed explanation of the purpose of dope sheets
- describe the principles of the graph curve editor for smooth animation
- outline the physical attributes to create effects, including weight and anticipation
- explain the purpose of rendering
- explain shading and texturing techniques
- provide a detailed summary of transfer methodology, including rotoscoping hand key and motion capture.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM519 Manage technical art and rigging in 3-D animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, implement, and manage 3-D animation rigs for objects using structural controls, and construct hierarchies to formulate object geometry, and skeletal rigs to a defined project brief.

It applies to individuals with high-level mathematical, technical and communication skills working as concept artists, game designers, games programmers, animators, and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use reference or source materials to assess rig requirements	1.1 Use organisational procedures and production documentation to determine model rigging requirements 1.2 Maintain a portfolio of reference materials 1.3 Determine the range of software features available, when using various rigging technologies
2. Plan rig suitable for animation/movement	2.1 Analyse the inner workings of the object to select appropriate skeletal or structural systems 2.2 Analyse required bones or joints behaviours to select correct orientations 2.3 Examine object geometry topologies to select the correct bone and joint placement 2.4 Analyse critical object movement to select forward kinematics (FK) or Inverse Kinematics (IK) requirements, or a hybrid solution 2.5 Record the results for use at the rigging implementation phase
3. Implement character skeleton requirements	3.1 Use 3-D software to place the bones and joints, according to rigging plan 3.2 Use 3-D software to orientate the bones and joints, according to rigging plan 3.3 Use 3-D software to construct FK or IK requirements in adherence to the rigging plan 3.4 Use 3-D software to construct hierarchies and pivotal sets 3.5 Trial and refine rotations and movement attributes
4. Employ character movement and implement character attributes and control handles	4.1 Use 3-D software to construct specific driven attributes for manipulation purposes 4.2 Use 3-D software to create, and place, control handles with the appropriate attributes 4.3 Use 3-D software to link control handles to improve the animation procedures 4.4 Trial and refine the controls, and attributes 4.5 Negotiate modifications, where appropriate 4.6 Use 3-D software toolsets to skin/bind object geometry, to created skeletal systems or mechanical structures

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ELEMENT	PERFORMANCE CRITERIA
5. Test and refine rig integrity	5.1 Use 3-D software to test and refine, object rig interaction 5.2 Use 3-D software toolsets to test and refine, geometry skeleton systems or mechanical structure interaction 5.3 Negotiate modifications, where appropriate
6. Produce animated sequences of rigged object	6.1 Create 3-D animations of rigged models using animation and rigged modelling techniques, to suit design specifications 6.2 Render the completed animated sequences 6.3 Save and store the animated sequences, using appropriate output file formats, standard naming conventions, and version-control protocols 6.4 Present the 3-D animated sequences of rigged models to the relevant personnel for evaluation by agreed deadlines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1, 3.2, 3.3, 6.1, 6.3	• Interprets, analyses and comprehends briefs, documents and conceptual information to inform job requirements
Writing	2.5, 4.5, 5.3, 6.3	• Develops readily-understood conceptual and instructional documentation, using programming language • Transforms creative ideas for specific audiences, using clear and detailed language
Oral Communication	1.3, 4.5, 5.3	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques
Numeracy	4.6, 5.1, 5.2	• Undertakes geometric calculations to deduce measurements, relationships between points, lines, angles and figures in space by using assumed properties of space
Interact with others	4.5, 5.3, 6.4	• Recognises and applies the protocols governing what to communicate, with whom and how, when presenting work for evaluation, and negotiating modifications
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Implements actions as per the plan, making slight adjustments if necessary, and addressing some unexpected issues • Makes a range of critical and non- critical decisions in relatively complex situations, taking a range of factors into account when planning, testing and refining rigs • Utilises a broad range of features within applications to improve personal productivity, optimising software functions for specific purposes • Manages and maintains files securely in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM519 Manage technical art and rigging in 3-D animation	ICAGAM519A Manage technical art and rigging in 3-D animation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM519 Manage technical art and rigging in 3-D animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, implement and manage rigs for objects according to production documentation and organisational procedures
- use and refine skeleton/structural and animation controls for best performance
- construct hierarchies to formulate specific controls
- combine and refine object geometry to skeletal/structural rigs
- create 3-D digital animated sequences of a rigged model
- meet production deadlines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise basic 3-D digital animation techniques
- explain the features of a range of delivery platforms
- describe the skills required for geometry topology analysis
- explain how to identify appropriate physical attributes to animate
- explain rigged 3-D modelling techniques
- discuss the theory of anatomy and structural systems and how they relate to 3-D animation techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM520 Create and combine 3-D digital games and components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create compound models using recognised industry software suitable to the animation production process, according to a defined set of parameters.

It applies to individuals with high-level technical and analytical skills working as modellers or artists, in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine model creation requirements	1.1 Analyse and follow the design requirements, production documentation and organisational guidelines 1.2 Select the 3-D modelling software tools that best suit the type of production for which 3-D digital models are being created
2. Create 3-D digital models using a variety of modelling techniques	2.1 Determine the most efficient modelling methodology 2.2 Apply a variety of modelling techniques 2.3 Create the 3-D digital models 2.4 Progressively refine and check the integrity of the models
3. Combine 3-D models to create a scene	3.1 Combine the 3-D models to create a scene, based on the design requirements 3.2 Submit the models to the relevant personnel for comment, to determine whether the production requirements have been met, and make final adjustments, if required
4. Render 3-D digital models using appropriate render engine	4.1 Test the rendering scene and adjust the settings 4.2 Render the final 3-D scene 4.3 Submit the final model renders to the relevant personnel
5. Back up work	5.1 Make backup copies of the files 5.2 Complete the workplace documentation, according to predetermined procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1, 5.2	• Interprets, analyses and comprehends briefs, documents and conceptual information • Analyses texts and images to inform the implementation of specifications
Writing	5.2	• Develops readily understood administrative documentation, using detailed and workplace-specific language
Oral Communication	3.2, 4.3	• Speaks clearly and concisely, converting technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques • Provides practical advice, support and feedback, to colleagues and management
Numeracy	2.4, 3.2, 4.1	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other elements of 3-D animation
Get the work done	All	• Takes responsibility for planning and organising tasks required to efficiently meet required outcomes • Implements actions as per the plan, making slight adjustments if necessary, and addressing some unexpected issues • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of factors into account • Understands and explicitly applies, some basic principles of analytical and lateral thinking when creating a concept • Utilises a broad range of features within 3-D software applications for specific purposes • Manages and maintains files in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM520 Create and combine 3-D digital games and components	ICAGAM520A Create and combine 3-D digital games and components	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM520 Create and combine 3-D digital games and components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create 3-D models according to design, production and organisational requirements
- combine 3-D models to build a scene that meets design requirements
- produce, circulate and store the final render of the scene.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a basic summary of 3-D software interfaces
- summarise the capabilities and constraints of game engines
- outline current game-play hardware and software products
- discuss the process of computer game development
- discuss the application of the anatomy, and physical movement, to 3-D components
- describe the graph curve editor and its application to animation
- explain the physical attributes required to create effects, such as weight and anticipation
- summarise risk and critical path management
- discuss the importance of shading and texturing as a requirement of 3-D games components
- explain the techniques for applying concept-development skills
- explain the techniques for applying concept-visualisation skills
- explain transfer methodology including rotoscope, hand key and motion capture
- outline the technology requirements and human resources required in the process of creating a game, including team members' skills
- outline the budgeting and scheduling considerations for game design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM521 Create interactive 3-D environments for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to coordinate the design and technical elements of a smooth-running interactive 3-D environment.

It applies to individuals with excellent organisational skills and high-level technical expertise working as concept artists, game designers, games programmers, animators, and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Obtain the design documents for the 3-D environment	1.1 Conceptualise the design requirements, based on the project brief and other relevant documents 1.2 Identify the requirements for the design of the 3-D environment 1.3 Determine the design considerations, and generate the concept art for the final environment design 1.4 Ensure that any missing requirements are considered and included in the design
2. Identify software tools that can be used to create 3-D environments	2.1 Identify the texturing tools, including painting, shading and texturing software 2.2 Identify the audio tools 2.3 Identify the 3-D modelling and animation software to be used
3. Document and justify the design decisions	3.1 Clearly document the design decisions 3.2 Explain and justify the design decisions 3.3 Make changes, where necessary
4. Create the 3-D environment	4.1 Implement basic geometry, flow and layout 4.2 Separate each section of the environment into key parts and choose a focal point for the environment 4.3 Incorporate detail into the focal point of the level 4.4 Use the focal points to set a reference for the rest of the environment 4.5 Integrate the geometry, texturing, and place the models 4.6 Carry out a detailed pass of the entire environment 4.7 Set up the exterior lighting and then the interior lighting 4.8 Incorporate any sound and particle effects, and perform optimisation, if required 4.9 Perform a final pass, finalising any elements
5. Present the finished 3-D environment to relevant personnel	5.1 Present the finished 3-D environment to the relevant personnel 5.2 Report how the design decisions have met the 3-D environment design requirements

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Justify why certain design decisions were made 5.4 Accept peer feedback and incorporate in the final design

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets analyses and comprehends briefs, documents and conceptual information to inform job requirements
Writing	1.1, 1.3, 1.4, 3.1, 3.2, 3.3, 5.2, 5.3	• Develops readily-understood conceptual documentation using technically appropriate language • Transforms creative ideas for specific audiences using clear and detailed language to justify choices that have been made
Oral Communication	1.2, 1.3, 3.2, 5.1, 5.2, 5.3, 5.4	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques
Numeracy	4.1, 4.5	• Undertakes geometric calculations to deduce measurements, relationships between points, lines, angles and figures in space by using assumed properties of space
Interact with others	5.1, 5.2, 5.3	• Recognises and applies the protocols governing what to communicate, with whom and how when presenting work to others for feedback
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9	• Takes responsibility for planning, organising and implementing tasks required to achieve outcomes • Implements actions as per the plan, making slight adjustments if necessary, and addressing some unexpected issues • Makes a range of critical and non- critical decisions in relatively complex situations, taking a range of factors into account • Understands and applies some basic principles of analytical and lateral thinking • Utilises a broad range of features within 3-D software applications for specific purposes • Manages and maintains files in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM521 Create interactive 3-D environments for digital games	ICAGAM521A Create interactive 3-D environments for digital games	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM521 Create interactive 3-D environments for digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret design requirements, produce concept art accompanied by documentation that justifies and explains design decisions
- implement design requirements into a working 3-D environment
- create working interactions between the user and the environment
- deliver a finished 3-D environment and report on design decisions to others.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the budgeting and scheduling considerations for game design
- discuss the process used to develop computer games
- outline the technology requirements and human resources required to create games, including the team's respective skills
- explain current game-play hardware and software products, including any constraints that product impose on graphics and code development and creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM522 Complete digital editing for the 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to edit a sequence in a 3-D environment, and finalise the edit in an appropriate video format.

It applies to individuals with high-level technical and communication skills working as concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research the digital editing techniques and software	1.1 Research industry-standard digital editing techniques 1.2 Determine the suitable techniques to apply in various scenarios 1.3 Research the available digital editing software used in the industry 1.4 Identify the technical limitations, and constraints, of rendering and editing processes
2. Obtain or create the 3-D animation sequence	2.1 Obtain or create a 3-D animation sequence in frames 2.2 Obtain or create a storyboard for the sequence 2.3 Use a suitable naming scheme for the rendered frames, and organise the files into a folder structure
3. Apply digital editing techniques	3.1 Edit the rendered frames, and any additional graphics, into the sequence outlined in the storyboard 3.2 Apply program functions to create and insert graphics, transitions and special effects into the animation 3.3 Implement sounds and music at the appropriate frame locations 3.4 Ensure that efficient file management is maintained during the editing process
4. Finalise a digitally edited production	4.1 Use editing software to resolve any sound or transition errors 4.2 Evaluate the final edit 4.3 Present the finalised edit to the relevant personnel, in an appropriate video format 4.4 Receive and incorporate the feedback

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1	• Interprets analyses and comprehends briefs, documents and conceptual information, to inform job requirements
Writing	2.2, 2.3, 4.4	• Develops readily-understood games, technical design and instructional documentation, using programming or industry-specific language • Transforms creative ideas for specific audiences, using clear and detailed language
Oral Communication	1.2, 4.3, 4.4	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques • Provides practical advice, support, and feedback to colleagues and management
Numeracy	2.1, 3.1	• Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other elements of a 3-D environment
Interact with others	4.3, 4.4	• Recognises and applies the protocols governing what to communicate, with whom and how, when presenting work to others for feedback
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4	• Takes responsibility for planning, organising and implementing tasks required to achieve required outcomes • Implements actions as per the plan, making slight adjustments if necessary and addressing some unexpected issues • Makes a range of critical and non-critical decisions in relatively complex situations • Uses analytical processes to decide on a course of action, establishing criteria for evaluating options, and taking a range of factors into account • Utilises a broad range of features within editing software applications for specific purposes • Manages and maintains files in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM522 Complete digital editing for the 3-D and digital effects environment	ICAGAM522A Complete digital editing for the 3-D and digital effects environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM522 Complete digital editing for the 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use research to identify and select digital editing techniques and software
- edit a 3-D sequence by inserting graphics, special effects, sounds and music according to a storyboard, and store all files efficiently
- use editing software, and feedback from others, to develop a final version in an appropriate video format.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain digital editing and rendering processes and techniques
- discuss the capabilities, and constraints, of digital editing and rendering software
- summarise the technical constraints that hardware imposes on:
  - software development
  - graphics requirements
  - code development
  - creative visual design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM523 Collaborate in the design of 3-D game levels and environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, and implement, the design of an interactive 3-D game in a team environment.

It applies to individuals with high-level technical and communication skills working as concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and plan the design process	1.1 Select a project planning methodology 1.2 Identify the design practices and design considerations in collaboration with other team members 1.3 Record the stages of the design process, using the project brief and documents 1.4 Identify the team roles that relate to level creation and design 1.5 Plan and implement a design process using time-management principles
2. Conceptualise a 3-D environment design in collaboration with team	2.1 Identify the key level specifications, and purpose, for the 3-D environment 2.2 Gather and analyse reference materials in collaboration, to help with visualisation of 3-D environment, including environment profiles, game genre, game design and game-play elements 2.3 Catalogue the required objects of the level environment 2.4 Identify the appropriate 3-D modelling and animation software, and painting, shading and texturing software that can be used to create the 3-D environment 2.5 Document the design decisions that are made before, and during, the design conceptualisation 2.6 Produce the concept art of the designed environment
3. Present the conceptualised environment to peers	3.1 Present the conceptualised environment to peers and receive feedback 3.2 Report on how the design decisions have met the requirements for game-play elements 3.3 Justify why certain design decisions were made 3.4 Receive and consider peer feedback
4. Refine the design	4.1 Implement quality assurance principles 4.2 Incorporate user feedback to modify the design 4.3 Finalise the design decision documents in readiness for creating the 3-D environment

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 3.4	• Interprets analyses and comprehends briefs, instructions, and conceptual information to inform job requirements
Writing	1.2, 1.3, 2.3, 2.5, 2.6, 3.1, 3.2, 3.3, 4.2, 4.3	• Develops readily-understood technical, design and instructional documentation • Documents the decision-making process for specific audiences, using clear and detailed language
Oral Communication	1.2, 3.1, 3.2, 3.3, 3.4	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques • Provides information, support and feedback to colleagues and management
Interact with others	1.2, 1.4, 2.2, 3.1	• Recognises and applies the protocols governing what to communicate, with whom and how • Cooperates and collaborates with others to achieve shared outcomes
Get the work done	1.1-1.5, 2.1-2.6, 4.1-4.3	• Takes responsibility for planning and organising tasks required to achieve required outcomes, including coordinating tasks with others • Makes a range of critical and non-critical decisions in relatively complex situations, using analytical processes to evaluate and choose appropriate options • Understands and explicitly applies some basic principles of analytical and lateral thinking • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals for modelling and animation • Manages and maintains files in a variety of storage media and formats

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM523 Collaborate in the design of 3-D game levels and environments	ICAGAM523A Collaborate in the design of 3-D game levels and environments	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM523 Collaborate in the design of 3-D game levels and environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- collaborate with others to plan and implement the design process for creating an interactive 3-D environment
- produce and present draft design documents for the production of an interactive 3-D environment, and gather feedback
- review and modify the designs to create a finalised design for a 3-D environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the budgeting and scheduling considerations for game design
- discuss the capabilities and constraints of game engines
- discuss the process used for computer game development
- outline current game-play hardware and software products, together with any technical constraints that products impose on graphics and code development, and creative visual design
- explain the technology and human resources required in the process of creating a game, including the team's respective skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM524 Integrate multiple data sources into interactive 3-D environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to integrate multiple data sources into interactive 3-D environments.

It applies to individuals with high-level technical and communication skills and may be applicable to concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Catalogue elements to integrate into the interactive 3-D environment	1.1 Research and identify data sources that can be integrated into interactive 3-D environments 1.2 Identify data sources that will be integrated to suit the environment, game design, game genre, game mechanics, game-play elements, and level specifications 1.3 Obtain or create data sources for the interactive 3-D environment
2. Identify tools that can be used to integrate assets	2.1 Identify tools and libraries for integration of identified elements into the 3-D environment 2.2 Review and document how the tools work
3. Integrate sources into the interactive 3-D environment	3.1 Create prototypes and integrate the elements into the interactive 3-D environment using the identified tools 3.2 Test integration of the elements 3.3 Ensure that the elements' integrity during the implementation is maintained
4. Present and evaluate completed 3-D environment with all data sources included	4.1 Present the interactive 3-D environment to the appropriate personnel 4.2 Review the feedback from the presentation 4.3 Evaluate and justify the implementation, using tools for the data sources

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets analyses and comprehends briefs, instructions and conceptual information to inform job requirements
Writing	2.2, 4.1, 4.2, 4.3	• Develops clear and detailed catalogue documentation • Documents the decision-making process for specific audiences using clear and detailed language
Oral Communication	4.1, 4.2, 4.3	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques • Provides practical advice, support and feedback to colleagues and management
Get the work done	1.1-1.3, 2.1, 2.2, 3.1-3.3, 4.1-4.3	• Plans, organises and completes work according to defined requirements and schedules taking responsibility for decision, and sequencing tasks to achieve efficient outcomes • Actively sources, analyses and evaluates data sources with the potential to meet 3D design requirements • Uses creativity and initiative in 3D design • Uses a systematic process to evaluate work and to implement improvements • Uses key features of specific digital systems and tools to effectively complete design tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM524 Integrate multiple data sources into interactive 3-D environments	ICAGAM524A Integrate multiple data sources into interactive 3-D environments	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM524 Integrate multiple data sources into interactive 3-D environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and obtain data sources, tools and libraries needed to integrate elements into an interactive 3-D environment
- create and test prototypes that integrate multiple data sources into a working interactive 3-D environment
- deliver a 3-D environment with working interactions that includes all data sources, with documented reasons for its implementation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the range of data sources for the 3-D environment
- discuss how game design, genre and mechanics, game-play elements and level specifications affect the choice of data source
- summarise current game-play hardware and software products used for interactive 3-D environments, including any technical constraints imposed on design and development
- describe the technology requirements and human resources required in the process of creating a game, including team members' respective skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM525 Apply digital texturing for the 3-D environment in digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research, select techniques, and apply industry standard graphic software tools, to digital texturing for the 3-D environment in digital games.

It applies to individuals with high-level technical, interpretive and communication skills and may be applicable to concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research common industry practices for texturing a 3-D environment	1.1 Research, identify and describe the methods of texture creation and texture mapping 1.2 Choose a suitable graphics software to create textures 1.3 Document the design considerations for texturing a 3-D environment
2. Create a basic 3-D environment	2.1 Use 3-D modelling and animation software 2.2 Create simple 3-D objects 2.3 Place the objects in a 3-D environment 2.4 Apply inbuilt lighting effects to the 3-D environment
3. Create multiple textures to apply to the 3-D environment	3.1 Use graphics software 3.2 Apply industry-standard methods to create the textures 3.3 Create textures to establish the look, and the feel, of the 3-D environment
4. Apply multiple texture effects to a 3-D environment	4.1 Load the textures into the 3-D animation and modelling software 4.2 Apply the textures to colour the 3-D objects and environment 4.3 Use texture-mapping techniques to create multiple texture effects for a single 3-D object 4.4 Employ 3-D animation and modelling software to render an image of the 3-D environment

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Researches common industry practices to interpret technical design terminology • Interprets and comprehends a large range of diagrams, icons, symbols, text, numbers and letters, necessary to use complex design software
Writing	1.1, 1.3	• Uses correct spelling and grammar, plain English, specific terminology and appropriate document layout when documenting methodologies and design considerations
Numeracy	2.1, 2.2, 2.3	• Uses whole numbers, decimals and percentages relevant to measurement, resolution aspect ratio, pixel ratio, scale, coordinates, colour, shading, and other attributes/variables in the application of digital effects
Get the work done	1.1-1.3, 2.1-2.4, 3.1-3.3, 4.1-4.4	• Plans, organises and completes tasks according to defined requirements and schedules • Makes decisions directly related to completion of required tasks • Uses creativity and initiative to visualise concepts • Actively sources, analyses and evaluates methodologies and software with the potential to meet 3-D texturing requirements • Uses key features of specific digital systems and software to complete design and creation tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM525 Apply digital texturing for the 3-D environment in digital games	ICAGAM525A Apply digital texturing for the 3-D environment in digital games	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM525 Apply digital texturing for the 3-D environment in digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research, select and document suitable techniques and software to create texturing for a 3-D environment
- use modelling and animation software to create 3-D objects in a 3-D environment
- use graphics software to create multiple textures appropriate for a 3-D environment
- produce a final rendered image of a 3-D environment that incorporates multiple texture effects for a single 3-D object.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the technology and human resources required in the process of creating textures for the 3-D environment
- discuss the capabilities and constraints of graphics software for texturing
- provide a detailed summary of the methods of texture creation and texture mapping
- explain the design considerations for texturing including resource limitations and constraints, and target markets.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTGAM526 Create complex 3-D characters for games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, and implement, a design for complex 3-D characters for games.

It applies to individuals with high-level technical, interpretive and communication skills and may be applicable to concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clarify work requirements	1.1 Identify the design requirements based on the project brief and documents 1.2 Using the design requirements, conceptualise the appropriate characters for the game environments, design, level specifications and genre 1.3 Gather and analyse the reference materials to help with the design, and visualisation, of 3-D character models 1.4 Ensure that any missing requirements are considered and included in the design
2. Conceptualise 3-D character design	2.1 Document the design decisions that are made before, and during, the design conceptualisation 2.2 Outline the key attributes of the character 2.3 Examine the design considerations and generate the concept art for the 3-D characters
3. Identify software tools that can be used to create 3-D characters	3.1 Identify texturing tools, including painting, shading and texturing software and 3-D modelling tools
4. Create complex 3-D characters	4.1 Create base 3-D character models 4.2 Refine and polish the character models to a near finalised state 4.3 Create and map, the textures to apply to the 3-D character models 4.4 Refine the textures and apply shaders 4.5 Check the integrity and modify the 3-D characters until they meet the design requirements 4.6 Present the 3-D model to the relevant personnel
5. Present the finished 3-D characters to relevant personnel	5.1 Present the finished 3-D characters to the relevant personnel 5.2 Report on how the design decisions have met the 3-D character's design requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 4.5	• Interprets analyses and comprehends briefs, instructions and conceptual information, to inform the design of environment specifications • Interprets and comprehends a large range of diagrams, icons, symbols, text, numbers and letters necessary to use complex design software
Writing	1.4, 2.1, 2.2	• Communicates software and graphics requirements and code development to others, using correct spelling and grammar, plain English, and industry terminology
Oral Communication	2.2, 2.3, 4.6, 5.1, 5.2	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and open questioning techniques • Provides practical advice, support and feedback to colleagues and management
Numeracy	4.1, 4.2, 4.3, 4.4, 4.5	• Uses whole numbers, decimals and percentages relevant to measurement, resolution aspect ratio, pixel ratio, scale, coordinates, colour, shading, and other attributes/variables in the application of digital effects
Get the work done	1.1-1.4, 2.1-2.3, 3.1, 4.1-4.6, 5.1, 5.2	• Plans, organises and completes work according to project brief and schedules, sequencing tasks to achieve efficient outcomes • Actively sources and analyses reference materials to support 3-D character design • Uses creativity and initiative in 3D character design and creation • Uses systematic, analytical processes in routine and non-routine situations to identify potential quality issues or problems, evaluate options and choose solutions • Uses the key features of specific digital systems and software to complete design and creation tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM526 Create complex 3-D characters for games	ICAGAM526A Create complex 3-D characters for games	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM526 Create complex 3-D characters for games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and manage the design process for creating 3-D character models according to a design brief
- incorporate the design specifications and create complex 3-D character models
- produce and deliver documentation, showing evidence of concepts creation and design decisions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise budgeting and scheduling considerations for game design
- discuss the process used for computer game development
- summarise the current game-play hardware and software products, including any technical constraints imposed on design and development
- explain the technology and human resources required in the process of creating a game, and outline the team members' respective skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM527 Integrate database with online game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to integrate a database with an online game, where the relationship between the game server and the database server is also considered a client-server relationship on a local area network.

It applies to individuals with high-level technical and problem solving skills working as programmers, analyst programmers and game programmers responsible for the development of code to connect a computer game to a database.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Install application programming interfaces (APIs) suitable to the game's data source provider	1.1 Research the appropriate application programming interfaces (APIs) 1.2 Identify the specific APIs suitable for the game architecture and the data source provider 1.3 Install the nominated APIs on game development computers
2. Define and use a connection to the data source	2.1 Define the game data source connection parameters 2.2 Store the connection parameters in an external text-based configuration file 2.3 Open and close the connection to the game data source
3. Configure and use the connection pooling	3.1 Configure connection pooling in the database management system 3.2 Define the connection pool parameters for minimum connections, maximum connections, and idle connections 3.3 Minimise the use of database resources through the use of connection pooling 3.4 Test and verify the use of connection pooling
4. Pass embedded structured query language (SQL) to the database	4.1 Define the database connection property 4.2 Compose a structured query language (SQL) statement or command to be passed to the database 4.3 Test, debug and execute the SQL statement
5. Execute a stored procedure on a database	5.1 Call a stored procedure on the database, using a command callable statement 5.2 Define and pass the parameters to the stored procedure 5.3 Test, debug and execute the database stored procedure
6. Modify database data	6.1 Retrieve multi-row multi-column result sets from the database into the game application domain 6.2 Insert new records into the database 6.3 Update existing database records 6.4 Delete existing database records
7. Integrate data from the	7.1 Integrate data from a forward-only and read-only cursor into

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ELEMENT	PERFORMANCE CRITERIA
database with the game application domain	the game application domain 7.2 Incorporate the data from an updateable cursor into the game application domain
8. Test and debug database integration code	8.1 Test the database integration code 8.2 Document the test results 8.3 Determine the errors and exceptions, and document the solutions 8.4 Debug all errors and exceptions 8.5 Assess all data modifications in the database, and document any errors 8.6 Correct all causes to data modification errors

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Identifies and evaluates documents containing complex technical terminology to identify which APIs are best suited to the game application domain and the game architecture
Writing	2.1, 2.2, 3.2, 4.1, 4.2, 4.3, 5.3, 6.2, 6.3, 8.2, 8.3, 8.5	• Uses the appropriate programming code, syntax and conventions to update, test and de-bug the database integration code • Documents test results and technical solutions, using correct spelling and grammar, plain English, and industry terminology
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.4, 4.1-4.3, 5.1-5.3, 6.1-6.4, 7.1, 7.2, 8.1-8.6	• Plans, organises and completes work according to project brief and schedules, sequencing tasks to achieve efficient outcomes • Actively sources and analyses reference materials related to database integration • Uses creativity and initiative in database assessment and design • Uses systematic, analytical processes in complex, routine and non-routine situations, gathering information, evaluating options, and identifying solutions to coding problems • Uses key features, of specific digital systems and software effectively to complete defined tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM527 Integrate database with online game	ICAGAM527A Integrate database with online game	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM527 Integrate database with online game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine and install application programming interfaces (API) for games development
- define and add database functionality to an online game
- integrate, test and modify the database data provided by game-play input and document all errors and solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed explanation of relational database theory, including how:
  - to create and test stored procedures
  - to create 'embedded' structured query language (SQL) and to assign parameters in the code for filtering
  - tables are related, and how relationships between tables are implemented
  - SQL is used to retrieve data from multiple tables
  - inserts to tables in parent/child relationships can be implemented using artificial (auto-generated) primary key values
  - to implement cascading updates and deletes
- summarise the principles of game development
- explain the principles of integrated development environments, including:
  - data access APIs and associated classes, required for the integration of a database with an online game
  - online help and documentation required for research and debugging code
  - user authentication and authorisation management
- outline the methodologies and techniques required for effective and well-factored object-oriented program (OOP) code, including:
  - class implementation
  - control of logic flow
  - use of collections and lists
  - use of OOP concepts, such as inheritance, encapsulation and overloading
- describe the implications of web development on games integration.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- the game design specification and requirements documentation
- a game server
- a database server
- integrated development environment software and hardware
- browsers for browser-based games or game consoles for console-based games.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTGAM528 Create games for mobile devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to demonstrate innovative game development strategies, to create games for mobile devices.

It applies to individuals with high-level technical, creative and communication skills working as concept artists, games designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research and document mobile gaming device technologies	1.1 Research, identify and describe the current mobile devices suitable for games 1.2 Identity a suitable mobile device 1.3 Identify the technical limitations and constraints of the mobile gaming device 1.4 Research and identify the tools and technology for creating applications for the mobile device 1.5 Identify a suitable tool for the mobile gaming device 1.6 Research, identify, and describe market-successful mobile game devices
2. Plan the project	2.1 Create or obtain the project brief and documents 2.2 Identify the game production assets required to meet creative and production requirements, and the technical specifications 2.3 Define developer roles and skills 2.4 Create a schedule for production and testing 2.5 Determine the strategies for monitoring the production progress against the schedule
3. Create game assets	3.1 Create graphics assets 3.2 Create music and sound assets
4. Develop a game prototype	4.1 Develop a game prototype using a programming language 4.2 Create and check game-play elements, according to creative and technical requirements 4.3 Test and run game-play on mobile devices 4.4 Identify whether or not the game meets creative, production and technical requirements
5. Evaluate the game prototype	5.1 Demonstrate the initial prototype to relevant personnel 5.2 Evaluate against criteria, including achievement of a creative and user-friendly product 5.3 Discuss, and agree, on required changes to the prototype 5.4 Assist, if required, in tests and user trials

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ELEMENT	PERFORMANCE CRITERIA
	5.5 Evaluate the feedback from user trials 5.6 Confirm the endorsement from relevant personnel to develop the prototype into a complete product
6. Transform the prototype into a final proof-of-concept prototype	6.1 Make the necessary changes, as indicated by user trials 6.2 Integrate all the game elements, as required by specifications 6.3 Polish the game

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.2, 4.2, 4.4, 5.5, 6.2	• Interprets, analyses and comprehends briefs, instructions, and conceptual information to inform design specifications • Interprets and comprehends a large range of diagrams, icons, symbols, text, numbers, and letters necessary to use complex programming software
Writing	1.1, 1.6, 2.1, 2.3, 2.4, 2.5, 4.1, 4.2, 5.6	• Uses plain English and industry terminologies to develop plans and schedules • Develops an interactive product using complex programming language
Oral Communication	5.1, 5.3, 5.6	• Speaks clearly and concisely, converting highly technical language and terminology to plain English, when providing information • Elicits information using effective listening and questioning techniques
Interact with others	5.3, 5.6	• Collaborates with others as part of familiar routine activities to achieve requirements
Get the work done	1.1, 1.2, 2.1-2.6, 3.1	• Actively sources information, applications and tools with the potential to meet the development requirements • Plans work schedules and organises and completes tasks required to achieve outcomes • Uses creativity and initiative in game design • Uses systematic, analytical processes in routine and non-routine situations, conducting evaluations, gathering information and assessing potential solutions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM528 Create games for mobile devices	ICAGAM528A Create games for mobile devices	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM528 Create games for mobile devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document plans and schedules relevant to game development
- implement game development and production strategies
- apply strategies for trialling and testing game prototypes
- evaluate whether games meet design brief, creative and technical requirements
- produce and demonstrate an original working game on a mobile device.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe current successful mobile game devices
- summarise the current tools and technologies needed for creating applications on mobile devices products
- summarise the technical constraints that mobile devices place on design and development of games
- outline suitable programming languages for mobile devices
- provide a detailed summary of budgeting and scheduling considerations for game design
- explain the importance of risk assessment and critical path planning
- explain the human resources required in the process of creating a game for a mobile device, and outline the team members' respective skills.
- outline the techniques for concept visualisation and development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTGAM529 Analyse business opportunities in the digital games environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research the current digital games climate and analyse business opportunities.

It applies to individuals with high-level technical, creative and communication skills working as concept artists, games designers, games programmers, animators and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the Australian digital games industry and development companies	1.1 Identify both large and small organisations in the Australian digital games industry 1.2 Identify recent projects undertaken by small and large organisations in the Australian digital games industry 1.3 Identify the resources required for the production of a digital game in a small business environment 1.4 Determine the process of subcontracting various production elements to other small businesses
2. Determine the structure of a game-development team	2.1 Identify the roles of engineers, artists, game designers, producers and additional staff 2.2 Identify the skills required to occupy each role in a game development team 2.3 Determine the interaction and collaboration between these roles
3. Investigate the process of starting an independent game development business	3.1 Identify the major factors involved in starting a small business in the digital games industry 3.2 Identify the legal requirements, environmental impact and sustainability considerations, and financial management of operating a small business 3.3 Identify the legal protection of the small business operator and dissolution procedures for a small business
4. Evaluate the role of the Australian government and other organisations related to digital game production	4.1 Identify the role of the Australian government and other organisations affecting the digital games industry 4.2 Identify the influence of the Australian government in game production and marketing 4.3 Determine the effect of rating standards on digital game production and marketing
5. Review copyright and intellectual property laws	5.1 Determine copyright and intellectual property laws related to digital game development 5.2 Undertake a review of the current state of national and international copyright pertaining to digital game assets 5.3 Incorporate the conventions of copyright related to the

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ELEMENT	PERFORMANCE CRITERIA
	production of a digital game project

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 2.2, 3.1-3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3	• Interprets, analyses and comprehends information from a range of relatively complex sources, including legislation
Writing	1.1-1.3, 2.1, 2.2, 3.1-3.3, 4.1, 4.2, 5.2, 5.3	• Documents results of research, analysis and reviews to inform analysis of business opportunities and requirements
Numeracy	1.3	• Analyses the budgetary requirements for the creation of a digital game in a small business environment
Navigate the world of work	3.2, 3.3, 5.1, 5.2, 5.3	• Identifies, confirms and incorporates legislative requirements of business operations
Get the Work Done	1.4, 2.2, 2.3, 4.3, 5.1, 5.2	• Systematically plans tasks to gather required information to build understanding of the digital games environment • Makes critical decisions in complex situations, taking a range of variables into consideration • Investigates new and innovative ideas as a means to identify business opportunities

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM529 Analyse business opportunities in the digital games environment	ICAGAM529A Analyse business opportunities in the digital games environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTGAM529 Analyse business opportunities in the digital games environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research the key organisations and types of projects undertaken in the Australian digital games industry
- document the resources, roles and skills requirements of a games development team, and the interaction required between team members
- research and document the main factors to consider for starting up and operating a small business in the digital games industry, including legal, government, environmental and financial considerations.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain sources of information about the Australian digital games industry
- explain the process of subcontracting
- explain various methods that could be used to allow interaction and collaboration between different members of a development team
- explain how rating standards affect digital game production and marketing
- explain risk and critical-path management
- outline copyright and intellectual property laws as they pertain to the development of digital games.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- the internet for research purposes
- relevant legislation, including copyright and intellectual property legislation, and work health and safety legislation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTGAM530 Develop and implement physics in a 3-D digital game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to integrate a physics, and rendering, engine into a 3-D digital game.

It applies to individuals with high-level technical and mathematical skills working as game engine developers, gameplay programmers and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop a game world system	1.1 Develop code using a programming language and create instances of the rendering engine, the scene manager and physics engine's world objects 1.2 Constrain the frame rate to a desired frame rate
2. Develop components to support game world creation using physics	2.1 Create and implement the game physics system 2.2 Implement the game object primitives 2.3 Use or develop a physics debugger to show collision frames
3. Develop an understanding of constraint dynamics	3.1 Generate game objects or physics bodies constrained by joints 3.2 Build a ragdoll using the game physics system
4. Develop an understanding of physics interactivity	4.1 Use the game physics system to ray cast the scene 4.2 Implement a player-controlled model 4.3 Implement and develop game physics system models
5. Develop an interactive scene	5.1 Use primitives to build a scene 5.2 Use trigger volumes to fire off events 5.3 Capture the collision events with call-backs 5.4 Use a toggle for collision frames
6. Compile a report	6.1 Build class diagrams for all objects 6.2 Describe the techniques used to create interactivity 6.3 Describe the objects and when they were used 6.4 Document the libraries used

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.1, 2.1, 2.3, 6.1, 6.2, 6.3, 6.4	• Uses technical terminology to document reports • Uses the appropriate programming code, syntax and conventions to develop the game
Numeracy	1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.3, 5.1, 5.2, 5.3	• Uses complex physics to simulate the world by creating mathematical models which measure mass • Computes algorithms to regulate time and speed • Interprets matrix-related functions to determine rate and scale • Completes algorithmic geometry to determine the relationship between points, angles, lines, surfaces and solids
Get the work done	1.1, 1.2, 2.1-2.3, 3.1, 3.2, 4.1-4.3, 5.1-5.4, 6.1-6.4	• Plans, organises and completes work according to defined requirements and schedules • Uses a systematic process to evaluate work, implement improvements and solve problems • Uses creativity and initiative in the application of game physics • Uses the key features of, specific digital systems and tools, and operates them effectively to complete design tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM530 Develop and implement physics in a 3-D digital game	ICAGAM530A Develop and implement physics in a 3-D digital game	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTGAM530 Develop and implement physics in a 3-D digital game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and document an interactive game that implements game physics
- identify, evaluate, and use a physics library.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain basic programming techniques needed to develop game objects
- describe the integration issues of common physics concepts in games design
- summarise the current game-play hardware and software products, including any technical constraints they impose on design and development
- summarise the human resources required in the process of creating a game, and respective skills
- explain the techniques for applying concept development and visualisation skills.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- suitable development environment
- physics libraries
- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTGAM531 Complete compositing to create elements for the 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine design requirements, plan, create and store composite photographic and 3-D digital effects elements.

It applies to individuals with high-level information technology skills who may work as compositors, matte painters, concept artists, modellers, animators, game designers, directors and other personnel working in the film, television and game development industries.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm the compositing requirements	1.1 Undertake consultations with the client to develop the compositing brief 1.2 Plan and schedule the compositing work 1.3 Identify the appropriate software tools, equipment and media for compositing work 1.4 Consult with the relevant personnel in regard to the technical aspects of the proposed compositing 1.5 Confirm the compositing requirements with the client prior to work commencement
2. Prepare the elements for compositing	2.1 Select the resolution and aspect ratio for final composited output 2.2 Create the digitised elements through non-digital means 2.3 Identify and obtain the source plates or layers, images and other elements for compositing 2.4 Modify or repair elements that are problematic, or inconsistent, with the desired outcomes 2.5 Undertake the colour correction of plates and elements 2.6 Create additional elements, where required 2.7 Generate mattes
3. Composite images to achieve an integrated result	3.1 Track and stabilise the images to be composited 3.2 Match cameras, lighting and shadows, and add motion blur, as required, to finalise the composite 3.3 Integrate the plates, layers or elements in the correct sequence, using compositing software 3.4 Incorporate the grain, where required 3.5 Present the test composites to the client for approval
4. Render the composited images and save files	4.1 Optimise the composited images for rendering 4.2 Undertake the rendering process using efficient levels of resources 4.3 Store or archive rendered files in the specified output format 4.4 Review the completed render, to ensure quality and

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ELEMENT	PERFORMANCE CRITERIA
	compliance with system requirements and the client brief
5. Present the composite to the client for final approval	5.1 Present the final composited images for client approval 5.2 Make adjustments to composited images, where required, to meet client requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 4.4	• Interprets, analyses and comprehends brief, instructions, technical and conceptual documentation and images relevant to a 3-D and digital games environment
Writing	1.1, 1.2, 1.5	• Uses plain English and industry terminologies to create clearly formatted documentation to confirm brief during the consultative phase of the project
Oral Communication	1.1, 1.4, 1.5, 3.5, 5.1	• Speaks clearly and concisely, converting technical language into plain English when providing information • Elicits information using effective listening and open questioning techniques
Numeracy	2.1	• Determines the proportional relationship between the width, height and ratio of the final output
Interact with others	1.1, 1.4, 1.5, 3.5, 5.1	• Conducts successful negotiations, in a variety of contexts, with suppliers, colleagues or clients
Get the work done	1.2, 1.3, 2.1-2.7, 3.1-3.5, 4.1-4.4, 5.2	• Plans, organises and completes work according to defined brief and schedules • Uses creativity and initiative in compositing • Uses a systematic process to evaluate work, implement improvements and solve problems • Actively sources, analyses and evaluates applications, tools and media with the potential to meet compositing requirements • Uses key features of specific digital systems and tools to complete compositing tasks

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTGAM531 Complete compositing to create elements for the 3-D and digital effects environment	ICAGAM531A Complete compositing to create elements for the 3-D and digital effects environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTGAM531 Complete compositing to create elements for the 3-D and digital effects environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a compositing brief, and schedule compositing work taking into account client requirements, and technical aspects
- communicate with others to discuss requirements and technical aspects of the job
- complete the compositing tasks to the required level of quality, according to the brief
- refine the elements for consistency, best image quality and visual impact
- adhere to system requirements related to file size, format and storage.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed summary of 3-D modelling, animation and visual effects development
- explain the aspect ratios for image output
- provide a detailed summary of camera, lighting and shadow matching
- discuss the efficient sizes and the appropriate formats for composited files
- summarise the scheduling and sequencing of production and post-production tasks
- discuss the range of compositing software available
- explain rendering principles.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- computer hardware and software
- games engines
- file storage
- compositing and output documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTICT101 Operate a personal computer

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to operate a personal computer (PC) in a home or small office environment, including accessing files with application programs, sending and retrieving emails, using the internet, using peripheral devices and applying basic security procedures and power management settings.

It applies to individuals who require entry level information and communications technology (ICT) knowledge and literacy skills to perform a range of simple operation tasks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use the personal computer	1.1 Identify physical components and associated peripheral devices of the personal computer to become familiar with the available network 1.2 Check physical connectivity of devices to ensure correct operation and performance 1.3 Boot up and follow procedures to activate the computer
2. Manage computer configurations	2.1 Alter the computer settings to best suit the user 2.2 Configure power management settings to minimise power consumption as an environmentally sustainable measure 2.3 Identify operating system and the application programs loaded on the computer to determine computer capability 2.4 Conduct basic software installation and removal to improve computer capability 2.5 Navigate and manipulate desktop environment to create and customise desktop icons and access application programs
3. Access and use basic application programs	3.1 Open a folder with file documents containing basic office applications, make minor changes and save in a different folder 3.2 Send and retrieve a simple email message using the desktop icon to communicate with other parties 3.3 Access the internet using the web browser to view and conduct basic web information search 3.4 Use firewall and antivirus and malware scans to reduce security risks and threats in the system
4. Access and use basic peripheral devices	4.1 Access external storage devices to retrieve, copy, move and save information in different media and locations 4.2 Use printer settings on an installed printer to print a document 4.3 Access audio-visual (AV) devices to view and play a multimedia file
5. Shut down computer	5.1 Back up important documents and programs to minimise risk of data loss 5.2 Save any work to be retained and close open application

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ELEMENT	PERFORMANCE CRITERIA
	programs 5.3 Shut down computer and switch off any unused peripheral devices

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 2.1-2.5, 3.2, 3.3	• Recognises textual information to determine and complete technical functions
Writing	3.1- 3.3, 4.1	• Enters information using familiar text types in a format appropriate to environment
Get the work done	1.1-1.3, 2.1-2.5, 3.1-3.4, 4.1-4.3, 5.1-5.3	• Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing • Understands the purpose and specific functions of common digital tools used in work contexts • Implements basic security requirements related to own tasks • Recognises and responds to predictable routine problems related to role in the immediate work context

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT101 Operate a personal computer	ICAICT101A Operate a personal computer	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT101 Operate a personal computer

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use hardware and software
- navigate around the desktop, using features to perform tasks
- save results of work.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify basic parts of a computer and various hardware components
- explain commonly used software operation and application packages
- name basic security functions and computer functions
- list a range of peripheral devices that can be used with a personal computer
- describe common computer storage devices.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- appropriate learning and assessment support when required
- personal computer, including printer, mouse, keyboard and monitor
- use of basic software currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT102 Operate word-processing applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to operate word- processing applications and perform basic operations, including creating and formatting documents, creating tables and printing labels.

It applies to individuals in the workplace using fundamental knowledge of word-processing under direct supervision or with limited responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Apply workplace health and safety (WHS) practices	1.1 Use workplace ergonomic work practices and strategies 1.2 Organise work area to ensure an ergonomic work environment
2. Create documents	2.1 Open word-processing application, create document and add data according to information requirements 2.2 Use document templates as required 2.3 Use simple formatting tools when creating the document 2.4 Save document to directory
3. Customise basic settings to meet page layout conventions	3.1 Adjust page layout to meet information requirements 3.2 Open and view different toolbars 3.3 Change font format to suit document purpose 3.4 Change alignment and line spacing according to document information requirements 3.5 Modify margins to suit the document purpose 3.6 Open and switch between several documents
4. Format documents	4.1 Use formatting features and styles as required 4.2 Highlight and copy text from another area in the document or from another active document 4.3 Insert headers and footers to incorporate necessary data 4.4 Save document in another file format 4.5 Save and close document to a storage device
5. Create tables	5.1 Insert standard table into document 5.2 Change cells to meet information requirements 5.3 Insert and delete columns and rows as necessary 5.4 Use formatting tools according to style requirements
6. Add images	6.1 Insert appropriate images into document and customise as necessary 6.2 Position and resize images to meet document formatting needs

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ELEMENT	PERFORMANCE CRITERIA
7. Print documents	7.1 Preview document in print preview mode 7.2 Select basic print settings 7.3 Print document or part of document from printer

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 3.1, 3.4, 7.1	• Interprets specific information to determine and complete work required
Writing	2.1, 4.3	• Prepares simple correspondence that incorporates key information in a format and style relevant to requirements
Navigate the world of work	1.1	• Takes some personal responsibility for adherence to regulatory requirements
Get the work done	1.2, 2.1, 3.1-3.6, 4.1-4.5, 5.1-5.4, 6.1, 6.2, 7.2, 7.3	• Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing • Understands the purpose and specific functions of common digital tools used in work contexts • Recognises and responds to common operational problems when using word-processing applications

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT102 Operate word-processing applications	ICAICT102A Operate word-processing applications	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTICT102 Operate word-processing applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- follow organisational ergonomic work health and safety (WHS) requirements and practices
- create, open and retrieve documents using customised basic settings
- format documents by creating tables and adding text, objects and images
- save and prints documents.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe formatting styles and their effect on formatting, readability and appearance of documents
- identify organisational requirements for ergonomics, including work periods and breaks
- select organisational style guide to use
- outline purpose, use and function of word-processing software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer and printer
- word-processing software currently used in industry
- documents detailing organisational style guide or policy and work health and safety (WHS) requirements
- data suitable for use with word-processing packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT103 Use, communicate and search securely on the internet

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to connect to the internet, securely send and receive emails, search the internet using web browsers and interact securely and in a socially responsible manner with a range of different internet sites.

It applies to individuals who use business technology to perform a range of routine tasks in the workplace or home office with limited responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Connect to and access the internet	1.1 Connect to internet via existing internet connection and confirm functionality 1.2 Open internet browser and set home page of personal choice by setting internet options 1.3 Ensure internet browser software security 1.4 Adjust display of the internet browser to suit personal requirements 1.5 Modify toolbar to meet user and internet browser needs 1.6 Access a particular website, note privacy and other conditions of use, and retrieve data 1.7 Use socially responsible behaviour when sharing information on the internet 1.8 Enter uniform resource locator (URL) in address line of internet browser
2. Use email for communications	2.1 Open email application package, create new email message and add addressees 2.2 Compose text of an email message according to organisational guidelines, and spell check and edit text as required 2.3 Create and add an automatic signature for the user 2.4 Attach files to email message where required 2.5 Determine and set priority and send email message 2.6 Reply to and forward a received message using available features 2.7 Open and save an attachment to the relevant folder 2.8 Search for, sort and save email message using available settings 2.9 Adjust email accounts to restrict and quarantine possible email security problems 2.10 Print email message as required
3. Search the internet	3.1 Review organisational guidelines on internet access 3.2 Open internet application and locate and access a search

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ELEMENT	PERFORMANCE CRITERIA
	engine on the internet, and define search expressions based on data required 3.3 Enter appropriate key words into the search engine to locate desired information 3.4 Refine a search depending on outcomes of original search 3.5 Save search expression results and present them in a report according to information requirements 3.6 Create a bookmark within the internet browser or a link for the required web page for the key results 3.7 Save key results in a bookmark folder 3.8 Modify internet browser options for printing and print a web page 3.9 Close internet browser
4. Access and use consumer specific sites on the internet	4.1 Identify, access and review information specific sites to gain consumer information 4.2 Identify and use internet application sites to lodge details and gain access and information 4.3 Access and use online forms on the internet
5. Undertake online transactions	5.1 Access online transaction site 5.2 Ensure security of transaction site 5.3 Enter required information into fields on merchant's website 5.4 Ensure pop-up dialog boxes, prompts or feedback mechanisms are completed 5.5 Enter, check and make changes to preferred transaction options 5.6 Complete online transaction 5.7 Record and archive receipts according to business processes 5.8 Close down and leave transaction process
6. Conduct an advanced search	6.1 Use search tools and advanced search features 6.2 Use Boolean search techniques when required to enhance the search 6.3 Use multiple or meta-search tools with a range of key words 6.4 Use search engines particular to a field of knowledge to refine the outcome 6.5 Access related virtual community sites and newsgroups, and

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ELEMENT	PERFORMANCE CRITERIA
	note their objectives and operational arrangements 6.6 Conduct a search with domain names to refine the search
7. Use information that has been located	7.1 Cross reference information found by using several websites to determine accuracy of information 7.2 Check date that website was last updated or properties of website to determine currency of information 7.3 Determine website authority by looking at copyright statements, privacy statements and organisational information 7.4 Save and print information found in different file forms

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 1.6, 2.1, 2.6-2.8, 3.1, 3.2, 4.1-4.3, 5.1, 5.2, 5.4, 5.5, 6.5, 7.1-7.3	• Interprets textual information and instructions to efficiently undertake the task
Writing	2.1-2.3, 3.5, 5.3, 5.4, 5.7	• Uses required format to accurately enter information specific to requirements • Composes short and specific messages using format, grammar and language appropriate to audience
Navigate the world of work	1.7	• Understands main responsibilities and boundaries of own role
Get the work done	1.1-1.8, 2.1, 2.3-2.10, 3.2-3.9, 4.1-4.3, 5.1-5.8, 6.1-6.6, 7.4	• Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing • Understands the purpose and specific functions of common digital tools used in work contexts • Recognises and responds to common operational problems when using web browsers • Takes responsibility for routine low-impact decisions within familiar situations • Implements basic security requirements related to own tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT103 Use, communicate and search securely on the internet	ICAICT103A Use, communicate and search securely on the internet	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT103 Use, communicate and search securely on the internet

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- connect to and access the internet
- send and receive emails
- secure internet access and email communications
- use search tools to locate information
- use different internet search techniques
- research and select appropriate website
- undertake online transactions
- assess the accuracy, currency, authority and reliability of the site and information located.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must :

- list basic technical terminology related to reading help files and prompts
- describe the basics of copyright and privacy statements
- explain different types of messages that occur, including error messages and messages to install plug-ins
- list different types of search engines and web browsers
- list procedures for using email applications
- list procedures for evaluating and assessing the authority, reliability and authenticity of information
- outline internet search functions
- describe internet speed and traffic loads related to times of accessing the internet
- describe the makeup and structure of internet addresses
- list organisational guidelines on internet and email use (web etiquette or netiquette)
- describe business process related to online transactions
- describe web browser update techniques
- explain what key words and bookmarks are used for.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer or digital device with internet
- search engines currently used in industry
- organisational policies on internet usage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT104 Use digital devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use a range of digital devices, such as a digital camera, video camera, or personal digital assistant (PDA) device.

It applies to individuals who require entry level information and communications technology (ICT) knowledge and literacy skills to support their work in a home office or small office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use the digital device	1.1 Review the instruction manual and ensure identified components are available 1.2 Identify the physical components of the digital device 1.3 Turn on and follow access procedures to activate the digital device 1.4 Alter the digital device settings to best suit intended use 1.5 Configure power management settings where appropriate to minimise power consumption, as an environmentally sustainable measure
2. Set up and use the digital device	2.1 Identify and set the basic operating, security and menu settings 2.2 Navigate and manipulate the screen environment 2.3 Customise screen icons and access to applications where applicable 2.4 Use the digital device, and save and edit output where applicable 2.5 Identify more advanced features available and use as required
3. Access and use basic connectivity devices	3.1 Connect to external digital devices, such as computer devices or storage devices, to retrieve, copy, move and save information 3.2 Check physical connectivity of computer devices or storage devices to ensure operation and performance 3.3 Connect to a printer either through a computer device or directly, and use printer settings and print data 3.4 Access audio-visual devices to view and play a multimedia file
4. Shut down digital device	4.1 Save current work and back up important data 4.2 Close open programs on the digital device and any computer device or storage device 4.3 Shut down digital devices, according to manufacturer instructions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.5, 3.1, 3.4, 4.3	• Reviews on-line and hard-copy text, and interprets and comprehends symbols, text, numbers and letters to determine and adhere to requirements
Get the work done	1.1-1.5, 2.1-2.5, 3.1-3.4, 4.1-4.3	• Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Plans a range of routine tasks with familiar goals and outcomes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT104 Use digital devices	ICAICT104A Use digital devices	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT104 Use digital devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- turn on a digital device
- use the menu features and navigate a graphical user interface
- use device features to perform tasks
- save the results of work.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must :

- outline the capabilities and connectivity requirements of relevant:
  - audio-visual devices
  - peripheral devices
  - storage devices
- list basic security functions
- explain basic software operation and associated applications
- explain digital device functions
- explain digital device settings.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry and include access to:

- digital devices
- computer
- storage devices
- printer
- device-specific application currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT105 Operate spreadsheet applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use spreadsheet applications, including creating spreadsheets, formatting data, incorporating charts and objects, and printing spreadsheets.

It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets under direct supervision or with limited responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create spreadsheets	1.1 Open the spreadsheet application, create spreadsheet files and enter numbers, text and symbols into cells according to information requirements 1.2 Enter simple formulas and functions using cell referencing when required 1.3 Correct formulas when error messages occur 1.4 Use a range of common tools during spreadsheet development 1.5 Edit columns and rows within the spreadsheet 1.6 Use the auto-fill function to increment data where required 1.7 Save the spreadsheet to a folder on a storage device
2. Customise basic settings	2.1 Adjust page layout to meet user requirements or special needs 2.2 Open and view different toolbars 2.3 Change font settings so they are appropriate for the document purpose 2.4 Change alignment options and line spacing according to spreadsheet formatting features 2.5 Format cell to display different styles as required 2.6 Modify margin sizes to suit the purpose of the spreadsheets 2.7 View multiple spreadsheets concurrently
3. Format spreadsheet	3.1 Use formatting features as required 3.2 Copy selected formatting features from another cell in the spreadsheet or from another active spreadsheet 3.3 Use formatting tools as required within the spreadsheet 3.4 Align information in a selected cell as required 3.5 Insert headers and footers using formatting features 3.6 Save spreadsheet as another file type 3.7 Save to storage device and close spreadsheet
4. Incorporate object and	4.1 Import an object into an active spreadsheet

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ELEMENT	PERFORMANCE CRITERIA
chart in spreadsheet	4.2 Manipulate imported object by using formatting features 4.3 Create a chart using selected data in the spreadsheet 4.4 Display selected data in a different chart 4.5 Modify chart using formatting features
5. Print spreadsheet	5.1 Preview spreadsheet in print preview mode 5.2 Select basic printer options 5.3 Print spreadsheet or selected part of spreadsheet 5.4 Submit the spreadsheet to appropriate person for approval or feedback

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1	• Interprets and comprehends symbolic, textual and numerical information and data • Identifies data specifically needed for the spreadsheet from information received
Writing	1.1, 1.2, 1.5, 3.5, 4.5	• Enters both written and verbally received information and data into a format suitable for spreadsheet analysis • Selects vocabulary, terminology and naming conventions suitable for the spreadsheet
Oral Communication	1.1, 2.1, 5.4	• Uses simple and relevant language with listening and questioning skills to confirm user requirements and elicit feedback
Numeracy	1.2, 4.3, 4.4	• Adds, subtracts, multiplies and divides whole numbers and decimals, identifying and selecting the correct formulas and functions to use • Applies the order of operations in calculations • Identifies and comprehends the specific numeric data needed to create charts
Interact with others	5.4	• Begins to use some routine forms of written communication relevant to immediate work role, with a limited awareness of requirements and expectations
Get the work done	1.1-1.7, 2.1-2.7, 3.1-3.7, 4.1-4.5, 5.1-5.3	• Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing • Understands the purpose and specific functions of common digital tools used in work contexts • Takes responsibility for routine low-impact decisions within familiar situations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT105 Operate spreadsheet applications	ICAICT105A Operate spreadsheet applications	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT105 Operate spreadsheet applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create spreadsheets
- customise basic settings
- format spreadsheets
- create basic formulas
- insert objects and charts in spreadsheets
- save and print spreadsheets.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list basic technical terminology related to reading help files and prompts
- explain the effect of formatting and appearance on the readability and usability of spreadsheets
- outline log-in procedures relating to accessing a personal computer (PC)
- describe the purpose, use and function of spreadsheet applications.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) and printer
- spreadsheet software currently used in industry
- documents detailing organisational style guide and policy
- documents or information containing data suitable for creating spreadsheets.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT106 Operate presentation packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to perform basic tasks using a presentation application package, and includes creating, formatting and adding effects to presentations.

It applies to individuals employed in a range of work environments who need to be able to present a set range of data in a simple and direct format.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create presentations	1.1 Open presentation package and create a simple design for a presentation according to organisational requirements 1.2 Open blank presentation and add text and graphics 1.3 Apply existing styles within a presentation 1.4 Use presentation template and slides to create a presentation 1.5 Use various tools to improve the look of the presentation 1.6 Save presentation to the appropriate storage device and folder
2. Customise basic settings	2.1 Adjust display to meet user requirements 2.2 Open and view different toolbars to view options 2.3 Ensure font settings are appropriate for the presentation purpose 2.4 View multiple slides at once
3. Format presentations	3.1 Use and incorporate organisational charts and bulleted lists, and modify as required 3.2 Add objects and manipulate to meet presentation purposes 3.3 Import objects and modify for presentation purposes 3.4 Modify slide layout, including text and colours, to meet presentation requirements 3.5 Use formatting tools as required within the presentation 3.6 Duplicate slides within and across a presentation 3.7 Reorder sequence of slides and delete slides for presentation purposes 3.8 Save presentation in another format 3.9 Save to storage device and close presentation
4. Add slide show effects	4.1 Incorporate pre-set animation and multimedia effects into presentation as required to enhance the presentation 4.2 Add slide transition effects to presentation to ensure smooth progression through the presentation 4.3 Test presentation for overall effect

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ELEMENT	PERFORMANCE CRITERIA
	4.4 Use onscreen navigation tools to start and stop slide show or move between different slides as required
5. Print presentation and notes	5.1 Select appropriate print format for presentation 5.2 Select preferred slide orientation 5.3 Add notes and slide numbers 5.4 Preview slides and run spell check before presentation 5.5 Print selected slides and submit presentation to appropriate person for feedback

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1,5, 2.1, 4.3, 5.4	• Reviews on-line and hardcopy text, and identifies relevant organisational and job requirements • Interprets and comprehends symbols, text, numbers and letters necessary for operating computer hardware and software
Writing	1.2, 5.3	• Uses appropriate terminology and plain English to enhance the presentation and add notes
Oral Communication	1.1, 2.1, 5.5	• Uses effective questioning and listening techniques, and simple and relevant terminology to clarify requirements and obtain feedback
Numeracy	3.7, 4.1	• Counts, adds and subtracts whole numbers and fractions for sequencing and timing purposes
Interact with others	5.5	• Begins to use routine forms of written communication relevant to immediate work role with a limited awareness of requirements and expectations
Get the work done	1.1-1.6, 2.1-2.4, 3.1-3.9. 4.1-4.4, 5.1, 5.4, 5.5	• Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing • Understands purpose and specific functions of common digital tools used in work contexts • Takes responsibility for routine, low-impact decisions within familiar situations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT106 Operate presentation packages	ICAICT106A Operate presentation packages	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT106 Operate presentation packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create, format and prepare presentations for distribution and display
- customise basic settings
- add slide show effects.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list basic technical terminology to read help files and prompts
- outline the different types of:
  - formal and informal presentations
  - audience
- explain the effect of design and formatting on the readability and usability of presentations
- outline presentation pitfalls
- identify suitable presentation effects for different audiences.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) and printer
- presentation software currently used in industry
- documents detailing organisational style guide and policy.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT107 Use personal productivity tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use the features and components of a range of personal productivity tools.

It applies to individuals who perform routine tasks in the workplace and use a range of current technology based personal productivity tools, under direct supervision or with limited responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use calendar features	1.1 Navigate within the calendar of the personal productivity tool and schedule events and appointments 1.2 Set a reminder and customise the reminder 1.3 Customise the calendar views, menus and toolbars, and work within different views 1.4 Delete events and appointments 1.5 Customise the calendar's print options and print the calendar according to format requirements
2. Use contact management	2.1 Create, edit and delete contacts as required, recording information in the appropriate fields 2.2 Use contact information for email purposes according to organisational policies related to privacy 2.3 Group contacts into categories that are consistent and meaningful
3. Use additional features	3.1 Link activities and contacts when required 3.2 Use expense sheets, search facilities, notes and email when appropriate 3.3 Integrate the above features with other applications or the calendar and contacts list

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1, 2.2	• Interprets and comprehends a large range of signs, symbols, pictures, text, numbers and letters necessary to operate a range of personal productivity tools • Interprets instructions containing basic words and sentence structures
Writing	1.1, 1.2, 2.1, 2.2, 3.2	• Enters written information using simple sentence structure, correct terminology, and writing conventions suitable for personal productivity tools
Numeracy	1.1, 1.2, 3.2	• Counts, adds, subtracts, multiplies and divides whole numbers and fractions and decimals to schedule appointments and use expense sheets
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.3	• Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role • Understands the purpose and specific functions of common digital tools used in work contexts • Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing and timing

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT107 Use personal productivity tools	ICAICT107A Use personal productivity tools	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

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Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT107 Use personal productivity tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use the calendar of the personal productivity tool to schedule events and appointments
- create, edit and delete contacts
- use the additional features of a particular personal productivity tool and software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline organisational policies regarding:
  - email list
  - internet connection and usage policy
  - web etiquette
  - calendar and scheduling tools.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry and include access to:

- a personal productivity device
- organising software currently used in industry
- organisational policies on internet usage.

Assessors must satisfy NVR/AQTF assessor requirements.

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Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT108 Use digital literacy skills to access the internet

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to safely and securely use the internet to undertake basic interactive communication.

It applies to individuals who locate, organise, understand, evaluate and analyse information using digital technology in a range of different areas.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Operate hardware at a basic level	1.1 Identify hardware components required to connect to the Internet 1.2 Set up and check physical connectivity of devices 1.3 Use hardware components and comply with work health and safety (WHS) guidelines
2. Ensure safe and secure online access	2.1 Connect and access relevant internet sites 2.2 Provide an appropriate level of personal information to maintain privacy and security 2.3 Comply with copyright and intellectual property legislation 2.4 Ensure an understanding of socially responsible behaviour 2.5 Assess the legitimacy of online requests to make an informed decision 2.6 Interpret and respond to security notifications that display due to browser software security settings or internet use 2.7 Assess email status and determine email security 2.8 Provide appropriate information to manage digital footprint 2.9 Assess security of payments 2.10 Back up data as required through downloading to an external backup device
3. Research and analyse online information	3.1 Identify and use search engines to access relevant internet sites 3.2 Search and find relevant information or content 3.3 Refine search to increase relevance of information or content 3.4 Navigate a website to access the information or content required 3.5 Assess payment requirements to make sound financial decisions 3.6 Analyse the usefulness and accuracy of located information
4. Make transactions and participate online	4.1 Create, register, manage and secure an account 4.2 Observe appropriate user protocol online

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ELEMENT	PERFORMANCE CRITERIA
	4.3 Make secure transactions and identify methods of internet fraud 4.4 Identify and invite relevant friends, groups and pages to own website
5. Use applications and manipulate files	5.1 Use basic application skills 5.2 Incorporate attachments to documents 5.3 Back up files to external storage devices 5.4 Upload relevant components to a website 5.5 Download pictures and videos to an external device

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.3, 2.5-2.7, 3.1, 3.6, 4.1	• Recognises and comprehends a large range of signs, symbols, pictures, jargon, text, numbers and letters necessary to operate web browsers, operating systems, search engines and application packages, and to evaluate web page content
Writing	2.1, 2.2, 2.8, 2.10, 3.2, 3.3, 4.1, 4.4	• Enters text and data using keystrokes and adhering to the software program requirements • Structures and orders search queries using relevant search conventions, jargon, acronyms, symbols and wildcards to obtain optimum search results
Navigate the world of work	1.3, 2.3	• Takes some personal responsibility for adherence to legal and regulatory requirements
Get the work done	1.1-1.3, 2.1, 2.5-2.10, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.1-4.4, 5.1-5.5	• Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing • Understands purpose and specific functions of common digital tools used in work contexts • Takes responsibility for routine, low-impact decisions within familiar situations • Implements basic security requirements related to own tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT108 Use digital literacy skills to access the internet	ICAICT108A Use digital literacy skills to access the Internet	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT108 Use digital literacy skills to access the internet

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- connect to and access the internet
- send and receive emails
- secure internet access and email communications
- use search tools to locate information or content
- research and select appropriate websites
- undertake online interactions
- make an informed assessment of the accuracy, currency, authority and reliability of the site and information located.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list types and basic components of hardware and storage devices
- list different categories of domain names and explain how they indicate the integrity of the materials on the web site
- identify and explain common automated messages found when accessing the web
- outline types of online communication and participation, including transactional
- outline basic research techniques
- outline basic copyright legislation
- explain digital footprint and basic security, safety and legal issues
- list work health and safety (WHS) issues, including basic ergonomics of keyboard and computer use
- identify device interfaces
- Identify desk top icons
- explain basic principles of web browser search engines
- outline internet protocols
- explain basic principles and features of web browsers and search engines.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- hardware with internet access
- search engines currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT201 Use computer operating systems and hardware

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select, configure and use computer operating systems and basic computer hardware, including configuring the operating system to work with a variety of hardware peripherals and types of information and communications technology (ICT) equipment.

It applies to individuals who may work under supervision and provide support to others using a range of skills to identify and resolve issues.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify operating system and hardware components	1.1 Determine ICT organisational requirements and specifications 1.2 Identify and select the operating system 1.3 Identify appropriate external hardware components 1.4 Identify internal hardware components
2. Install and configure operating system and application software with hardware components	2.1 Install and configure the operating system to meet organisational requirements 2.2 Identify functions associated with the operating system and associated boot process 2.3 Configure power management settings to minimise power consumption, as an environmentally sustainable measure 2.4 Use both the graphical user interface and the command line interface to perform basic tasks 2.5 Install or upgrade application software onto the operating system and hardware configuration 2.6 Determine the relationship between an application program, the operating system and hardware 2.7 Identify general differences between different computer platforms and their respective operating systems
3. Optimise operating system and hardware components	3.1 Optimise operating system, using included tools or third-party utilities 3.2 Customise the graphical user interface 3.3 Use techniques unique to the command line interface 3.4 Set up and configure external hardware components and check functionality 3.5 Install drivers as appropriate and check functionality

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1-2.7, 3.1-3.5	• Identifies and reviews both on-line and hard-copy text containing simple sentences with terminology relevant to the ICT industry • Interprets and comprehends diagrams, icons, symbols, text, numbers and letters necessary to install and configure operating systems, software and hardware
Writing	2.1, 2.4, 2.5, 3.3	• Uses systems related syntax, text and numbers to input commands • Uses correct terminology, text, letters and numbers to respond to computer generated prompts
Get the work done	1.1-1.4, 2.1-2.7, 3.1-3.5	• Plans routine tasks with familiar goals and outcomes, taking limited responsibility for decisions regarding sequencing and timing • Understands purposes, specific functions and key features of common digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT201 Use computer operations systems and hardware	ICAICT201A Use computer operations systems and hardware	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT201 Use computer operating systems and hardware

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use an operating system in a variety of scenarios and across functions, including:
  - scheduling, loading, initiating, and supervising the execution of programs
  - allocating storage
  - initiating and controlling input and output operations
  - handling errors
- identify and install suitable hardware components
- install and upgrade application software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the basic specifications of current industry accepted operating systems, hardware and applications software products
- explain the compatibility of an operating system, in respect to other versions
- explain the function of single-user and multi-user operating systems
- explain interoperability between operating systems
- outline work health and safety (WHS) principles and responsibilities, including ergonomic principles to avoid injury associated with using computer systems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- hardware components
- work health and safety (WHS) standards and organisational policy and procedures
- an operating system currently used in industry
- software configuration guides
- documents detailing operating system control panel and configuration data.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT202 Work and communicate effectively in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to work and communicate effectively within organisational policies and governance arrangements, using information and communications technology (ICT) systems, equipment and software.

It applies to individuals who may work under supervision with responsibility to support others within a small office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to communicate and work effectively within an ICT organisation	1.1 Gather input from sources of information to develop, refine and document ICT roles and services in an organisation 1.2 Develop clear knowledge of enterprise policies, procedures and organisational requirements, including principles of equal employment opportunity (EEO) and anti-discrimination 1.3 Identify ICT policy and procedures, and determine whether they are applied in practice 1.4 Determine key players within the organisation and their role and importance
2. Use positive and varied communication strategies with ICT clients	2.1 Receive requests and enquiries regarding use of ICT equipment, operating systems and software from clients and colleagues in a polite and appropriate manner 2.2 Respond appropriately to client and colleague requirements, and identify options 2.3 Present written information and ideas in clear and concise language to ensure the intended meaning is understood 2.4 Record information or messages and refer client requests to the appropriate person according to organisational procedures 2.5 Inform client of the progress of their request or enquiry and advise them of the organisational process for answering their request or enquiry 2.6 Escalate inquiries that cannot be satisfied immediately 2.7 Supply follow-up information to client as required in a timely manner 2.8 Accommodate cultural differences in the workplace

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.1	• Reviews and evaluates a range of textual information to identify relevant information relating to the job role, enquiry and organisation
Writing	1.1, 1.3, 2.2-2.4	• Uses correct terminology, naming conventions and clear and detailed language to convey explicit information, requirements and recommendations • Records key information in a sequential manner, using correct spelling and grammar in a format appropriate to audience
Oral Communication	1.1, 1.2, 1.4, 2.1-2.3, 2.5-2.8	• Uses effective questioning and active listening techniques to elicit information about job roles and clarify client queries • Contributes to an effective working environment by communicating with others in a timely and courteous manner and using clear, easy-to-understand and non-discriminatory language and behaviour
Navigate the world of work	1.2	• Takes some personal responsibility for adherence to legal and regulatory requirements
Interact with others	2.7, 2.8	• Seeks to cooperate with others to achieve results in immediate work context • Selects from small range of communication modes, forms and channels to meet a specific purpose within the immediate work context
Get the work done	1.1, 1.4	• Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing • Understands the purpose and specific functions of common digital tools used in work contexts • Uses digital technology for basic reading, recording and searching information, and for communications following routine procedures and security requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT202 Work and communicate effectively in an ICT environment	ICAICT202A Work and communicate effectively in an IT environment	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT202 Work and communicate effectively in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- gather information about the organisation and incorporate in communications
- process internal and external requests according to organisational policies and requirements
- respond promptly to client enquiries and requests from colleagues.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe current industry accepted hardware and software including:
  - features and capabilities
  - product directions
- outline the operational environment, including the:
  - customer base
  - company products
  - services
- outline the organisational policies and procedures that cover:
  - code of conduct
  - mission statement
  - routine work processes
  - systems, management structure and governance arrangements
- outline the principles of equal employment opportunity (EEO) and anti-discrimination
- explain the role and positioning of information and communications technology (ICT) within the overall business objectives of the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a workstation
- a range of ICT equipment, operating systems, software and technical information
- organisational policies, procedures and governance documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT203 Operate application software packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, select and operate three commercial software packages, including a word-processing and a spreadsheet application package.

It applies to individuals who utilise different software applications within a small to large office environment to produce diverse documents.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use appropriate workplace health and safety (WHS) office work practices	1.1 Use safe work practices to ensure ergonomic, work organisation, energy and resource conservation requirements are addressed 1.2 Use wrist rests and document holders where appropriate 1.3 Use monitor anti-glare and radiation reduction screens where appropriate
2. Use appropriate word-processing software	2.1 Select word-processing software appropriate to perform activity 2.2 Identify document purpose, audience and presentation requirements, and clarify with personnel as required 2.3 Identify organisational requirements for text-based business documents, and design document structure and layout to ensure consistency of style and image 2.4 Match document requirements with software functions to provide efficient production of documents 2.5 Use technical functions, other data and formatting to finalise documents 2.6 Ensure the naming and storing of documents in appropriate directories or folders and the printing of documents to the required specifications
3. Use appropriate spreadsheet software	3.1 Select spreadsheet software appropriate to perform activity 3.2 Identify document purpose, audience and presentation requirements, and clarify with personnel as required 3.3 Enter simple formulas and functions using cell referencing where required 3.4 Customise spreadsheet settings to meet requirements 3.5 Ensure the naming and storing of documents in appropriate directories or folders and the printing of documents to the required specifications
4. Use a third application software package	4.1 Select software application package appropriate to perform activity 4.2 Identify purpose, audience and presentation requirements, and clarify with personnel as required

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ELEMENT	PERFORMANCE CRITERIA
	4.3 Use technical functions, other data and formatting to finalise documents 4.4 Ensure documents are named and stored in appropriate directories or folders and printed to required specifications

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2-2.5, 3.2-3.4, 4.2, 4.3	• Recognises and interprets textual information to determine organisational standards and job requirements • Interprets and comprehends symbols, icons and text associated with applications software
Writing	2.3-2.6, 3.3- 3.5, 4.3, 4.4	• Enters both written and verbally received information and data into a format suitable for the software application • Selects vocabulary, syntax, terminology, labelling and naming conventions suitable for the program
Oral Communication	2.2, 2.3, 3.2, 4.2	• Uses simple, relevant language, effective questioning, and active listening techniques to clarify work requirements
Numeracy	3.2-3.4	• Adds, subtracts, multiplies and divides whole numbers and decimals, identifying and selecting the correct formulas and functions to use • Applies the order of operations in calculations
Navigate the world of work	1.1	• Takes some personal responsibility for adherence to legal and regulatory requirements
Get the work done	1.2, 1.3, 2.1-2.6, 3.1-3.5, 4.1-4.4	• Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role • Understands purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks, adapting some functions to improve personal efficiency • Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT203 Operate application software packages	ICAICT203A Operate application software packages	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT203 Operate application software packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce workplace documents using a minimum of three different software application packages
- open, amend and save files and documents according to organisational requirements
- apply workplace health and safety (WHS) principles and responsibilities for ergonomics, such as work periods and breaks
- use help manuals and online help.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify application software packages used by the organisation and list the purpose of each
- explain basic technical terminology related to reading help files and responding to system help prompts
- outline current business practices related to using software to prepare reports
- list features and functions of commercial computing packages
- describe import and export software functions
- describe the process of linking documents
- outline WHS principles and responsibilities for ergonomics, such as work periods and breaks
- explain the purpose of input and output devices.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) and printer
- software currently used in industry
- documents detailing organisational style guide and policy
- documents or information containing data suitable for developing software application documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT204 Operate a digital media technology package

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, select and use a digital media package and supporting technologies to produce a variety of media rich documents.

It applies to individuals who may work under supervision within a small to large office environment and have responsibility for completion of designated tasks, using a range of practical skills and basic technical knowledge.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use appropriate workplace health and safety (WHS) office work practices	1.1 Use safe work practices to ensure ergonomic, work organisation, energy and resource conservation requirements are addressed 1.2 Use wrist rests and document holders where appropriate 1.3 Use monitor anti-glare and radiation reduction screens where appropriate
2. Identify and select appropriate digital media package	2.1 Identify the basic requirements of a design brief, including user environment 2.2 Research and review suitable available digital media packages 2.3 Select an appropriate digital media package to meet design brief requirements
3. Use digital media package	3.1 Procure or create suitable data to meet requirements of the brief 3.2 Manipulate data using digital media package tools 3.3 Ensure naming and storing of documents in appropriate file format in directories or folders
4. Review digital media design	4.1 Evaluate design for creative, dramatic and technical quality, file size, and suitability to meet the brief 4.2 Test and run any incorporated graphics, video or sound as part of a digital media presentation and present designs in the appropriate format 4.3 Review final product against design brief

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 3.1, 3.3, 4.3	• Recognises and interprets textual and diagrammatic information to select appropriate digital media packages • Interprets systems related icons, text and diagrams
Writing	3.1-3.3	• Enters written and verbally received information and data into a format suitable for the digital media package • Selects vocabulary, syntax, terminology, labelling and naming conventions to meet program and design requirements
Numeracy	3.1, 3.2	• Adds and subtracts whole numbers, fractions and decimals to calculate time, audio output, graphic dimensions and file size
Navigate the world of work	1.1	• Takes some personal responsibility for adherence to legal and regulatory requirements
Get the work done	1.1-1.3, 2.1- 2.3, 3.1-3.3, 4.2	• Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role • Understands purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks, adapting some functions to improve personal efficiency • Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT204 Operate a digital media technology package	ICAICT204A Operate a digital media technology package	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT204 Operate a digital media technology package

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret basic requirements of a design brief
- use digital media package to meet organisational requirements
- apply workplace health and safety (WHS) principles and responsibilities for ergonomics, such as work periods and breaks
- use help manuals and online help when appropriate
- use digital media technologies to support design brief requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the basic principles of visual design
- outline the functions and features of digital media packages and technologies
- identify graphic design and stylistic language conventions
- outline WHS principles and responsibilities for ergonomics, such as work periods and breaks
- outline the principles of digital imaging and file formats, video and sound file formats, file management and transfer systems
- identify vendor product directions in digital media hardware and software
- explain how to visualise and interpret creative information, scripts (text) and images.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) and printer
- software currently used in industry
- documents detailing organisational style guide and policy
- documents or information containing data suitable for developing software application documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTICT205 Design basic organisational documents using computing packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, create and produce basic organisational documents using application software within organisational guidelines, procedures and policies.

It applies to individuals who need to use foundation information and communications technology (ICT) skills in a wide range of varying industry occupations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design documents to meet organisational needs	1.1 Determine basic design guidelines and requirements 1.2 Select appropriate application software 1.3 Use application software to design and configure document templates for use in a business environment
2. Use application software to develop documents	2.1 Use application software as per specifications to develop documents 2.2 Access, retrieve, manipulate and save document files 2.3 Amend designs according to organisational requirements 2.4 Store documents for wider access and editing as required
3. Evaluate and incorporate feedback	3.1 Obtain document sign-off from appropriate person 3.2 Incorporate feedback and update document

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.2	• Recognises and interprets text to determine organisational guidelines and requirements, and application software specifications
Writing	1.3, 2.1, 3.2	• Uses appropriate and clear language and organisational protocols for labels and filenames when designing templates and developing documents
Oral Communication	1.1, 3.1	• Uses simple, relevant language, effective questioning, and active listening techniques to clarify work requirements and obtain feedback
Numeracy	1.3, 2.1, 2.3	• Takes measurements and performs calculations for document layout
Get the work done	1.2, 1.3, 2.1-2.4, 3.2	• Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role • Understands purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks, adapting some functions to improve personal efficiency • Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing • Uses the main features and functions of digital tools to complete work tasks and access information

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT205 Design basic organisational documents using computing packages	ICAICT205A Design basic organisational documents using computing packages	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT205 Design basic organisational documents using computing packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a workplace document using a range of features
- develop several workplace documents with minimal instruction on their design from end user or supervisor.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify features of application packages
- explain current business practices related to preparing organisational documents
- recognise industry standard input and output devices
- identify organisational documentation and style guides
- identify organisational storage and retrieval procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- organisational requirements and a template for the documents
- a personal computer (PC), scanner and laser printer
- word-processing facilities
- presentation software applications.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT206 Install software applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select, install or upgrade basic commercial software applications.

It applies to individuals who require basic information and communications technology (ICT) skills to undertake related tasks under supervision.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine software or software upgrade requirements	1.1 Document client requirements and report to appropriate person 1.2 Act on instructions to meet client requirements, according to organisational requirements
2. Obtain software or software upgrade	2.1 Investigate and select a software application program that best conforms to requirements and organisational policies 2.2 Obtain application program under instruction from appropriate person 2.3 Determine licensing requirements and record, according to organisational guidelines 2.4 Ensure target computer conforms to the minimum hardware and operating system requirements of the application program
3. Install or upgrade software	3.1 Install new or upgraded software application program according to appropriate person or organisational instructions 3.2 Complete the installation process efficiently and effectively to minimise disruption 3.3 Carry out testing and acceptance, according to organisational guidelines, paying particular attention to possible effect on other systems 3.4 Ensure client requirements are satisfied 3.5 Refer outstanding client issues to appropriate person as necessary

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.3	• Uses available literature to appropriately address requirements • Interprets and responds to complex text to ascertain and confirm requirements
Writing	1.1, 2.3	• Records key information relevant to requirements, using basic punctuation, text and correct spelling
Oral Communication	1.1, 2.2, 3.1, 3.4, 3.5	• Uses listening and questioning techniques to confirm understanding of requirements • Uses clear and specific language to convey requirements
Navigate the world of work	2.1	• Takes some personal responsibility for adherence to organisational requirements
Get the work done	1.2, 2.1, 2.2, 2.4, 3.1-3.3	• Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role • Understands purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT206 Install software applications	ICAICT206A Install software applications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT206 Install software applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install software applications through operating system instructions
- configure computer to accept new software or upgrade
- carry out testing and acceptance according to organisational guidelines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe a typical client business domain
- identify typical hardware storage devices
- identify typical input and output devices
- describe key licensing arrangements and responsibilities to ensure they are adhered to
- identify operating systems supported by the organisation
- describe the organisational guidelines for purchasing
- identify the installation requirements for key software application packages
- describe typical software copyright responsibilities.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) where software installation may be performed
- application software currently used in industry
- documents detailing organisational testing and acceptance policy and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT207 Integrate commercial computing packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manipulate, convert and integrate data between two or more different commercial software applications.

It applies to individuals who require foundation skills and knowledge to use information and communications technology (ICT) in any ICT business or office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine work requirements	1.1 Identify the task requirement 1.2 Select appropriate software and file formats to perform required work 1.3 Obtain organisational documentation, such as procedures, manuals and guides, and use when appropriate
2. Integrate data across different software application packages	2.1 Create a mailing list using a database, spreadsheet or address book, and merge mailing list with another document 2.2 Use software application package conversion tool to convert data from one format to another to enable additional work on the converted data 2.3 Save data to a new file format 2.4 Import objects from another software application package and modify as required to produce a required outcome 2.5 Export data to another software application package to produce a required outcome 2.6 Create a link between one software application package and another, and use this to update information to a document
3. Save and retrieve data with the aid of help functions	3.1 Save data to disk 3.2 Convert data to a new file format 3.3 Re-access data and check information 3.4 Access user help documentation or other resources for basic difficulties with software application package

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 3.4	• Recognises and interprets text with ICT specific terminology to determine task requirements, organisational guidelines and use application software
Oral Communication	1.1, 3.4	• Uses effective listening and questioning techniques to elicit information about task requirements to resolve basic difficulties
Navigate the world of work	1.3	• Generally follows the explicit protocols immediately related to role
Get the work done	1.1, 1.2, 2.1- 2.3, 2.5, 2.6, 3.1-3.3, 3.4	• With assistance, determines priorities and sequences the steps involved in clearly defined, familiar tasks, and identifies and assembles the resources required • Recognises and responds to predictable routine problems related to role in the immediate work context • Understands the purpose and specific functions of common digital tools used in work contexts • Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT207 Integrate commercial computing packages	ICAICT207A Integrate commercial computing packages	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT207 Integrate commercial computing packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select appropriate software and file formats
- create mailing list and merge with another document
- manipulate and integrate data between commercial application software following organisational procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline current business practices related to preparing reports
- identify features and functions of commercial computing packages
- identify import and export software functions
- outline processes for linking documents
- outline workplace health and safety (WHS) principles and responsibilities for ergonomics
- identify software packages used by the organisation
- outline strategies for integrating commercial computing packages
- outline the use of input and output devices.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) and printer
- software currently used in industry
- documents detailing organisational style guide and policy
- documents or information containing data suitable for use with multiple computing packages.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT208 Operate accounting applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to operate common accounting software packages in order to maintain enterprise financial records.

It applies to individuals working with little supervision who use information and communications technology (ICT) skills and knowledge to support the financial area within a small to large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Customise software	1.1 Select accounting software to meet business requirements 1.2 Load, register and configure accounting software according to operating instructions
2. Create enterprise data	2.1 Establish chart of accounts according to business and legislative requirements 2.2 Create and add data on customers and sales 2.3 Create and add data on suppliers and purchases 2.4 Create and add payroll details 2.5 Create and add inventory details 2.6 Add required or suitable tax codes
3. Record and track transactions	3.1 Generate invoices and track their progress 3.2 Record customer payments and update customer details 3.3 Record and track purchases 3.4 Record payment of wages, allowances, taxation and superannuation 3.5 Update business data as required
4. Save and back up data	4.1 Save accounting data to disk 4.2 Make a regular backup of accounting data and store in a safe location
5. Generate reports	5.1 Reconcile accounts 5.2 Generate and print financial reports based on accounting data 5.3 Check financial reports for errors and discrepancies 5.4 Discuss errors with appropriate person and rectify as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 5.3, 5.4	• Identifies and interprets textual and numerical financial information necessary to maintain organisational accounting records • Interprets textual information from relevant sources to identify the most appropriate software to use, and business and legislative requirements
Oral Communication	1.1, 1.2, 2.1, 5.4	• Uses plain English, effective listening and questioning techniques and, where necessary, finance specific terminology to elicit information and discuss issues
Numeracy	2.1-2.6, 3.1-3.5, 5.1-5.4	• Interprets numerical information containing whole numbers, decimals and percentages, and applies a range of mathematical calculations to ensure organisational financial requirements are met
Navigate the world of work	2.1	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1, 1.2, 2.2- 2.6, 3.1-3.5, 4.1, 4.2, 5.1, 5.4	• Plans a range of routine and some non-routine tasks, accepting stated goals and aiming to achieve them efficiently • Understands the purpose, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Uses familiar digital systems and tools to access, organise, analyse and display information relevant to role

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT208 Operate accounting applications	ICAICT208A Operate accounting applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTICT208 Operate accounting applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- load and configure accounting software
- create and maintain enterprise financial records as per business and legislative requirements
- record and track transactions
- back up data
- reconcile accounts and generate reports.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss basic accounting concepts, including:
  - assets
  - cost of sales
  - creditors
  - debtors
  - equity
  - expenses
  - income
  - liabilities
- identify basic accounting devices, including:
  - accounts
  - chequebook register
  - general ledger
  - invoices
  - purchases
  - sales journals
  - transaction journals
- outline current legislative requirements relating to enterprise requirements, including:
  - goods and services tax
  - income tax rates
  - pay as you go
  - superannuation
- discuss the features and functions of common accounting reports, including:
  - balance sheet
  - business activity statements
  - chart of accounts
  - profit and loss
- outline the features and functions of common accounting software.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a printer and personal computer (PC) with appropriate specifications to run the software
- industry standard commercial accounting applications
- documents detailing business requirements
- legislative requirements if required.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT209 Interact with ICT clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide routine information and communications technology (ICT) support to clients in a professional manner.

It applies to individuals who, while working under a level of supervision, have responsibility in a frontline technical support capacity to exercise discretion and judgement using appropriate knowledge to provide assistance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Deliver support to ICT clients	1.1 Provide support for ICT clients in a courteous and professional manner according to organisational policy 1.2 Establish and confirm nature of client's ICT concerns using active listening and questioning 1.3 Maintain client contact and provide progress information until the problem is resolved
2. Respond to ICT client complaints	2.1 Respond to ICT client's concerns and issues, demonstrating a positive, sensitive and helpful attitude 2.2 Escalate and refer client concerns to support person if required, explaining the nature of issues involved 2.3 Resolve ICT client complaint using recommendations from the support person 2.4 Document and record ICT client concerns and solutions, according to organisational guidelines
3. Evaluate received ICT client complaints	3.1 Analyse recent ICT register 3.2 Propose proactive training to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1	• Evaluates textual information containing ICT specific terminology to establish proactive training needs
Writing	2.4	• Completes documentation necessary for work tasks and reporting requirements by using clear, concise and accurate grammar and language, and relevant ICT terminology
Oral Communication	1.1-1.3,2.1-2.3, 3.2	• Uses effective questioning and active listening techniques to elicit information and clarify client queries, concerns and complaints • Contributes to an effective working environment by communicating in a courteous manner and using clear, easy-to-understand and non-discriminatory language and behaviour
Navigate the world of work	1.1	• Generally follows the explicit protocols immediately related to own role
Get the work done	1.3, 2.3, 3.1	• Recognises and responds to predictable routine problems related to role in the immediate work context • Uses the main features and functions of common digital tools in everyday work contexts

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalent status
ICTICT209 Interact with ICT clients	ICAICT209A Interact with ICT clients	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT209 Interact with ICT clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- provide routine information and communications technology (ICT) client support in a professional manner
- refer client concerns to support person if required, according to escalation procedures
- resolve client complaints
- document and record client concerns and solutions according to organisational guidelines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list current industry accepted hardware and software products, and describe their general features and capabilities
- describe the ICT client business domain and business critical functions
- discuss the organisational systems and working environment
- outline organisational policies for external and internal client contact.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a personal computer
- relevant organisational guidelines
- relevant documentation
- a site where routine ICT client support may be demonstrated.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTICT210 Operate database applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to operate database applications and create and develop simple relational databases using pre-existing data.

It applies to individuals who provide administrative support working under direct supervision or with limited responsibility within a wide range of industry occupations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create database	1.1 Open a database application and design a two-table, simple relational database incorporating basic design principles 1.2 Develop a table with fields and attributes according to database usage, as well as user requirements 1.3 Create a primary key and establish an index for each table 1.4 Modify table layout and field attributes as required 1.5 Create a relationship between the two tables 1.6 Add and modify data in a table according to information requirements 1.7 Add and delete records as required 1.8 Save and close down database to storage area
2. Customise basic settings	2.1 Adjust page layout to meet user requirements 2.2 Open and view different toolbars 2.3 Format font as appropriate for the purpose of the database entries
3. Create reports	3.1 Design reports to present data in a logical sequence 3.2 Modify reports to include or exclude additional requirements 3.3 Distribute reports to appropriate person in a suitable format
4. Create forms	4.1 Use a wizard to create a simple form 4.2 Open existing database and modify records through a simple form 4.3 Rearrange objects within the form to accommodate information requirements
5. Retrieve information	5.1 Access existing database and locate required records 5.2 Create simple query and retrieve required information 5.3 Develop query with multiple criteria and retrieve required information 5.4 Select data and display appropriately

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 5.1	• Identifies and analyses a wide range of hard copy and on-line forms, reports and other end-user documentation to identify end-user needs and data
Writing	1.2, 3.1, 3.2, 4.1, 4.3, 5.2, 5.3	• Uses database related terminology and protocols when designing tables, queries, reports and forms • Uses clear plain English appropriate for end-users when labelling fields within reports and forms
Oral Communication	1.2, 3.3	• Uses simple, relevant language, effective questioning, and active listening techniques to clarify user requirements, confirm understanding and when liaising with the appropriate person
Numeracy	5.3	• Identifies and comprehends the specific numeric data needed, and uses logical functions, mathematical symbols and applies the order of operations in calculations when developing queries
Interact with others	3.3	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.1-1.8, 2.1-2.3, 3.1,3.2, 4.1-4.3, 5.1-5.4	• Plans a range of routine tasks and aims to achieve them efficiently • Takes responsibility for routine, low-impact decisions within familiar situations • Begins to identify and implement standard solutions for a number of routine problems • Understands the purpose and specific functions of common digital tools used in work contexts • Follows routine procedures for using digital technology to enter, store and retrieve information directly relevant to role

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT210 Operate database applications	ICAICT210A Operate database applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT210 Operate database applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and develop a simple database using a standard database package
- add data
- create and use a query with multiple criteria
- create and modify reports and forms.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline basic database design principles
- discuss the purposes of forms, reports and queries for retrieving and displaying information
- outline the reasons for relationships between tables (cardinality)
- describe the purpose, use and function of database software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry and include access to:

- a PC and printer
- database software currently used in industry
- documents detailing organisational style guide and policy
- documents or information containing data suitable for creating a database.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT211 Identify and use basic current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to engage in basic ongoing review and research of industry specific technologies in order to identify and apply these technologies or techniques to improve aspects of an organisation's activities.

It applies to individuals who work under minimal supervision and are responsible for ensuring that the quality of the business process is maintained at the highest level possible, through the appropriate application of industry specific technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use basic industry specific technologies	1.1 Identify technologies specific to an industry sector 1.2 Acquire and use the industry specific technologies 1.3 Identify, classify and use industry specific technologies for the benefit of the organisation
2. Use basic industry specific technologies to assist in solving organisational problems	2.1 Conduct testing of industry specific technologies 2.2 Use features and functions of industry specific technologies within an organisational context 2.3 Demonstrate depth of knowledge of enabling technologies to an accepted industry standard 2.4 Access and use sources of information relating to the industry specific technologies
3. Evaluate performance of basic industry specific technology	3.1 Evaluate industry specific technologies for performance, usability and benefit to the organisation 3.2 Determine environmental considerations involved when using the technology 3.3 Seek feedback from users where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1-1.3, 2.3, 2.4	• Investigates, evaluates and applies information from a range of complex and technical texts to expand own knowledge and identify industry specific technologies that will benefit the organisation
Reading	1.1, 1.3, 2.1, 2.4, 3.2, 3.3	• Identifies and interprets technical online and hard copy documentation containing complex terminology and diagrams to identify industry specific technologies that will benefit the organisation, and to determine environmental considerations
Oral Communication	1.1-1.3, 2.4, 3.1-3.3	• Elicits information and feedback by using effective listening and questioning techniques to identify and evaluate industry specific technologies • Uses clear, easy-to-understand language, and translates industry specific terminology into plain English where necessary
Navigate the world of work	2.3, 3.2	• Recognises organisational expectations and follows explicit protocols and procedures
Get the work done	1.1-.3, 2.1-2.4, 3.1	• Determines priorities and sequences the steps involved in clearly defined familiar tasks, and identifies and assembles the resources required • Demonstrates the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT211 Identify and use basic current industry specific technologies	ICAICT211A Identify and use basic current industry specific technologies	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT211 Identify and use basic current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify basic new and emerging industry specific technologies and techniques
- use basic features and functions of identified industry specific technologies to an industry standard.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline current technology trends and directions in information and communications technology (ICT), and specifically of the major industry technology standards used in the specified area
- outline vendor product directions
- describe current industry hardware and software products, with broad knowledge of general features and capabilities, and their application
- outline information gathering techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where industry specific technologies may be used
- industry specific technologies currently used in industry
- documents detailing work health and safety (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTICT212 Incorporate Indigenous needs and perspectives into ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify and use current information and communications technology (ICT) within Indigenous communities and to research and discuss alternative ICT solutions that meet the specific needs of Indigenous learners.

It applies to individuals who work with Indigenous people and communities under a level of supervision and use a range of specialised technical knowledge and knowledge of Indigenous learning styles and systems to provide advice.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: delivery and assessment against this unit of competency must comply with Indigenous community protocols and guidelines, and be supported by Elders or custodians of Country.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the use of ICT systems in the Indigenous community	1.1 Identify local community organisations, including Indigenous community organisations and other relevant Indigenous and related agencies, that use ICT 1.2 Determine specific Indigenous learning styles, knowledge systems and relevant legislation that impact on the use of ICT in an Indigenous community 1.3 Identify the most common communication technologies, software applications and hardware solutions used in the local community 1.4 Identify the use of ICT in local community organisations, including Indigenous community organisations and other relevant bodies
2. Identify and use specific ICT resources relevant to Indigenous people	2.1 Identify a range of methods of accessing Indigenous and non-Indigenous electronic resources for research and learning 2.2 Identify and access relevant Indigenous and ICT websites and other online resources 2.3 Following community consultation, discuss and compare the relevance of a range of Indigenous websites to Indigenous communities
3. Identify appropriate ICT resources to meet the needs of Indigenous people and communities	3.1 Use the most common local communication technologies, software applications and hardware solutions 3.2 Research and identify possible alternative communication technologies, software applications and hardware solutions 3.3 Discuss most appropriate ICT resources with local Indigenous community, to meet Indigenous individual and community needs

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.2	• Recognises and interprets both hard copy and on-line texts from both Indigenous and non-Indigenous sources to obtain information about the use of ICT in Indigenous communities
Oral Communication	1.1-1.4, 2.1-2.3, 3.2, 3.3	• Uses effective questioning and active listening techniques to elicit information • Uses specific language and applies appropriate communication skills to ensure satisfactory interactions with Indigenous community members • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information
Get the work done	1.3, 2.1, 2.2, 3.1	• Begins to identify and assemble resources required to undertake the role • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalent status
ICTICT212A Incorporate Indigenous needs and perspectives into ICT environment	ICAICT212A Incorporate Indigenous needs and perspectives into IT environment	Updated to meet Standards for Training Packages. Minor edits to title and clarify intent of performance criteria.	Equivalent unit

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Assessment Requirements for ICTICT212 Incorporate Indigenous needs and perspectives into ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify common communication technologies, software applications and hardware solutions used in the local Indigenous community
- identify specific Indigenous customs and practices that impact on the use of information and communications technology (ICT) within the community
- use current communication technologies, software applications and hardware solutions
- consult with relevant Indigenous community members and develop alternative ICT solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a summary of operating system, hardware and software products
- discuss ergonomic principles to avoid back, wrist and eye strain
- discuss work health and safety (WHS) principles and responsibilities relating to ICT specific to Indigenous community customs and practices
- identify important indigenous cultural communications attributes.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a PC
- relevant hardware components
- WHS standards and organisational policies and procedures
- relevant software applications
- common communication technologies.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT301 Create user documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create user documentation that is clear to the target audience and easy to navigate.

It applies to individuals who may work under supervision with responsibility to support others in a range of information and communications technology (ICT) areas.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine documentation standards and requirements	1.1 Determine documentation requirements 1.2 Investigate documentation and industry standards for requirements, and determine appropriate application to user documentation 1.3 Design documentation templates using appropriate software and obtain approval from appropriate person
2. Produce user documentation	2.1 Conduct a review of the subject system, program, network or application in order to understand its functionality 2.2 Gather existing technical, design or user specifications and supporting documentation 2.3 Create user documentation based on the template to record the operation of the subject system, program, network or application
3. Review and obtain sign-off	3.1 Submit user documentation to target audience for review 3.2 Gather and analyse feedback 3.3 Make changes to user documentation 3.4 Submit user documentation to appropriate person for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.2	• Identifies and interprets textual, numeric and diagrammatic information with ICT specific syntax, terminology and formatting to determine and understand job requirements
Writing	1.3, 2.3, 3.3	• Uses correct spelling, grammar and plain English together with the ICT specific terminology in the required format, incorporating, diagrams, icons and syntax related to the subject matter
Oral Communication	1.1, 1.2, 2.1, 3.1, 3.2, 3.4	• Elicits and evaluates information using effective listening and questioning techniques • Uses simple and relevant language to confirm understanding of requirements, identify the audience, present information and obtain feedback
Navigate the world of work	1.2	• Takes some personal responsibility for adherence to legal and regulatory requirements
Get the work done	1.1, 1.3, 2.1, 2.2	• Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Plans routine tasks with familiar goals and outcomes, taking some limited responsibility for decisions regarding sequencing and timing

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT301 Create user documentation	ICAICT301A Create user documentation	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT301 Create user documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce user documentation that:
  - meets business requirements
  - caters for a diverse audience
  - is clear and easy to navigate.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify content features, including clarity and readability
- discuss document design, web design and usability
- list the functions and features of templates and style guides.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry and include access to:

- documentation standards
- software tools for creating documentation
- information about the system, platform, network or application being documented.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT302 Install and optimise operating system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit defines the skills and knowledge required to install, configure and optimise operating system (OS) software to meet business and client needs.

It applies to individuals who may work under supervision and support others using well developed skills in creating solutions through analysis and evaluation of information.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine function of operating system	1.1 Identify and demonstrate understanding of the purposes of operating system 1.2 Distinguish between batch system, real-time system and multi-tasking system 1.3 Compare and contrast different operating systems and their features 1.4 Identify and demonstrate knowledge of the basic functions of operating system, including file system, memory management, process scheduling 1.5 Identify and demonstrate management of virtual memory
2. Obtain operating system	2.1 Contact operating system vendors to obtain technical specifications and system requirements 2.2 Identify process and steps required to install and configure the operating system using installation components 2.3 Document adjustment recommendations and provide to appropriate person 2.4 Determine and apply knowledge of licensing, hardware and security requirements
3. Install, configure and optimise operating system	3.1 Install, configure and test operating system using installation components and boot-utility options 3.2 Use the relevant operating system user interface to correctly configure the installation 3.3 Optimise the system to meet organisational requirements 3.4 Document the system according to organisational requirements 3.5 Install the operating system with minimal disruption to client or users
4. Provide instruction to meet new software requirements	4.1 Provide one-to-one instruction about changes to the client or users as required 4.2 Obtain client evaluation about new system to ensure requirements are met, using appropriate feedback mechanism

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3-1.5, 2.1, 2.2, 2.4, 3.1, 3.2, 4.2	• Identifies, analyses and evaluates a range of on-line and hard-copy text containing complex, OS specific terminology, and applies the information to the selection, installation, configuration and optimisation of operating systems • Interprets and comprehends a large range of syntax, diagrams, icons, symbols, text, numbers and letters necessary to install and configure operating systems
Writing	2.3, 3.4	• Uses the correct spelling and grammar, clear plain English and systems related text to document recommendations and processes, and develop feedback tools
Oral Communication	2.1, 3.5, 4.1, 4.2	• Elicits and evaluates information using OS related terminology and effective listening and questioning techniques • Uses simple and relevant language to liaise with clients, present information and obtain feedback
Navigate the world of work	2.4	• Takes some personal responsibility for adherence to legal and regulatory requirements, and seeks clarification when required
Get the work done	1.1-1.5, 2.1, 2.2, 3.1-3.3, 3.5	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT302 Install and optimise operating system software	ICAICT302 Install and optimise operating system software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT302 Install and optimise operating system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install, configure and test an operating system to improve system performance with minimum disruption to clients.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare current industry accepted hardware and software products
- outline functions and features of operating systems used by the organisation
- explain the installation and configuration of systems software
- explain the architecture of current technical systems
- outline the deployment of current organisational systems
- list organisational requirements for operating system (OS) software
- explain prerequisites for system software installation
- outline set-up and configuration procedures
- list software packages supported by the organisation
- describe system's current functionality
- list system's diagnostic software
- outline vendor specifications and requirements for installation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer where installation may be performed
- OS software and technical documentation
- organisational documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT303 Connect internal hardware components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to acquire, install, configure and evaluate system hardware components according to client and user requirements.

It applies to individuals who work with a degree of self-sufficiency and provide support in a range of information and communications technology (ICT) work areas and activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify, categorise and distinguish between the different types of internal hardware components	1.1 Identify and categorise the different internal hardware components 1.2 Define the purpose and characteristics of the different internal hardware component categories 1.3 Distinguish between different types of devices within each internal hardware component category
2. Determine components required	2.1 Identify and clarify user internal hardware component requirements according to organisational guidelines 2.2 Organise and record user component requirements, pass on to appropriate person for evaluation and vendor selection
3. Obtain components	3.1 Contact vendors to obtain technical specifications for the proposed components 3.2 Assess options and provide recommendations to the appropriate person for final analysis 3.3 Obtain components to prepare for installation
4. Install components	4.1 Develop plans, with prioritised tasks and contingency arrangements, for the installation of selected components with minimum disruption to clients 4.2 Liaise with appropriate person to obtain approval for the plans 4.3 Install and configure components according to plan, installation procedures and organisational requirements 4.4 Test components for error-free performance, using available technology 4.5 Identify and resolve identified problems 4.6 Test and enhance system performance, using knowledge of the system, to meet organisational benchmarks 4.7 Document the installation and configuration process according to organisation guidelines
5. Evaluate modified system	5.1 Collect client or user feedback and analyse against client requirements 5.2 Correct identified shortcomings in the system and record

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ELEMENT	PERFORMANCE CRITERIA
	actions

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 3.2, 4.3, 5.1	• Identifies, interprets and evaluates online and hard copy documentation containing complex ICT related terminology, acronyms and concepts
Writing	2.2, 3.2, 4.1, 4.7	• Uses correct spelling, grammar and plain English together with the ICT specific terminology and diagrams to convey recommendations and requirements, and complete organisational documentation
Oral Communication	1.1, 2.2, 3.1-3.3, 4.1, 4.2, 5.1	• Converts highly technical language and terminology into plain English to communicate ideas and plans, and gather feedback from clients • Uses effective listening and questioning techniques and technical terminology to elicit information and make the correct component selection
Navigate the world of work	2.1, 4.3	• Recognises and follows explicit protocols and meets expectations associated with own role
Get the work done	1.1, 1.3, 2.1, 2.2, 3.2, 3.3, 4.1, 4.4-4.6, 5.1, 5.2	• Initiates standard procedures when responding to familiar problems within immediate context • Recognises some general design and operating principles of digital tools and uses these to help when modifying systems and when troubleshooting • Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT303 Connect internal hardware components	ICAICT303A Connect internal hardware components	Updated to meet Standards for Training Packages. Minor edits to clarify intent of performance criteria.	Equivalent unit

Links

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Assessment Requirements for ICTICT303 Connect internal hardware components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and categorise the different types of internal hardware components
- modify system's hardware to meet client requirements
- plan modification of and connect internal hardware components according to vendor and technical specifications
- install components across a variety of situations and account for unexpected contingencies
- evaluate the system on completion.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe areas of the operating system relevant to configuration and testing
- compare current industry accepted hardware and software products
- outline environmental considerations in e-waste disposal
- outline organisational guidelines and organisational requirements with regard to safety, recycling and component installation
- outline system's diagnostic software and current functionality
- interpret vendor specifications and requirements for component installation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer and internal hardware components for installation
- current industry standard performance testing software
- documents detailing organisational guidelines and requirements
- technical manuals and tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTICT304 Implement system software changes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement system software changes and to hand over the modified system to the client's operational area.

It applies to individuals working in support roles who are required to update operating systems on client computers with the latest technology fixes, working under minimum supervision.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine system changes required	1.1 Determine and record required changes to system 1.2 Ensure documentary evidence exists to support changes and evaluate changes required 1.3 Complete documentation required according to maintenance methodologies 1.4 Clarify and confirm nature of the changes with the client 1.5 Obtain technical data from reliable sources and request other resources that may be required to complete the changes
2. Carry out system changes	2.1 Plan the procedure to effect intended changes 2.2 Consult with colleagues and users involved in the proposed changes and agree a mutually acceptable timeline and method of implementation 2.3 Copy initialisation or configuration files prior to implementation 2.4 Create a roll-back path in the event of failure 2.5 Ensure changes required in software are made according to project or organisational guidelines 2.6 Test and verify that the changes have been made according to implementation guides and organisational standards
3. Present changes to client	3.1 Demonstrate changes to the client and explain the impact of these changes 3.2 Work towards making these changes acceptable to the client if changes are rejected, or making further modifications if required 3.3 Update documentation and repositories according to standards and update modifications made to the change management system
4. Perform handover to client	4.1 Update documentation and client procedures to reflect changes made 4.2 Secure sign-off of acceptance documents by client 4.3 Facilitate handover of modified system to client's operational area

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.5	• Identifies and interprets hard copy, online and computer generated text, numerical and diagrammatic information with systems software specific terminology • Reviews a range of organisational documentation to identify relevant information relating to the requirements of both the job role and organisation
Writing	1.1, 1.3, 3.3, 4.1	• Uses correct spelling and grammar, plain English and, when necessary, systems related text and terminology to complete documentation and update client procedures
Oral Communication	1.1, 1.2, 1.4, 1.5, 2.1, 2.2, 3.1, 3.2, 4.2, 4.3	• Uses effective listening and questioning techniques and systems related terminology to elicit information about the systems and determine the job requirements • Converts highly technical language and terminology to plain English to communicate changes to, and gather feedback from, the client(s)
Navigate the world of work	2.5, 2.6, 3.3	• Recognises and follows explicit protocols and meets expectations associated with own role
Get the work done	1.1, 2.1-2.4, 2.6, 3.2, 3.3, 4.3	• Initiates standard procedures when responding to familiar problems within immediate context • Recognises some general design and operating principles of digital tools and uses these to help when modifying systems and when troubleshooting • Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT304 Implement system software changes	ICAICT304A Implement system software changes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT304 Implement system software changes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate, document and implement changes to the system with minimum disruption to the system and client users
- hand over the project to the client with instructions and updated documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe business scheduling requirements
- identify change control procedures
- describe client business domain
- discuss current industry accepted hardware and software products
- discuss emerging standards for data and voice communications
- outline the system's current functionality
- discuss the features of the system under modification
- outline the organisational policy and procedures with regard to system changes
- recognise vendor software services with regard to system changes.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a computer
- system software currently used in industry
- technical manuals and tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT305 Identify and use current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, research and apply industry specific technologies to ensure that the quality of the entire business process is maintained at the highest level possible.

It applies to individuals who work under minimal supervision and support information technology activities in the workplace across a wide range of information and communications technology (ICT) areas, including technical support, network administration, web technologies, software applications and digital media technologies.

Check the Implementation Guide Companion Volume for details about licensing, legislative or certification requirements.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use industry specific technologies	1.1 Identify technologies specific to an industry sector 1.2 Acquire and use the industry specific technologies 1.3 Identify, classify and use industry specific technologies where appropriate for the benefit of the organisation
2. Use industry specific technology to assist in solving organisational problems	2.1 Conduct testing of industry specific technology 2.2 Use features and functions of industry specific technology within an organisational context 2.3 Demonstrate depth of knowledge of the enabling technologies to an accepted industry standard 2.4 Access and use sources of information relating to the industry specific technology
3. Evaluate industry specific technology performance	3.1 Evaluate industry specific technology for performance, usability and benefit to the organisation 3.2 Determine environmental considerations involved with using the technology 3.3 Seek feedback from users, where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1-1.3, 2.3, 2.4	• Investigates, evaluates and applies information from a range of complex and technical texts to expand own knowledge and identify industry specific technologies that will benefit the organisation
Reading	1.1, 1.3, 2.1, 2.4, 3.2, 3.3	• Identifies and interprets technical online and hard copy documentation containing complex terminology and diagrams to identify industry specific technologies that will benefit the organisation, and to determine environmental considerations
Oral Communication	1.1-1.3, 2.4, 3.1-3.3	• Elicits information and feedback by using effective listening and questioning techniques to identify and evaluate industry specific technologies • Uses clear, easy-to-understand language, translating industry specific terminology into plain English when talking to users and when necessary
Navigate the world of work	3.2	• Takes personal responsibility for adherence to legal and regulatory responsibilities relevant to own work context
Get the work done	1.1-1.3, 2.1-2.3, 3.1	• Recognises some general design and operating principles of digital tools • Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency • Initiates standard procedures when responding to familiar problems within immediate context

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT305 Identify and use current industry specific technologies	ICAICT305A Identify and use current industry specific technologies	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT305 Identify and use current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify new and emerging industry specific technologies
- use features and functions of identified industry specific technologies to an industry standard level
- evaluate the performance and usability of the technology.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss current technology trends and directions in information and communications technology (ICT) and specifically the major industry technology standards used in the specified ICT area
- describe vendor product directions relating to the specified ICT area
- describe the general features, capabilities and application of current industry hardware and software products
- outline information gathering techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where industry specific technologies may be used
- industry specific technologies currently used in industry
- documents detailing work health and safety (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT306 Migrate to new technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research, acquire, evaluate and apply new technology to improve the organisation's performance.

This unit applies to individuals who have achieved a degree of autonomy as information and communications technology (ICT) users and support staff engaged in ongoing review and research to identify and apply new technology or techniques to improve aspects of the organisation's activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use new technology	1.1 Review organisation's goals and activities 1.2 Research new operational technologies that will advance the organisation's goals and activities 1.3 Prepare evaluation checklist 1.4 Evaluate and select the most appropriate technologies 1.5 Acquire selected technology 1.6 Identify and use new or upgraded equipment where appropriate for the benefit of the organisation
2. Use technology to assist in solving organisational problems	2.1 Conduct testing of new or upgraded equipment 2.2 Use features and functions of new or upgraded equipment and software within the organisation 2.3 Access and use sources of information relating to new or upgraded equipment
3. Evaluate new or upgraded technology performance	3.1 Evaluate new or upgraded equipment for performance and usability against work health and safety (WHS) standards and evaluation criteria 3.2 Determine environmental considerations for new or upgraded equipment 3.3 Seek feedback from users, where appropriate 3.4 Document new technology in a method consistent with organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1, 1.3, 1.4, 2.3	• Investigates, evaluates and applies information from a range of complex and technical texts to expand own knowledge and identify new technologies that will benefit the organisation
Reading	1.2, 1.4, 2.3, 3.1-3.3	• Identifies and interprets technical online and hard copy documentation containing complex terminology and diagrams to identify new technologies that will benefit the organisation, and to determine organisational, WHS and environmental considerations
Writing	1.3, 3.3, 3.4	• Uses appropriate language and document structure to clarify evaluation criteria and enhance objectivity when developing checklists • Uses correct grammar, sentence structure and, as much as possible, plain English in all documentation developed • Uses appropriate questioning strategies, avoiding loaded or leading questions, when developing feedback gathering documentation
Oral Communication	1.1, 1.2, 1.4, 2.3, 3.3	• Elicits information and feedback by using effective listening and questioning techniques, and language appropriate to the audience and subject matter to identify and evaluate new technologies • Uses clear, easy-to-understand language, translating technical terminology into plain English when talking to users
Navigate the world of work	3.1	• Appreciates the implications of legal and regulatory responsibilities related to own work and is beginning to recognise some general legal principles across work contexts
Get the work done	1.3, 1.4-1.6, 2.1, 2.2, 3.2	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for efficiency • Understands the purposes, specific functions and key features of common digital systems and tools • Tests and operates common digital tools and systems to effectively complete routine tasks • Takes responsibility for the outcomes of routine

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		decisions related directly to own role

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT306 Migrate to new technology	ICAICT306A Migrate to new technology	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTICT306 Migrate to new technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify new and emerging technology in information and communications technology (ICT)
- test and evaluate new equipment for the benefit of the organisation
- use features and functions of new technologies, including software and equipment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss current technology trends and directions in ICT including:
  - hardware
  - new developments
  - new protocols
  - services
  - software
- describe the general features and capabilities of current industry hardware and software products
- outline information gathering techniques
- outline vendor product directions relating to specified technology.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where new technology may be used
- new equipment and software currently used in industry
- documents detailing work health and safely (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT307 Customise packaged software applications for clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse, design, implement and review the customisation of packaged software applications, using simple programming constructs.

It applies to individuals who have achieved a degree of autonomy as information and communications technology (ICT) users and support personnel for software application activities in the workplace.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse customisation requirements	1.1 Determine and document client requirements in a requirement specifications file in line with organisational requirements and security requirements 1.2 Confirm that projected specifications meet client requirements 1.3 Determine level of documentation necessary to meet client requirements
2. Develop customisation	2.1 Design software applications, taking into account system limitations and client needs 2.2 Customise software applications using simple programming constructs, conforming to organisational requirements 2.3 Obtain feedback from the client following client testing of the customised software applications 2.4 Make further changes to software applications to meet client requirements 2.5 Document the changes
3. Provide support for customised application	3.1 Produce documentation for client 3.2 Produce help desk documentation for ongoing support 3.3 Obtain clients' evaluation and feedback to ensure that their requirements have been met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.2, 3.3	• Identifies and interprets a variety of hard copy and online technical information to identify organisational requirements and clarify client requirements
Writing	1.1, 1.3, 2.1, 2.2, 2.4, 2.5, 3.1, 3.2	• Uses correct spelling and grammar, plain English and specific terminology to produce documents to organisational guidelines as required by the job role • Uses the appropriate programming syntax and conventions to perform job role
Oral Communication	1.1-1.3, 2.3, 3.3	• Elicits and evaluates information using effective listening and questioning techniques • Uses simple and relevant language to confirm understanding of requirements, liaise with the client and obtain feedback
Get the work done	1.1, 1.3, 2.1-2.4	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for efficiency • Understands the purposes, specific functions and key features of common digital systems and tools • Tests and operates common digital tools and systems to effectively complete routine tasks • Takes responsibility for the outcomes of routine decisions related directly to own role

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT307 Customise packaged software applications for clients	ICAICT307A Customise packaged software applications for clients	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT307 Customise packaged software applications for clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret and document client requirements to customise software applications
- design software applications
- analyse, implement and review customised software applications
- produce documentation for the client
- obtain feedback from client to ensure requirements have been met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the general features and capabilities of current industry accepted hardware and software products
- discuss functions and features of software applications suitable for client
- discuss functions and features of the operating system (OS)
- identify information and communications technology (ICT) structure and system infrastructure
- describe organisational policy and procedures relating to customising software
- identify organisational security procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where software applications may be customised
- use of customisable software applications currently used in industry
- client requirements documentation
- organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT308 Use advanced features of computer applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use computer applications employing advanced features. It involves manipulating data and accessing support resources to solve routine problems.

It applies to individuals who have achieved a degree of autonomy as advanced information and communications technology (ICT) users, and support information technology activities in software applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manipulate data	1.1 Employ advanced features of applications in the preparation and presentation of data 1.2 Transfer data between applications, linking and embedding related data files as required 1.3 Create and employ objects, macros and templates for routine activities 1.4 Use shortcuts and features to increase personal productivity
2. Access and use support resources	2.1 Solve routine problems using support resources 2.2 Use online help to overcome difficulties with applications 2.3 Solve problems with manuals and training booklets 2.4 Access and apply technical support for system problems, using troubleshooting results and alert messages

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1-2.4	• Identifies and interprets a variety of hard copy, online and software generated technical information containing software specific language, syntax and code to apply features and functions of applications to their fullest extent and to solve problems
Oral Communication	2.1, 2.4	• Discusses and resolves problems using technical terms and language, and effective listening and questioning techniques
Get the work done	1.1-1.4, 2.1-2.4	• Understands key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT308 Use advanced features of computer applications	ICAICT308A Use advanced features of computer applications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT308 Use advanced features of computer applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use at least three computer applications employing advanced features and import and export capacities for efficiency and productivity purposes
- solve routine problems using support resources.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the basic features and functions of relevant operating systems software and system tools
- outline relevant vendor product directions in computer applications
- identify commonly available vendor applications and their features.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a site where advanced features of computer applications may be used
- computer applications currently used in industry
- documents or information containing data suitable to demonstrate advanced features of computer applications
- support resources, including online, manuals and training booklets.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT401 Determine and confirm client business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine client business system requirements and verify the accuracy of the information gathered.

It applies to information and communications technology (ICT) personnel who are required to analyse client expectations and needs, and recommend business system changes.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine context of business need or problem	1.1 Establish the business problem to be investigated, including determining system boundaries, scope and the development methodology to be used 1.2 Choose information gathering method and develop questions appropriate to business problem 1.3 Develop objectives and identify expected outcomes to be achieved 1.4 Document the business problem 1.5 Submit documentation to appropriate person for substantiation
2. Gather information	2.1 Use chosen information gathering method to identify clients of the system and problems they encounter 2.2 Record client responses 2.3 Analyse gathered information to identify new system requirements and establish problem specifications 2.4 Document system requirements and problems 2.5 Analyse physical requirements and identify changes required to implement new systems
3. Confirm system specifications	3.1 Check documentation to ensure it meets client business needs 3.2 Submit documentation to the client for verification of accuracy and approval 3.3 Make changes to the documentation as necessary and indicated by the client 3.4 Submit documentation to client for final approval or sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.3, 2.5, 3.1	• Identifies, analyses and evaluates information from a variety of sources containing complex systems related terminology to determine system performance requirements and establish solutions
Writing	1.2-1.4, 2.2, 2.4, 3.3	• Uses the correct spelling and grammar, plain English and, when necessary, systems related text and terminology to develop information gathering tools and document recommendations
Oral Communication	1.1, 2.1, 2.5, 3.2, 3.4	• Uses plain English, effective listening and questioning techniques and, where necessary, systems related terminology to elicit information • Uses plain English and relevant terminology to liaise with clients, present information and obtain feedback
Get the work done	1.1-1.3, 2.1, 2.3, 2.5	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements so work is undertaken methodically • Recognises and takes responsibility for addressing predictable and some less predictable problems in familiar work contexts • Understands the purposes, specific functions and key features of common digital systems and tools to provide current advice on systems and data gathering products

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT401 Determine and confirm client business requirements	ICAICT401A Determine and confirm client business requirements	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT401 Determine and confirm client business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use investigative techniques to obtain information and document the business system problem
- produce a clear statement of business expectations and needs, including critical business requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe a variety of data gathering techniques
- describe areas related to the client business in detail
- interpret functional organisational charts
- outline physical requirements of the client's business, taking into account current system functionality, geography, environment, client user and cost constraints
- describe products related to data capture
- discuss the role of stakeholders and the degree of stakeholder involvement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- current business needs
- a client expectations brief
- business objectives
- systems, data gathering and appropriate software products.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT402 Determine project specifications and secure client agreement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop agreed acceptance criteria for information and communications technology (ICT) projects.

It applies to individuals who are competent in a wide range of general ICT technologies and support small to medium enterprises (SMEs) that require broader rather than more specialised ICT support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine milestones and quality attributes with client	1.1 Interview client to determine project deliverables and acceptance criteria 1.2 Document project milestones and associated deliverables in measurable terms, taking into account constraints 1.3 Determine and document criteria to evaluate each deliverable 1.4 Negotiate and document quality standards with client 1.5 Confirm project direction with appropriate person
2. Formulate metrics and milestones	2.1 Define the units of measurement (metrics) that will be used in the project, including consideration of project milestones, timeframe and costs 2.2 Schedule the measurement of project milestones and associated deliverables 2.3 Document the process for analysing variances and their impact on the project 2.4 Schedule quality reviews into project plan
3. Obtain client agreement to acceptance criteria	3.1 Obtain client agreement for project delivery dates 3.2 Communicate acceptance criteria clearly and coherently to the client 3.3 Obtain client agreement to acceptance criteria and anticipated timeframes for the project

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.2-1.4, 2.2-2.4	• Uses plain English; appropriate grammatical structures and specialised terminology; diagrams and flow charts; logical document structures and formatting relevant to the job role and organisation to record project deliverables and benchmarks • Enters text, data and financial information into project planning tools to produce output for the project plan that is appropriate to the audience
Oral Communication	1.1, 1.4, 1.5, 3.1-3.3	• Uses open questioning and effective listening techniques to elicit information, clarify requirements and conduct effective negotiations • Uses appropriate vocabulary, grammatical structure, voice tone, body language and reflective responses to negotiate deliverables, present project plan and gain consensus
Numeracy	1.1-1.4, 2.1-2.3	• Applies mathematical calculations and financial functions relating to timelines and project budgets
Interact with Others	1.1, 1.4, 1.5, 3.1-3.3	• Identifies and takes steps to follow accepted communication practices and protocols • Uses a limited range of accepted practices for communicating in a work environment
Get the work done	1.1-1.3, 1.5, 2.1, 2.2, 2.4	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to identify relevant information, including strategic initiatives and resources • Considers purpose, needs and limitations when selecting digital devices and applications for different tasks • Uses digital technology for basic reading, recording and searching information, and for communications following routine procedures and security requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT402 Determine project specifications and secure client agreement	ICAICT402A Determine project specifications and secure client agreement	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTICT402 Determine project specifications and secure client agreement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop acceptance criteria for a project
- document acceptance criteria according to organisational standards
- present the document to stakeholders and obtain approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business area
- outline project planning methodologies and tools
- identify and apply quality processes
- interpret system development plans
- identify technical tools and their use relating to task list when formulating metrics and milestones
- explain the theory and purpose of metrics.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- client requirements
- technical specifications
- organisational and process goals
- critical business requirements
- predefined high-level acceptance criteria
- project deliverables
- future organisational business processes test plan
- project budget timeframe.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT403 Apply software development methodologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply traditional and non-traditional systems development methodologies.

It applies to individuals in a senior development role who exercise discretion and judgement to create solutions using appropriate technical knowledge and analysis skills.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine and select appropriate methodology for a given activity	1.1 Determine and define subject activity 1.2 Define criteria for selection of development methodology 1.3 Review and evaluate a range of traditional and non-traditional system development methodologies 1.4 Select appropriate system development methodology to suit the activity
2. Apply the selected development methodology	2.1 Create an initial project plan to guide developmental processes 2.2 Identify appropriate task types according to development methodology 2.3 Clearly describe and articulate task types 2.4 Define appropriate control structures that need to be created during task type execution 2.5 Associate each task type with a set of input and output parameters
3. Adjust project to suit appropriate methodology	3.1 Identify resources to support methodology selection 3.2 Apply appropriate methodology to solve tasks 3.3 Monitor project flow and record effectiveness against project plan 3.4 Review and document opportunities for improvement, lessons learned and recommendations for future projects 3.5 Submit results to appropriate person for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 3.1, 3.4	• Identifies, analyses and evaluates a range of textual information containing complex systems development specific terminology, syntax and diagrams, and applies the information to the task
Writing	2.1, 2.3, 3.3, 3.4	• Uses the correct spelling and grammar, and technical terminology to develop project plans, document recommendations, processes and reports in a format suitable to the audience
Oral Communication	1.1, 1.3, 2.3, 3.1-3.4	• Elicits and evaluates information using project related terminology and effective listening and questioning techniques • Uses plain English and, where necessary, project related terminology to liaise with clients, present information and obtain feedback • Uses specific and complex systems development terminology to liaise with co-workers
Get the work done	1.1-1.4, 2.2, 2.4, 2.5, 3.1-3.4	• Uses familiar digital systems and tools to access, organise, analyse and display information relevant to the role • Applies formal processes when planning more complex tasks, producing plans with logically sequenced steps, reflecting an awareness of time and resource constraints and the needs of others • Reflects on the appropriateness and effectiveness of project methodologies and identifies some key principles that may be relevant in future situations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT403 Apply software development methodologies	ICAICT403A Apply software development methodologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT403 Apply software development methodologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a project plan
- apply a methodology to a project
- produce documentation as required by the chosen methodology.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe client business domain and organisational requirements
- explain current project requirements
- explain role of stakeholders and the degree of stakeholder involvement in the development process
- describe at least two current system development methodologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- design specifications and current methodologies
- organisational standards for documentation and version control
- detailed user requirements document, including model and scope.

Assessors must satisfy NVR/AQTF assessor requirements.

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Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT404 Use online learning tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use the internet as a resource to acquire knowledge and skills to meet client requirements.

It applies to individuals who use the internet to maintain currency of workplace skills.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify learning requirements	1.1 Identify learning requirements and skill gaps 1.2 Seek advice from relevant personnel on learning requirements and skill gaps 1.3 Identify opportunities for undertaking learning development activities 1.4 Develop learning plan
2. Research learning tools available online	2.1 Identify existing online learning tools 2.2 Research and evaluate other relevant online learning tools
3. Undertake learning	3.1 Implement learning plan 3.2 Identify opportunities in the workplace to apply new learning 3.3 Follow coaching or mentoring advice in work activities
4. Monitor learning effectiveness	4.1 Determine suitable assessment mode 4.2 Review outcomes of assessment 4.3 Undertake peer assessment 4.4 Assess feedback from peer assessment, individuals and colleagues 4.5 Identify further learning requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1, 1.2, 1.4, 3.1, 3.3, 4.3	• Identifies future skills and knowledge needs by seeking the opinions of others • Investigates and evaluates information from a range of sources to select learning development activities to meet skills gaps and future learning needs • Uses a range of learning mediums, including coaching, mentoring, online and peer-to-peer to manage the learning process, and ensures learning is reinforced by application
Reading	1.1, 1.3, 2.1, 2.2, 3.2, 4.1, 4.2, 4.4, 4.5	• Identifies, analyses and compares information gathered from a large range of both online and hard copy texts to determine current and future learning needs, and to develop and execute a learning plan
Writing	1.4, 2.2, 3.1, 4.3	• Uses appropriate and clear language, including clear referencing and web links, to document findings, develop a learning plan, undertake assessment and complete learning
Oral Communication	1.2, 3.3, 4.3, 4.4	• Elicits and evaluates information using effective listening and questioning techniques to identify skills gaps and future skills needs, and undertake the learning, assessment and feedback process
Interact with Others	1.2, 3.3, 4.3 4.4	• Selects and uses appropriate conventions and protocols when communicating with clients and co-workers in a range of work contexts • Uses a range of strategies to establish a sense of connection and build rapport with clients and co-workers • Cooperates with others and contributes to work practices where joint outcomes are expected and deadlines are to be met
Get the work done	2.1, 3.1, 3.2, 4.1, 4.2	• Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Takes responsibility for defining key aspects of own workload and managing own learning related activities • Reflects on the appropriateness and effectiveness of assessment outcomes and identifies some key

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		principles that may be relevant in future situations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT404 Use online learning tools	ICAICT404A Use online learning tools	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT404 Use online learning tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify current and future skills needs
- develop and implement learning plan and assessment
- use online learning tools to acquire knowledge and skills to meet client requirements
- maintain currency of skills within the workplace.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the current and future industry trends
- identify and describe relevant legislation and statutory requirements
- describe organisational training policies, plans and procedures
- identify and apply a range of online training tools
- explain the principles and techniques of measuring performance and self-assessment
- identify methods to recognise and prioritise required learning needs
- describe the systems and processes used to direct learning
- identify relevant competency standards and assessment relative to learning needs.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to the internet to use online learning tools.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT405 Develop detailed technical design

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to assist in the development of a detailed technical design.

It applies to individuals performing systems design tasks who are required to review and update technical design documents.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assist in selecting technical design features	1.1 Select and revise design model based on iteration and design changes 1.2 Incorporate outstanding design points according to acceptance criteria 1.3 Distribute reports identifying changes and implications to appropriate person for review
2. Contribute to design review	2.1 Compare design against requirements and fix as necessary 2.2 Confirm design with appropriate person 2.3 Use feedback mechanisms to gather information on design changes from client 2.4 Incorporate design changes where required
3. Contribute to development of program specifications	3.1 Implement modules by incremental development techniques 3.2 Identify user authority for each module 3.3 Prepare detailed specifications of module implementation for each module that will not be incrementally built 3.4 Prepare documentation according to requirements of the project

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.3	• Identifies, analyses and evaluates a range of online and hard copy text containing complex systems design terminology, syntax and diagrams, and applies the information to the task
Writing	1.1, 1.2, 2.3, 2.4, 3.3, 3.4	• Uses correct spelling and grammar, plain English, systems design related terminology and diagrams to obtain feedback, document recommendations and prepare final project specifications
Oral Communication	1.1, 1.3, 2.2, 2.3	• Elicits and evaluates information using project related terminology and effective listening and questioning techniques • Uses plain English and, where necessary, project related terminology to liaise with clients, present information and obtain feedback
Interact with Others	1.3, 2.2, 2.3	• Selects and uses appropriate conventions and protocols when communicating with clients and co-workers in a range of work contexts • Uses a range of strategies to establish a sense of connection and build rapport with clients and co workers
Get the work done	1.1-1.3, 2.1, 2.4, 3.1-3.3	• Uses familiar digital systems and tools to incorporate required changes to model • Applies formal processes when developing strategic initiatives, and plans tasks with logically sequenced steps • Initiates standard procedures when responding to familiar problems within immediate context • Uses familiar digital technologies and systems to access information, search and enter data and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT405 Develop detailed technical design	ICAICT405A Develop detailed technical design	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT405 Develop detailed technical design

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define the client business domain and client's critical business functions and processes
- design and prepare a clear and best-fit technical design for a set project, incorporating:
  - changes to design model based on user requirements
  - detailed specification of modules
- produce updated documentation to reflect changes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain various life cycle options
- describe design fundamentals and refinement
- discuss design quality metrics.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- requirements model
- business requirements
- project deliverables
- acceptance criteria
- current ICT blueprint.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT406 Build a graphical user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, build and test a graphical user interface (GUI) to specification.

It applies to individuals employed as programmers in a variety of fields who provide information and communications technology (ICT) support in small to medium enterprises (SMEs).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine specification of GUI	1.1 Review GUI requirements 1.2 Review organisational standards for GUI 1.3 Determine the back-end for interfacing with the GUI 1.4 Determine the functionality of the GUI, including back-end interface 1.5 Determine the application development language for writing the GUI 1.6 Determine type and level of documentation required
2. Design GUI to specification	2.1 Design the GUI incorporating the required functionality 2.2 Document design outcomes
3. Build GUI to specification	3.1 Build the GUI with the required functionality in the determined language, using the toolkit's classes or widgets, containers and other pertinent features
4. Test and document GUI to meet specification	4.1 Test GUI for overall functionality according to requirements 4.2 Iterate GUI design or build until test results meet requirements 4.3 Produce technical documentation for the GUI

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 1.6	• Identifies and interprets a range of online and hard copy text containing complex ICT and programming specific terminology • Interprets and comprehends a large range of syntax, diagrams, icons, symbols, text, numbers and letters necessary to develop a GUI
Writing	2.1, 2.2, 3.1, 4.2, 4.3	• Uses correct spelling and grammar, plain English and specific terminology to produce documents to organisational guidelines as required by the job role • Uses the appropriate programming syntax and conventions to develop the GUI • Uses plain English, clear labels and terminology appropriate for the user on the actual interface display
Oral Communication	1.1-1.4, 1.6	• Elicits and evaluates information using effective listening and questioning techniques • Uses simple and relevant language to confirm understanding of requirements
Navigate the world of work	1.2	• Recognises and follows explicit protocols and meets expectations associated with own role
Get the work done	1.1, 1.3-1.6, 2.1, 3.1	• Develops plans to manage relatively complex tasks with an awareness of how they may contribute to longer term operational and strategic goals • Recognises and anticipates an increasing range of familiar problems, their symptoms and causes, and implements contingency plans • Takes responsibility for the outcomes of routine decisions related directly to own role • Considers purpose, needs and limitations when selecting devices and applications for different tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT406 Build a graphical user interface	ICAICT406A Build a graphical user interface	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT406 Build a graphical user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- build a graphical user interface (GUI) to requirements
- demonstrate a GUI in concept and compiled form, using appropriate development tools to assist GUI construction
- develop appropriate documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain and apply object oriented programming concepts
- identify the system properties
- describe the features of application programming interface (API)
- identify the issues relating to copyright and intellectual property
- discuss code of practice relevant to the computer industry
- discuss the Commonwealth and State privacy and information access legislation applicable to the job role.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- GUI requirements
- organisational standards
- a development environment.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT407 Maintain website information standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to publish new content and establish and maintain the accuracy and usability of current content on client websites. It applies to individuals working in the web area who provide support in small to medium enterprises (SMEs).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare and publish organisational content and information required by industry for website	1.1 Validate organisational information and seek approval prior to uploading to a website 1.2 Ensure specific details of the organisation are made available on the website 1.3 Ensure privacy, security and liability statements are correctly displayed on the website and conform to legislative requirements and web development standards 1.4 Develop and make available organisational information
2. Provide navigation links and payment information	2.1 Ensure website users have navigation links to access appropriate information, regardless of where they are located within the website 2.2 List various payment options on the website
3. Ensure disclosure of policies and services	3.1 Present a clear website statement outlining charges 3.2 Present warranty information on appropriate screen, prior to finalising orders 3.3 Provide after-sales support and services information, and direct the website user to its location 3.4 Ensure website contains policies regarding cancellations, returns and refunds, and associated conditions
4. Communicate product or service conditions and notifications	4.1 Ensure appropriate screens display limitations and legislative restrictions on who or where goods and services will be sold or shipped to 4.2 Ensure the website provides facilities to confirm orders and cancellations as quickly as possible 4.3 Ensure website provides facilities to communicate to client with minimum delay, details of orders, hold-ups or errors with ordered or cancelled goods or services, information about changed costs or adjustments, and expected date of arrival
5. Ensure customer service support	5.1 Explain service standards and make them available to all potential and current website users 5.2 Ensure website users have a method for providing feedback on aspects of information held on the website 5.3 Ensure acknowledgements of complaints are transmitted to

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ELEMENT	PERFORMANCE CRITERIA
	website users lodging complaints, with a description of what will take place within the organisation to address issues raised

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1	• Reviews a range of documentation of varying quality to identify information relating to the organisation, organisational responsibilities and legislative requirements
Writing	1.2- 1.4, 2.2, 3.1–3.4, 4.1–4.3, 5.1–5.3	• Uses correct spelling and grammar, plain English, a consistent writing style and industry specific terminology to produce web content to organisational guidelines and to web development standards • Uses the appropriate syntax and conventions to upload content onto the web and modify existing web content
Oral Communication	1.1, 1.4	• Uses simple and relevant language and effective listening and questioning techniques to develop and validate organisational information
Navigate the world of work	1.3	• Takes personal responsibility for adherence to legal/regulatory responsibilities relevant to own work context
Get the work done	1.2-1.4, 2.1, 3.1-3.4, 4.1-4.3, 5.1-5.3	• Uses familiar digital systems and tools to access websites, publish on a website and write hypertext markup language (HTML) code • Applies methodical processes to collect and evaluate organisational information for web publication

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT407 Maintain website information standards	ICAICT407A Maintain website information standards	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT407 Maintain website information standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply current programming practices in the preparation and publishing of the organisation web site
- comply with organisation, legislative and industry requirements
- develop policies applicable to cancellations, returns and refunds
- display a site accessible to a variety of customers via electronic communication
- develop and modify information to meet the requirements for an effective and efficient e-commerce interaction.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline consumer protection legislation
- identify content features, including clarity and readability
- discuss document design, web design and usability
- interpret electronic commerce modelling language
- discuss information architecture principles
- discuss instructional design principles
- identify obligations of merchants and service providers
- identify organisational requirements
- outline privacy legislation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a range of organisational policies, procedures and guidelines
- customer service manuals and general data
- appropriate organisational structures
- information standards for legislative and organisational requirements
- software and web development tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT408 Create technical documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create technical documentation that is clear to the target audience and easy to navigate.

It applies to individuals working as technical writers, designers, developers and support staff who are required to produce technical support documents of their work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and analyse documentation requirements and client needs	1.1 Consult with client to identify documentation requirements 1.2 Interpret and evaluate documentation requirements and confirm details with client 1.3 Investigate industry and documentation standards for requirements 1.4 Define and document the scope of work to be produced 1.5 Consult with client to validate and confirm the scope of work
2. Design documentation	2.1 Identify information requirements with reference to layout and document structure 2.2 Create document templates and style guides consistent with information requirements 2.3 Conduct a review of the system in order to understand its functionality 2.4 Extract content that meets information requirements according to copyright restrictions 2.5 Develop the structure of the technical documentation, giving focus to the flow of information, style, tone and content format 2.6 Validate the technical documentation structure with the client
3. Develop documentation	3.1 Write technical documentation based on the template and scope of work using the information gathered 3.2 Translate technical terminology into plain English where appropriate 3.3 Apply content format and style according to documentation standards and templates
4. Evaluate and edit documentation	4.1 Submit technical documentation to appropriate person for review 4.2 Gather and analyse feedback 4.3 Incorporate alterations into the technical documentation 4.4 Edit the technical documentation for technical and

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ELEMENT	PERFORMANCE CRITERIA
	grammatical accuracy
5. Prepare documentation for publication	5.1 Check that the completed technical documentation meets client requirements and scope of work 5.2 Submit the technical documentation to appropriate person for approval 5.3 Prepare the technical documentation for publication and distribution using appropriate channels

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 2.3, 2.4, 4.2, 4.4, 5.1	• Identifies and evaluates organisational documentation and standards, and a range of online and hard copy text containing technical project related terminology and diagrams, then applies the information to the development of appropriate technical documentation • Interprets and comprehends a large range of diagrams, icons, and computer generated text
Writing	1.4, 2.2, 2.5, 3.1-3.3, 4.3, 4.4, 5.3	• Uses correct spelling and grammar, plain English and specific terminology relevant to the project • Uses organisational naming conventions, terminology, style and format to develop technical documents to organisational standards
Oral communication	1.1, 1.3-1.5, 2.1, 2.3, 2.6, 4.1, 4.2	• Elicits and evaluates information using effective listening and questioning techniques • Uses simple and relevant language to confirm understanding of requirements, present information and obtain feedback
Interact with others	5.2	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Navigate the world of work	1.3, 2.4	• Appreciates the implications of legal and regulatory responsibilities related to own work and is beginning to recognise some general legal principles applicable across work contexts
Get the work done	1.4, 2.1, 2.2, 2.5, 3.3, 4.2	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency • Uses familiar digital systems and tools to access, organise, analyse and display information relevant to role • Automatically implements standard procedures for routine decisions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT408 Create technical documentation	ICAICT408A Create technical documentation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT408 Create technical documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish customer needs
- design and develop technical documentation, such as system, procedures, training material and user guides, incorporating appropriate standards
- update document with client feedback
- prepare documentation for publication.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe content features, such as clarity and readability
- outline the principles of document design, web design and usability
- explain the functions and features of templates and style guides
- explain instructional design principles
- list organisational policies, procedures and standards that cover document design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- technical specifications
- documentation standards
- organisational resources and documentation
- information about system, platform, network or application being documented
- relevant standards
- appropriate word processing software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT409 Develop macros and templates for clients using standard products

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop macros and templates for clients using industry recognised software applications.

It applies to individuals working in an office environment who achieve a degree of self-sufficiency as an advanced information and communications technology (ICT) user, and who support software applications activities in the workplace.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine macro or template requirement	1.1 Determine client requirements in line with organisational guidelines 1.2 Develop macro or template specification 1.3 Confirm that macro or template specification meets client's needs and operational guidelines 1.4 Determine documentation requirements
2. Develop macro or template for client	2.1 Develop macro or template to specification using industry recognised software applications 2.2 Demonstrate macro or template to client and obtain feedback 2.3 Amend macro or template as required by client 2.4 Update macro or template specification
3. Provide client support for macro or template	3.1 Document support and instruction requirements 3.2 Provide documentation to client help desk for future support

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4	• Reviews a range of written and online texts to identify relevant organisational guidelines and requirements relating to the job role
Writing	1.2, 1.3, 2.1, 2.3, 2.4, 3.1	• Uses the appropriate macro syntax and conventions to develop macros • Uses correct spelling and grammar; and organisational guidelines for terminology, address format, logos and document structure to develop templates • Uses correct spelling and grammar, plain English and, when necessary, technical terminology to comply with documentation requirements and develop support documentation
Oral Communication	1.1, 1.3, 1.4, 2.2, 3.2	• Uses simple and relevant language and effective listening and questioning techniques to determine client needs and obtain feedback • Uses technical language suitable to the job role when liaising with help desk personnel
Interact with others	3.2	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Navigate the world of work	1.1, 1.3	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Get the work done	1.1, 1.2, 2.1- 2.4	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and takes responsibility for addressing predictable problems in familiar work contexts

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT409 Develop macros and templates for clients using standard products	ICAICT409A Develop macros and templates for clients using standard products	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT409 Develop macros and templates for clients using standard products

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine client needs and specifications for macros and templates
- develop a variety of macros and templates using at least two industry recognised application packages
- provide support to the client for utilising the macros and templates.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline features and functions of particular categories of commercial computing packages, in particular procedures for:
  - creating macros and using default templates supplied by the software application package
  - creating new macros and templates
- identify functions and features of the operating system
- identify features and functions of software and hardware supported by the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- documents detailing organisational policies
- a personal computer where software installation may be performed
- internet connection
- networked computers
- server and workstation hardware and software
- style guides and design brief
- technical documentation and installation manuals
- use of software currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT410 Conduct post-implementation ICT system reviews

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and execute an information and communications technology (ICT) system review following implementation at a point where the system has been operational for some time.

It applies to individuals working in a range of ICT development roles in small to medium enterprises (SMEs) and who are required to review the success of a project with a view to contributing to best practice for future projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Schedule review	1.1 Review organisational guidelines and criteria procedures to identify system implementation results 1.2 Convert the review process into specific criteria 1.3 Contact the appropriate person to schedule timing and venue of review 1.4 Prepare work schedule for the review, based on organisational guidelines, identifying action, items and staff involved 1.5 Contact appropriate vendor and other organisations regarding support or service commitments
2. Carry out review	2.1 Explain the purpose of the review to stakeholders 2.2 Use techniques to obtain data on the areas under review
3. Document and publish results	3.1 Document and record information relating to the system review 3.2 Distribute review results and related documentation to stakeholders 3.3 Gather feedback from stakeholders about the review document 3.4 Schedule additional meetings and discuss the review findings with stakeholders 3.5 Finalise recommendations and action items from the review and distribute to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.3	• Identifies and analyses system specific data, output and feedback containing technical terminology to identify system implementation results
Writing	1.2, 1.4, 2.2, 3.1, 3.5	• Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing information gathering documentation • Employs vocabulary, grammatical structures, appropriate terminology, formatting and structure relevant to the specific task and organisation to develop review criteria, create a schedule and produce reports
Oral Communication	1.1, 1.3-1.5, 2.1, 2.2, 3.3-3.5	• Uses plain English to articulate review and scheduling requirements, and applies effective listening and questioning techniques to elicit data and feedback • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience
Interact with others	3.2, 3.5	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Navigate the world of work	1.1, 1.4	• Complies with explicit organisational policies and procedures
Get the work done	1.1, 1.4, 2.2, 3.3-3.5	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT410 Conduct post-implementation ICT system reviews	ICAICT410A Conduct post-implementation IT system reviews	Updated to meet Standards for Training Packages. Minor edit to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT410 Conduct post-implementation ICT system reviews

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan a review of a system after the implementation has been completed and has been operational for some time
- carry out the review
- document the results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify client business domain
- identify current industry accepted hardware and software products
- discuss implementation process and issues
- compare review techniques
- identify specific project concerned
- discuss role of stakeholders and the degree of stakeholder involvement in a review.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a personal computer (PC) where software installation may be performed
- use of software currently used in industry
- documents detailing organisational style guide or policies
- server and workstation hardware and software
- an internet connection
- an operational system and specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT411 Select and employ software and hardware testing tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select and use software and hardware diagnostic and testing tools.

It applies to individuals in a wide range of information and communications technology (ICT) areas who are required to test software and hardware.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish process operational requirements	1.1 Identify process requirements, ensuring they are accurate, complete, prioritised, have functionality, and reference appropriate method or media types 1.2 Identify conflicting or overlapping requirements 1.3 Document and validate functional requirements of the client 1.4 Identify and validate available resources and budget
2. Select hardware and software for processing function	2.1 Identify and evaluate relevant hardware and software tools with reference to functional requirements 2.2 Identify and analyse relevant products and equipment interdependencies with reference to functional requirements and system architecture 2.3 Identify and document appropriate tools, including their limitations for the required use and industry standards 2.4 Select and acquire tools according to purchasing policies
3. Configure and test hardware and software	3.1 Install and configure appropriate hardware and software tools according to vendor guidelines with reference to system architecture and client functionality requirements 3.2 Configure system architecture for optimal usage 3.3 Prepare, schedule and execute tests and record outcomes 3.4 Track errors, and interpret and correct them 3.5 Make changes to the tested hardware or software based on test results 3.6 Document the hardware and software configuration according to requirements
4. Use and validate software and hardware	4.1 Provide appropriate training of client with reference to guides, instructions and vendor materials 4.2 Use hardware and software according to vendor guidelines 4.3 Validate hardware and software performance with reference to client functional requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.1, 2.4, 3.1, 3.3-3.5, 4.2	• Identifies and comprehends a large range of complex textual and diagrammatic information with systems related terminology to determine organisational requirements and standards, and select appropriate tools and processes
Writing	1.3, 2.3, 2.4, 3.1-3.3, 3.6	• Uses correct spelling and grammar together with relevant systems related terminology to document progress and results, and develop user documentation • Converts jargon, terminology and acronyms into plain English • Uses specific scripting and syntax to install, configure and program the system to user requirements
Oral communication	1.1, 1.2, 1.4, 2.1, 2.2, 3.3, 4.1	• Uses effective listening and questioning techniques and systems related terminology to elicit information about the systems and make the correct tool selection • Uses plain English and interprets technical terminology when liaising with clients and providing training
Numeracy	1.4, 2.4	• Performs mathematical calculations to interpret complex financial information
Interact with others	4.1	• Shares information and resources, provides training voluntarily and feedback to client when required
Navigate the world of work	2.3	• Recognises and follows explicit and implicit protocols and meets expectations associated with own role
Get the work done	1.1, 1.2, 1.4, 2.1-2.4, 3.1-3.4, 3.5, 4.2, 4.3	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems

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		within immediate context

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT411 Select and employ software and hardware testing tools	ICAICT411A Select and employ software and hardware testing tools	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT411 Select and employ software and hardware testing tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate hardware and software that meet functional requirements
- select and use the correct automating tools
- develop an automating process to produce an outcome that is measurable and meets specified requirements
- install, configure and document hardware and software according to vendor guidelines
- validate hardware and software performance against client usage requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and apply batch scripting of nominated automating software routines
- discuss relevant aspects of the client business domain
- identify and apply vendor product directions
- describe current industry accepted hardware and software products, and their features and capabilities
- explain the functions and features of:
  - development tools, including animation development tools
  - development package automating options
  - third-party tools for automating a range of software applications
  - media management tools
- identify interaction between relevant hardware and software products.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a site where automated processing may be carried out
- hardware and software currently used in industry
- a range of automating vendor products currently used in industry
- client requirements documentation
- organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT412 Coordinate and maintain ICT work teams

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish and manage work teams and their performance in an information and communications technology (ICT) environment.

It applies to individuals who are competent in a wide range of general information and communications technologies (ICT) and work in a management capacity within a small to medium enterprise (SME).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish team	1.1 Select and identify suitable team members for a particular project or problem 1.2 Secure agreement from appropriate persons for release of team members 1.3 Identify the type of work team 1.4 Determine time allocation for team members to suit team operations or nature of the project or problem 1.5 Define team and individual responsibilities 1.6 Define how team performance will be measured
2. Coordinate team	2.1 Clarify and plan tasks in consultation with the team 2.2 Allocate tasks appropriately 2.3 Determine and apply motivational factors 2.4 Represent the team at meetings 2.5 Work with team members to manage interpersonal conflict
3. Conduct team activities and review team performance	3.1 Regularly review team performance against objectives and take corrective action where necessary 3.2 Regularly communicate with the team on policies, plans and other matters affecting the team 3.3 Seek the input of team members during the decision making process 3.4 Consult the team regarding proposed workplace changes and improvements to processes 3.5 Recognise team and individual achievement 3.6 Validate team objectives against targets 3.7 Determine ongoing nature of the team and either disband, select new objective, incorporate new team members or change team profile

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.7	• Reviews documentation to identify objectives and organisational requirements
Writing	1.5, 1.6, 2.1, 3.2, 3.5, 3.6	• Develops material and plans to a specific audience using clear and detailed language in order to convey explicit information, requirements and recommendations
Oral Communication	1.1, 1.2, 2.1-2.5, 3.1-3.5	• Participates in a verbal exchange of ideas, and elicits the view and opinions of others, by communicating in a courteous manner, using effective listening and questioning techniques, using appropriate body language, and using appropriate tone and pitch of voice • Presents expectations choosing language appropriate to audience, interacts effectively to remedy issues and disagreements and negotiates outcomes
Numeracy	1.4, 2.1	• Uses basic maths calculations to calculate timelines and schedule
Interact with others	2.4, 2.5, 3.1-3.7	• Identifies key triggers for specific emotions and behaviours, and uses a range of strategies to moderate responses that cause unnecessary problems for others • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking a leadership role • Demonstrates an increasing awareness of the interplay of factors involved in any group interaction • Recognises the importance of building rapport in order to establish effective working relationships
Get the work done	1.1-1.6, 2.1, 2.2, 3.1	• Recognises and anticipates an increasing range of familiar problems, their symptoms and causes, actively looking for early warning signs and implementing contingency plans • Takes responsibility for own workload, negotiating some key aspects with others • Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant

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		information and identifying and evaluating options against agreed criteria • Reflects on ways in which digital systems and tools are used, or could be used, to achieve work goals and begins to recognise strategic and operational applications

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT412 Coordinate and maintain ICT work teams	ICAICT412A Coordinate and maintain IT work teams	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT412 Coordinate and maintain ICT work teams

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish and coordinate teams to meet objectives
- prioritise work schedules to meet organisational guidelines
- provide leadership and guidance to others in the application and planning of project tasks
- review the performance of the team.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline business planning processes relevant to the development of information and communications technology (ICT) business solutions, such as when delegating responsibility and authority
- outline team-building techniques
- outline the principles of effective communication
- outline change management systems
- identify the client business domain
- describe conflict resolution practices
- outline current business practices relating to preparing reports
- identify the general features and capabilities of current industry accepted hardware and software products
- identify information gathering techniques
- identify workplace health and safety (WHS) requirements relating to work safety, environmental factors and ergonomic considerations
- outline principles of equal employment opportunity (EEO) and anti-discrimination
- identify relevant quality assurance practices.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- team members
- organisational policies and operational planning documentation
- current industry products and services.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT413 Relate to clients on a business level

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to formulate, implement, monitor and adjust service level agreements (SLAs).

It applies to individuals who are competent in a wide range of general information and communications technologies (ICT) and provide ICT support to small to medium enterprises (SMEs).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for development of SLA	1.1 Research organisational service standards, values and culture in order to understand the organisational environment 1.2 Investigate and document the goods and services provided by the organisation 1.3 Review current service level agreements (SLAs) if appropriate
2. Develop SLA for consultation	2.1 Research client service needs and preferred level of service 2.2 Determine level of service to be provided to the client 2.3 Develop a draft SLA for the client that incorporates quality, time, target performance and cost specifications
3. Negotiate client support service	3.1 Conduct a session with the client and present the draft SLA in a clear, concise and comprehensive manner 3.2 Present proposed cost and timeframes to the client 3.3 Negotiate terms with client and record alterations if required 3.4 Clarify areas of uncertainty or disagreement 3.5 Document terms of service negotiated with client, and refer document to appropriate person for approval and feedback
4. Monitor, adjust and implement procedures to maintain client focus	4.1 Assess progress in achieving client support service targets, using organisational systems and procedures 4.2 Gather client feedback to improve the provision of client support services where appropriate 4.3 Make adjustments to client support service based on client feedback and in line with organisational guidelines 4.4 Document changes to SLA and report changes to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 4.1, 4.2	• Identifies and evaluates complex business documentation in a variety of formats containing technical terminology and financial information to identify organisational standards, SLA requirements and client feedback
Writing	2.3, 3.5, 4.3, 4.4	• Uses plain English, correct spelling, appropriate grammatical structures and terminology, numerical and financial information, and formatting and document structure relevant to the job role and organisation to develop SLAs
Oral Communication	1.1, 1.2, 2.1, 2.2, 3.1-3.4, 4.1, 4.2, 4.4	• Elicits client requirements and organisational information by using effective listening and questioning techniques • Employs a courteous manner, detailed and clear language, appropriate tone, style, and body language, and effective listening and questioning techniques together with reflective responses to present information and negotiate SLAs
Numeracy	2.2, 2.3, 3.1- 3.5, 4.1, 4,3, 4.4	• Interprets and analyses financial and numerical information from organisational documentation, and uses fractions, decimals and percentages to calculate timelines and cost specifications for SLAs
Interact with others	3.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Navigate the world of work	1.1, 4.1, 4.3	• Recognises and responds to both explicit and implicit protocols within familiar work contexts
Get the work done	1.2, 2.2, 2.3, 4.1-4.3	• Develops plans to manage relatively complex tasks with an awareness of how they may contribute to longer term operational and strategic goals • Takes responsibility for the outcomes of routine decisions related directly to own role

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT413 Relate to clients on a business level	ICAICT413A Relate to clients on a business level	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT413 Relate to clients on a business level

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- negotiate client support service provision
- formulate and document a service level agreement (SLA)
- implement the service level agreement
- meet client requirements for support service within quality, time, target performance and cost parameters.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss business practices, including:
  - change management
  - information gathering techniques
  - planning process, including development of information and communications technology (ICT) business solutions
  - the process for the preparation of reports
- outline the general features and vendor product directions of current industry accepted hardware and software products
- explain the legal principles of commercial contracts and service level agreements
- outline relevant organisational policies, plans and procedures, including contracting
- discuss theoretical concepts relating to negotiation and business relationships.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- organisational policies, procedures and SLAs for the ICT industry
- contexts for negotiating SLAs
- current ICT hardware and software products.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT415 Provide one-to-one instruction

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to convey technical information to an individual client for their specific use.

It applies to individuals who are competent in a wide range of general information and communications technologies (ICT), and support clients in technical areas, including instructing others on an individual basis.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine client needs	1.1 Meet with client to determine learning needs and type of one-to-one instruction required 1.2 Decide upon actions for delivery of one-to-one instruction
2. Organise instruction resources	2.1 Determine the resources required to perform the instruction 2.2 Prepare the instruction plan 2.3 Acquire the resources according to organisational guidelines and prepare the resources for the instruction session 2.4 Provide client with details of instruction plan
3. Provide appropriate instruction	3.1 Provide instruction session to client, using identified instructions 3.2 Document the instruction session according to organisational guidelines 3.3 Refer further instruction requirements or training needs to appropriate person as required
4. Obtain client feedback	4.1 Create or obtain an evaluation and feedback form or other feedback mechanism according to organisational guidelines 4.2 Obtain client evaluation and feedback to ensure the requirements of the client are met 4.3 Review client feedback and discuss suggestions with appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.3, 4.3	• Reviews documentation to identify relevant information relating to the client learning needs and delivery method
Writing	2.2-2.4, 3.2, 4.1	• Uses correct grammar and spelling, and plain English, and translates technical terminology in order to convey and obtain explicit information for a specific audience
Oral Communication	1.1, 2.1-2.4, 3.1, 3.3, 4.2, 4.3	• Uses correct tone, pitch and volume, clear diction, plain English and simple sentence structure, and effective listening and questioning techniques when conducting instruction sessions, liaising with the client and obtaining feedback
Interact with others	3.1, 3.3	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Navigate the world of work	2.3, 3.2, 4.1	• Recognises and responds to both explicit and implicit protocols within familiar work contexts
Get the work done	1.2, 2.1, 2.3	• Uses a combination of planning processes and an increasingly intuitive understanding of context to identify relevant information, including necessary resources and time required to undertake tasks • Takes responsibility for the outcomes of routine decisions related directly to own role

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT415 Provide one-to-one instruction	ICAICT415A Provide one-to-one instruction	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT415 Provide one-to-one instruction

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the instruction required by client
- acquire and prepare associated resources
- demonstrate empathy and understanding of the learner and accommodate different cultures
- convey technical information to individual clients for their specific use in a clear, concise and coherent manner
- convey the meanings of technical jargon.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify delivery and evaluation methods
- discuss adult learning principles and styles
- outline communication and facilitation techniques
- discuss critical behaviour issues and problems that can occur with one-on-one instruction
- describe the general features and capabilities of current industry accepted hardware and software products
- describe the functions and features of common operating systems (OS)
- identify and describe hardware and software supported by the organisation
- recognise the availability of in-house or vendor support
- identify and describe common information and communications technology (ICT) terms and terminology
- describe security and network guidelines and procedures
- outline sources and availability of technical and organisational systems
- specify telephone, fax and online functions and procedures
- identify and incorporate work group procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to client requirements either directly or through a peer or supervisor.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT416 Contribute to the development of strategic plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to participate in the planning process and to contribute to the development of strategic plans.

It applies to individuals who work in a senior capacity within small-to-medium enterprises (SMEs) and are competent in a wide range of general information and communications technologies (ICT).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan for strategy	1.1 Participate in planning committee and clarify roles of people involved in process 1.2 Participate in identifying issues that the planning process should address 1.3 Identify information that must be collected
2. Investigate the current environment	2.1 Investigate mission and vision statements of the organisation 2.2 Investigate current internal and external environment of the organisation
3. Participate in feedback session	3.1 Identify most important issues facing the organisation, using information gathered 3.2 Undertake a review session with appropriate persons to confirm issues identified 3.3 Identify objectives and strategies for the organisation
4. Finalise and validate plan	4.1 Create a written plan to document mission, vision, issues, objectives and strategies of the organisation 4.2 Submit written plan to appropriate persons for approval 4.3 Review feedback and make alterations where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 2.1, 2.2, 4.3	• Identifies, analyses and evaluates a range of online and written complex texts to obtain organisational and industry information relevant to strategic planning
Writing	4.1, 4.3	• Integrates information and ideas from a number of sources, using correct grammar and spelling, specialised and cohesive language, and appropriate document structures to produce reports
Oral communication	1.1-1.3, 2.1, 2.2, 3.2, 4.2	• Elicits the view and opinions of others by using effective listening and questioning techniques, appropriate tone, style and body language, and by giving reflective responses • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information
Navigate the world of work	2.1	• Recognises and responds to both explicit and implicit protocols within familiar work contexts, and appreciates the importance of identifying and responding to protocols in new situations
Interact with others	4.2	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.1, 2.2, 3.1, 3.3, 4.1	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Makes a range of critical and non-critical decisions in various situations, taking a range of constraints into account

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT416 Contribute to the development of strategic plans	ICAICT416A Contribute to the development of strategic plans	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT416 Contribute to the development of strategic plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine criteria and issues for planning process
- undertake feedback session to identify issues, goals and outcomes that meet stakeholder requirements
- create a written plan documenting objectives and strategies of organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the process of information gathering techniques
- describe quality assurance practices
- outline the components of the business planning process relevant to the development of strategic plans
- discuss current business practices in preparing reports, particularly for contributing to the development of a strategic plan that identifies:
  - final expected results
  - details how these results will be achieved.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a site and personnel where a strategic business plan may be developed
- detailed information relating to current needs and project requirements of business
- client expectations brief
- business mission, vision statements and objectives.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT417 Identify, evaluate and apply current industry-specific technologies to meet industry standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, evaluate and apply industry specific technologies to ensure that the quality of the entire business process is maintained to the highest possible level.

It applies to individuals who support information and communications technology (ICT) activities in the workplace across a wide range of ICT areas, including technical support, network administration, programming, testing, web technologies, software applications and digital media technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to identify and evaluate industry specific technologies	1.1 Identify technologies specific to an industry sector 1.2 Acquire industry-specific technologies 1.3 Identify, classify and use industry specific technologies for the benefit of the organisation
2. Apply industry specific technology to assist in solving organisational problems	2.1 Conduct testing of industry specific technologies 2.2 Apply features and functions of industry specific technologies to provide a suitable solution to an identified problem 2.3 Demonstrate depth of knowledge of enabling technologies to an accepted industry standard 2.4 Access and use sources of information relating to the industry specific technologies
3. Review and evaluate industry-specific technology performance	3.1 Review and evaluate industry specific technologies for performance, usability and benefit to the organisation 3.2 Determine environmental considerations involved with using the technologies 3.3 Seek feedback from users where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1-1.3, 2.3, 2.4	• Investigates, evaluates and applies information from a range of complex and technical texts to expand own knowledge and identify industry specific technologies that will benefit the organisation
Reading	1.1, 1.3, 2.1, 2.4, 3.2, 3.3	• Identifies and interprets technical online and hard copy documentation containing complex terminology and diagrams to identify industry specific technologies that will benefit the organisation, and to determine environmental considerations
Oral Communication	1.1-1.3, 2.4, 3.1-3.3	• Elicits information and feedback by using effective listening and questioning techniques to identify and evaluate industry specific technologies • Uses clear, easy-to-understand language and translates industry specific terminology into plain English when talking to users and when necessary
Navigate the world of work	2.4, 3.2	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations • May recognise problems that have the potential to become legal issues and takes steps to address them before they escalate
Get the work done	1.1-1.3, 2.1-2.4, 3.1	• Understands key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology and when seeking to understand the potential of new technology • Develops plans to manage relatively complex non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT417 Identify, evaluate and apply current industry specific technologies to meet industry standards	ICAICT417A Identify, evaluate and apply current industry specific technologies to meet industry standards	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT417 Identify, evaluate and apply current industry-specific technologies to meet industry standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify new and emerging industry specific technologies
- apply and evaluate features and functions of identified industry specific technologies to an industry standard.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss current industry specific technology trends and directions, and the major standards
- outline vendor product directions
- describe the general features, capabilities and application of current industry hardware and software products
- discuss information gathering techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a site where industry specific technologies may be used
- industry specific technologies currently used in industry
- documents detailing workplace health and safety (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to maintain professional and ethical conduct, as well as to ensure that personal information of stakeholders is handled in a confidential and professional manner when dealing with stakeholders in an information and communications technology (ICT) environment.

It applies to ICT personnel who are required to gather information to determine the organisation's code of ethics, and protect and maintain privacy policies and system security.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Protect intellectual property	1.1 Identify current legislation and standards relating to intellectual property and copyright 1.2 Investigate current organisational copyright policy 1.3 Adhere to organisational policy and current legislation in work practices
2. Contribute to copyright policy	2.1 Contribute to the creation or updating of the organisation's copyright policy and procedures to align with legislation and industry standards 2.2 Distribute new or revised policy and procedures to stakeholders
3. Protect rights of stakeholders	3.1 Identify and document the relevance of legislation and standards to organisational outcomes 3.2 Investigate and review organisational privacy policy and procedures 3.3 Investigate and review organisational code of ethics 3.4 Determine the integrity, confidentiality, security and availability of information as required by organisational policy 3.5 Maintain confidentiality and proprietary rights of stakeholder interests
4. Contribute to privacy policy	4.1 Contribute to the creation or updating of the organisational privacy policy and procedures to align with privacy legislation 4.2 Distribute new or revised policy and procedures to stakeholders 4.3 Implement new work procedures and collect feedback from stakeholders 4.4 Ensure the integrity, confidentiality, security and availability of information as required by organisational policy
5. Maintain privacy policy	5.1 Review work practices to ensure application of privacy policy and procedures 5.2 Maintain the integrity, confidentiality, and availability of information as required by organisational privacy policy 5.3 Review work practices to ensure system security according

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ELEMENT	PERFORMANCE CRITERIA
	to organisational privacy policy
6. Contribute to creation of ethics code	6.1 Assist in developing or updating a code of ethics to align with legislation and standards for the organisation 6.2 Distribute the new ethics code to stakeholders and collect feedback 6.3 Implement new ethical work procedures and collect feedback 6.4 Review ethical work practices and feedback to ensure application of the code
7. Maintain ethics code	7.1 Perform regular checks to ensure stakeholders understand and are continuing to apply the code of ethics in the workplace 7.2 Establish a review and grievance procedure to enable confidential reporting of any ethical issues 7.3 Interview and regularly follow up with stakeholders to ensure they are receiving consistent and appropriate service in dealing with the code of ethics

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1-3.4, 4.3, 5.1, 6.1, 6.3, 6.4	• Identifies, analyses and evaluates complex text to determine legislative and organisational standards, applies the information to determine the effectiveness of current organisational policies and processes
Writing	2.1, 3.1, 4.1, 6.1, 7.2	• Integrates information and ideas from a range of sources, utilising appropriate support materials and specialised and cohesive language in a format and style appropriate to the audience and organisation
Oral Communication	2.1, 4.1, 4.3, 6.1-6.3, 7.1, 7.3	• Articulates ideas and requirements clearly, based on techniques appropriate to audience and environment • Participates in a verbal exchange of ideas and elicits the view and opinions of others by listening and questioning
Navigate the world of work	1.1-1.3, 2.1, 3.1-3.4, 5.2, 5.3, 6.1	• Keeps up to date on changes to legislation or regulations relevant to own rights and responsibilities, and considers implications of these when negotiating, planning and undertaking work
Interact with others	2.2, 4.2, 6.2	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	3.5, 4.3, 4.4, 5.1-5.3, 6.3, 6.4, 7.1, 7.2	• Uses digital technologies and systems safely, legally and ethically when gathering, storing, accessing and sharing information, with a growing awareness of the permanence and transparency of all activities • Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses each experience to reflect on the ways in which variables impact on decision outcomes and to gain insights into what constitutes effective decision making in different contexts

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment	ICAICT418A Contribute to copyright, ethics and privacy in an IT environment	Updated to meet Standards for Training Packages. Minor edit to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT418 Contribute to copyright, ethics and privacy in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse legislation and standards relating to professional conduct and privacy in the information and communications technology (ICT) industry
- contribute to the development of a code of ethics and monitor the workplace to ensure code of ethics is being applied and is appropriate
- contribute to the development of a privacy policy and monitor the workplace to ensure the policy is being applied and is appropriate.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss codes of ethics pertinent to computing industry
- discuss federal and state or territory legislation and policy relevant to an ICT environment and relating to:
  - access and equity
  - copyright and intellectual property
  - workplace health and safety (WHS)
  - privacy
- outline organisational communication processes and procedures
- outline organisational requirements for customer service
- discuss the security features of server operating systems
- explain system security procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant organisational policies, legislation and standards documentation
- industry codes of practice.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT419 Work effectively in the digital media industry

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to work effectively as an individual or in a team environment in the digital media industries.

It applies to individuals who use digital media technologies to work in the information and communications technology (ICT) industry as digital media designers, developers, programmers, contractors or digital media authoring specialists.

No licensing, legislative or certification requirements apply to this unit at the time of publication

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Communicate effectively with others	1.1 Research and analyse information sources and data related to the digital media industry 1.2 Engage with key players in the organisation using a range of communication tools and media 1.3 Plan and develop a communication strategy for an enterprise or workplace and clients 1.4 Prepare reports in a variety of formats and media
2. Perform own work effectively	2.1 Develop a work plan and schedule 2.2 Respond to requests and resolve client queries and issues as they arise 2.3 Apply legislative and regulatory requirements 2.4 Apply industry codes of practice and guidelines
3. Review own communication and work effectiveness, and make improvements	3.1 Seek and respond positively to comments and feedback from peers and clients using evaluation techniques 3.2 Review own communication strategies and practices, and make continuous improvements 3.3 Review own work plan and schedule against milestones or key performance indicators (KPIs), and make improvements 3.4 Undertake training and professional development activities 3.5 Participate in discussions and forums, and generate ideas for improvement

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.2-3.5	• Builds on prior knowledge by analysing own performance, ascertaining areas of need and investigating and participating in a range of learning programs
Reading	1.1, 3.2-3.4	• Analyses and compares a range of textual and diagrammatic information related to the digital media industry in order to develop a communications solution • Recognises and interprets a large range of computer generated text, icons and images
Writing	1.2-1.4, 2.1, 3.2, 3.3	• Uses correct spelling and grammar, plain English and terminology specific to the digital media industry to produce documents, plans, schedules and reports, and liaise with key stakeholders
Oral Communication	1.1, 1.2, 2.2, 3.1, 3.4, 3.5	• Elicits and evaluates information using project related terminology and effective listening and questioning techniques • Uses plain English and, where necessary, project related terminology to liaise with clients, present information and obtain feedback
Navigate the world of work	2.3, 2.4	• Keeps up to date on changes to legislation or regulations relevant to own rights and responsibilities, and considers implications of these when negotiating, planning and undertaking work
Interact with others	1.2	• Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking a leadership role on occasion
Get the work done	1.1, 1.3, 1.4, 2.1, 2.2, 3.2, 3.3	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • In familiar contexts, responds intuitively to problems requiring immediate attention, quickly drawing on past experience to devise solutions • Uses a range of digitally based technology and applications to access and filter data, extract, organise, integrate and share relevant information

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		in increasingly effective ways • Uses each experience to reflect on the ways in which variables impact on outcomes and to gain insights into what constitute effective strategies and practices for future work

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT419 Work effectively in the digital media industry	ICAICT419A Work effectively in the digital media industry	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT419 Work effectively in the digital media industry

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and analyse information and communicate effectively using a range of media and formats
- perform according to work plan and organisational requirements and values
- follow and apply requirements of legislation and regulations
- review and implement improvements to own work and communication
- review own communication strategies and practices and identify areas for improvement
- review work plan and schedule key milestones
- carry out professional development activities related to a work plan
- seek and respond to client queries and feedback.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list current industry accepted hardware and software digital media products and discuss their features and capabilities
- discuss the work health and safety (WHS) standards that apply to working in the digital media industries
- outline the operational environment, including customer base, company products and services
- explain the importance of communication and work plans in a team environment
- outline organisational:
  - code of conduct and values that are consistent with the organisational mission
  - policy and procedures
  - systems, management structure and governance arrangements
- discuss the principles of equal employment opportunity (EEO) and anti-discrimination
- outline the role and positioning of digital media within the overall business objectives of the organisation
- recognise and define digital media terminology
- describe the roles and responsibilities of personnel in a digital media industry
- identify and outline current federal and state legislative and regulatory requirements, codes of practice and policy relating to work in a digital environment.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a range of current industry information
- appropriate ICT equipment and technology to research and analyse industry information.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT420 Develop client user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and document a client user interface that integrates with front-end applications.

It applies to individuals who work in small-to-medium enterprises (SMEs) as software designers and developers and have achieved a degree of autonomy.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare design for interface	1.1 Review requirements and other documentation to determine user needs 1.2 Investigate system environment to determine the impact of user interface design 1.3 Review organisational goals to ensure consistency with organisational styles 1.4 Define data query and report formats for the user interface design where appropriate 1.5 Document needs and findings, and obtain approval for the proposed interface from the appropriate person
2. Design and document user interface	2.1 Design menu structures according to requirements and acceptance criteria, and following design principles 2.2 Design screen dialogues according to requirements and acceptance criteria, and following design principles 2.3 Design batch procedures where appropriate to technical specifications and acceptance criteria 2.4 Design online help and tutorials for the prototype, and following design principles 2.5 Document prototype according to organisational goals 2.6 Submit prototype to appropriate person for sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4	• Identifies and interprets a variety of hard copy and online technical and design information to identify system environment, organisational requirements and clarify user requirements
Writing	1.4, 1.5, 2.1-2.5	• Uses correct spelling and grammar, plain English and specific terminology to produce documents and tutorials to organisational guidelines and user requirements • Uses the appropriate programming syntax and conventions to perform the job role • Uses concise plain English and identifies and applies organisational designs, styles and interface, writing principles consistently on titles, text links, buttons, error messages and other interface objects
Oral Communication	1.1-1.5, 2.6	• Elicits and evaluates information using effective listening and questioning techniques • Uses simple and relevant language to confirm understanding of requirements, liaise with the client and obtain feedback
Navigate the world of work	1.3, 2.5	• Considers the implications of organisational policies and procedures when planning and undertaking work
Interact with others	2.6	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 1.2, 1.4, 2.1-2.3	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses a range of digitally based technology and applications to access and filter data, extract, organise, integrate and share relevant information in increasingly effective ways

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT420 Develop client user interface	ICAICT420A Develop client user interface	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT420 Develop client user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine impact of user interface design in the system environment and identify appropriate data query and report formats
- design menu structures according to design principles
- design screen dialogues in line with requirements and acceptance criteria
- design batch procedures
- develop online help and tutorials for prototype.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify client business area
- discuss current industry design principles
- identify the general features and capabilities of current industry accepted hardware and software products
- identify general features and capabilities of current industry accepted user interfaces
- identify front-end systems
- discuss GUI and web design principles.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- design specifications
- organisational standards for documentation and version control
- project management process and hierarchy
- a usability test plan
- agreed usability metrics.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT421 Connect, maintain and configure hardware components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure and maintain personal computer devices, including mobile devices according to client and user requirements.

It applies to individuals who utilise a range of technical skills to plan and implement activities to connect system components.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify hardware components	1.1 Identify different types of personal computer devices 1.2 Identify and categorise the different personal computer components, including mobile personal computer components 1.3 Define the purpose and characteristics of the different personal computer component categories 1.4 Distinguish between the different types of devices within each personal computer component category
2. Identify types of peripheral hardware components	2.1 Identify and categorise the different peripheral hardware components 2.2 Define the purpose and characteristics of the different peripheral hardware components 2.3 Distinguish between the different types of devices within each peripheral hardware component category
3. Install and configure personal computer components	3.1 Install and configure personal computer components 3.2 Install and configure mobile personal computer components 3.3 Develop plans, with prioritised tasks and contingency arrangements, for the installation and configuration of selected components with minimum disruption to clients 3.4 Liaise with appropriate person to obtain approval for the plans 3.5 Install and configure components according to plan, installation procedures and organisational requirements 3.6 Use appropriate testing tools to test components for error-free performance 3.7 Identify and solve identified problems 3.8 Test and enhance system performance, using knowledge of the system, to meet organisational benchmarks 3.9 Document the installation and configuration process according to organisation guidelines 3.10 Develop and document a maintenance plan and schedule based on vendor specifications for the installed components
4. Install and configure	4.1 Install and configure print devices

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ELEMENT	PERFORMANCE CRITERIA
print devices	4.2 Detect and identify common printer issues 4.3 Undertake printer issue resolution to meet client requirements
5. Evaluate modified system	5.1 Collect client or user feedback and analyse against client requirements 5.2 Correct identified shortcomings in the system and record actions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.1, 2.3, 3.5, 3.6, 5.1	• Identifies, interprets and analyses online and hard copy documentation containing complex information and communications technology (ICT) related terminology, acronyms and concepts
Writing	3.3, 3.9, 3.10, 5.2	• Uses correct spelling, grammar and plain English, together with the ICT specific terminology, diagrams, and syntax to convey explicit recommendations, requirements and information
Oral Communication	1.3, 2.2, 3.4, 5.1	• Converts highly technical language and terminology to plain English to communicate ideas and plans, and gather feedback from clients
Numeracy	1.4, 2.3	• Recognises and interprets numerical data associated with device and component specifications
Navigate the world of work	3.5, 3.8, 3.9	• Keeps up to date with organisational standards and procedures relevant to own rights and responsibilities, and considers implications of these when negotiating, planning and undertaking work
Get the work done	1.1-1.4, 2.1, 2.3, 3.1-3.3, 3.6- 3.8, 3.10, 4.1-4.3, 5.1, 5.2	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • In familiar contexts, responds intuitively to problems requiring immediate attention, quickly drawing on past experience to devise solutions • Considers purpose, needs and limitations when selecting devices and applications for different tasks • Uses each experience to reflect on the ways in which variables impact on outcomes and to gain insights into what constitute effective strategies and practices for future work

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT421 Connect, maintain and configure hardware components	ICAICT421A Connect, maintain and configure hardware components	Updated to meet Standards for Training Packages Minor edits to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT421 Connect, maintain and configure hardware components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install components across a variety of situations and account for unexpected contingencies
- modify system's hardware, internal hardware and peripheral hardware components to meet client requirements
- identify and plan the modification and connection of hardware, internal hardware and peripheral hardware components according to vendor and technical specifications
- test components and rectify identified problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and categorise the different types of personal computer devices, hardware, internal hardware and peripheral hardware components
- outline environmental considerations in e-waste disposal
- discuss systems diagnostic software
- identify areas of the operating system (OS) related to configuration and testing
- identify current industry accepted hardware and software products
- outline organisational guidelines
- outline organisational requirements
- identify system's current functionality
- identify vendor specifications and requirements for component installation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- personal computer devices, hardware, internal hardware and peripheral hardware components for installation and configuration
- current industry standard performance testing software
- documents detailing organisational guidelines and requirements
- technical manuals, tools and test equipment.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT422 Participate in ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply the principles of service management when working in an information and communications technology (ICT) service desk environment.

It applies to individuals who work in ICT service roles and are responsible for providing ICT service desk support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to work on a service desk	1.1 Identify policy and procedures of service desk quality 1.2 Apply concepts and terminology associated with a service desk environment 1.3 Use appropriate service principles
2. Support a service desk	2.1 Use service desk systems to open a new service call 2.2 Inform customer of the progress of the call using service principles 2.3 Escalate a service desk call following service principles 2.4 Implement service desk closure principles 2.5 Seek user feedback following closure of a service desk call
3. Apply continuous improvement to service desk	3.1 Review service desk records 3.2 Plan methods of improving performance 3.3 Document proposed improvements and submit to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1	• Identifies and interprets textual and organisational documentation containing ICT specific terminology to service desk quality, and review records
Writing	2.5, 3.3	• Uses clear, concise language, correct spelling and grammar, and relevant ICT terminology to obtain feedback and document proposed improvements
Oral Communication	1.2, 1.3, 2.1-2.5	• Employs a courteous manner, appropriate tone, detailed and clear language, specific ICT terminology, and effective listening and questioning techniques together with reflective responses to elicit customer information and give and receive feedback
Interact with others	3.3	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 1.2, 2.1, 2.4, 3.2	• Takes responsibility for defining key aspects of own workload, balancing own needs and priorities with customers' needs • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT422 Participate in ICT services	ICAICT422A Participate in IT services	Updated to meet Standards for Training Packages. Minor edit to title	Equivalent unit

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Assessment Requirements for ICTICT422 Participate in ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- provide service desk support
- plan and document strategies to improve service desk performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline:
  - enterprise escalation policy and procedures
  - industry best practice in information and communications technology (ICT) service desk support
- identify and describe:
  - basic technical service management terminology
  - legislation, codes of practice and other formal agreements that directly impact on resolution processes
  - quality assurance of processes and procedures relating to service desk
  - service management relating to service desk.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- an ICT service desk environment
- current service logs and procedures
- service desk software
- customer contact technologies currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT423 Select cloud storage strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse business requirements, and to select the best strategies for providing a cloud storage solution.

It applies to those engaged in developing a cloud storage strategy for an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan for the implementation of a cloud storage solution	1.1 Review the business requirements and identify the enterprise standards 1.2 Review the major characteristics relating to cloud storage, and identify the advantages and disadvantages of its use 1.3 Review the suitability of "Big Data" in the cloud storage solution
2. Select strategies for implementing cloud storage solutions	2.1 Research, and review, the major cloud storage applications to determine possible cloud storage business needs 2.2 Identify the most relevant business functions for cloud storage deployment 2.3 Evaluate possible providers of cloud storage solutions 2.4 Review service level agreements (SLAs) and identify any hidden costs 2.5 Develop a cloud storage strategy, according to the identified business data deliverables
3. Evaluate the effectiveness of cloud storage	3.1 Review and evaluate, cloud storage technologies for performance, usability and benefit to the enterprise 3.2 Document and action the required improvements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1	• Draws on a broad range of strategies to build and maintain understanding throughout complex texts • Organises, evaluates and critiques ideas, and information, from a wide range of complex texts
Writing	1.1-1.3, 2.5, 3.2	• Generates complex written texts, demonstrating control over a broad range of writing styles and purposes
Numeracy	2.4	• Analyses and synthesises highly-embedded mathematical information, in a broad range of tasks and texts
Navigate the world of work	1.1, 2.5, 3.1	• Develops, and implements, strategies that ensure that the organisational policies, procedures, and regulatory requirements are met • Monitors and reviews the organisation's policies, procedures, and adherence to legislative requirements, in order to implement and manage change
Get the work done	1.2, 2.5, 3.2	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data, and seeks feedback, to improve plans and processes • Makes high-impact decisions in a complex and diverse environment, using input from a range of sources • Explores and incubates, new and innovative ideas through unconstrained analysis and critical thinking, to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT423 Select cloud storage strategies	ICAICT423A Select cloud storage strategies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT423 Select cloud storage strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review the benefits and challenges associated with implementing a cloud storage solution
- determine and document the most appropriate cloud storage solutions for the enterprise, and effective strategies for their implementation
- review the implementation of a cloud storage strategy, and identify any areas for improvement.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the business types that may have cloud storage requirements
- define the current trends and directions in information and communications technology (ICT), and the major industry technology standards used in cloud storage services
- analyse the advantages and disadvantages of cloud storage
- define "Big Data" and its application within the corporate environment
- identify and specify, the vendor product directions in cloud storage services
- identify and describe, current industry hardware and software products, and their general features, capabilities and application, especially where applied to cloud storage technologies
- define the characteristics of cloud storage that must be included in service level agreements
- describe the additional costs that impact on a cloud storage strategy.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where cloud storage technologies may be used
- the cloud storage technologies currently used in industry
- service level agreements (SLA) documentation relevant to cloud storage scenarios
- documentation detailing work health and safety (WHS) standards, environmental guidelines, and enterprise requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT501 Research and review hardware technology options for organisations

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research and evaluate existing and emerging technologies and hardware solutions to support organisational strategic goals.

It applies to individuals in senior roles who administer and manage information and communications technology (ICT) support in small-to-medium enterprises (SMEs) using a wide range of general ICT technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine organisational needs	1.1 Establish organisational needs and selection criteria for new technology 1.2 Review strategic goals and determine future requirements 1.3 Assess physical infrastructure and financial parameters against strategic goals
2. Research vendors, suppliers and ICT industry specialists	2.1 Determine suitable suppliers and vendors 2.2 Source information from suppliers and vendors 2.3 Assess vendor information against industry standards 2.4 Review emerging standards and applications for compatibility with supplier and vendor information
3. Evaluate and report on hardware technology options	3.1 Review and test hardware to identify suitability for organisational requirements 3.2 Identify possible project risks associated with identified hardware 3.3 Document findings in a report and present to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	2.1-2.4	• Investigates, evaluates and applies information from a range of complex and technical texts to expand own knowledge in order to identify hardware technology that will support strategic goals
Reading	1.1-1.3, 2.1-2.4, 3.1-	• Identifies, interprets and evaluates technical online and hard copy documentation containing complex terminology and diagrams to identify hardware technology that will benefit the organisation
Writing	3.3	• Uses correct spelling and grammar, and specialised, cohesive language in a format and style appropriate to the specific audience to present an evaluation of hardware technology
Oral Communication	1.1-1.3, 2.1, 2.2, 2.4, 3,1, 3.2	• Uses effective listening and questioning techniques, and clear, easy-to-understand language, and translates technical terminology into plain English when clarifying strategic goals and assessing project risks • Uses large range of technical terminology when eliciting information about new and emerging hardware technologies
Numeracy	1.3, 3.2	• Interprets financial information and applies mathematical calculations relating to time constraints and budgetary information
Navigate the world of work	2.3, 2.4	• Considers the implications of organisational policies and procedures when planning and undertaking work
Interact with others	3.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.1, 3.1, 3.2	• Applies formal processes when planning more complex tasks, producing plans with logically sequenced steps and reflecting some awareness of resource constraints • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential

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		of new technology

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT501 Research and review hardware technology options for organisations	ICAICT501A Research and review hardware technology options for organisations	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTICT501 Research and review hardware technology options for organisations

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and plan approaches to technical problems or management requirements
- access and convey conceptual information regarding emerging technology in relation to organisational needs
- evaluate information, using it to forecast for planning or research purposes
- recommend technology options
- document findings in a report.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe and explain the business planning process relevant to researching technology
- outline and explain client business needs that can be satisfied by the provision of information and communications technology (ICT) products and services
- describe and outline current business practices in preparing reports
- identify and outline current industry and technology information sources
- outline general features and capabilities of current industry accepted hardware, cabling and software products, and identify emerging trends and product design
- discuss equipment performance benchmarking
- identify industry networks, key individuals and organisations within the ICT industry
- identify information gathering techniques
- outline quality assurance practices to promote reliable investigation processes
- identify vendor product directions:
  - access and security products
  - next generation networks
  - self-configuring asymmetric digital subscriber line (ADSL) or cable modem-router-switch for the small office/home office (SOHO) market
  - wireless standards.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- network or computer layout documentation and premises plans
- network components
- equipment specifications
- organisational guidelines
- business plan or model
- journals of industry and professional associations
- relevant standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT502 Develop detailed component specifications from project specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse requirements of the project specifications in order to produce a set of high-level component specifications.

It applies to systems designers who are required to produce component specifications for programmers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop components	1.1 Document behaviour scenarios according to documentation standards 1.2 Identify or develop components according to project specifications 1.3 Prepare diagrams according to standards
2. Prepare schema	2.1 Analyse and document component connectivity 2.2 Identify and incorporate data flow iteration 2.3 Prepare component action diagrams according to standards
3. Prepare component model	3.1 Describe roles and responsibilities 3.2 Review and update functional requirements 3.3 Specify interface components and component relationships 3.4 Prepare interaction diagrams according to standards
4. Iterate and review model	4.1 Conduct walk-through of current model and review functionality 4.2 Identify relationships to ensure integration of model 4.3 Review class service requirements 4.4 Prepare initial test criteria 4.5 Implement process for incremental testing

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.2, 4.1-4.3	• Interprets and analyses text with complex terminology, diagrams, code, syntax, icons and symbols to evaluate current system functionality and technical requirements, and develop diagrams using industry specific software
Writing	1.1-1.3, 2.1-2.3, 3.1-3.4, 4.4, 4.5	• Uses the correct spelling and grammar, clear plain English, task related terminology, and a formal document structure, format and style appropriate to the audience and organisation • Selects suitable vocabulary, terminology, labelling and naming conventions to develop diagrams using industry specific design tools
Numeracy	1.2	• Interprets numerical information and applies basic mathematical calculations relating to time durations and budgetary information
Navigate the world of work	1.1, 1.3, 2.3, 3.4	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Get the work done	1.2, 2.1, 2.2, 3.2, 3.3, 4.1- 4.5	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for efficiency • In familiar contexts, responds intuitively to problems requiring immediate attention • Considers purpose, needs and limitations when selecting devices and applications for different tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT502 Develop detailed component specifications from project specifications	ICAICT502A Develop detailed component specifications from project specifications	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT502 Develop detailed component specifications from project specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and document high level component specifications relevant to the project specifications
- analyse and document component connectivity and relationships
- document and review component modelling.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline appropriate design tools and their use
- discuss and explain configuration management
- outline the key features of a cost-benefit analysis
- identify and apply current industry accepted design methodologies and hardware and software products, including broad knowledge of general features and capabilities
- explain data modelling techniques
- describe program development methodologies
- describe quality assurance practices for preparing component models
- outline relevant standards and organisational policies
- specify current system functionality for analysing components.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- technical specifications
- organisational and process goals
- standards for model development
- computer aided software engineering (CASE) tools
- project deliverables
- test plan
- project budget
- outcomes of the business analysis process
- appropriate software and hardware.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT503 Validate quality and completeness of system design specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to check the system design specifications against outcomes and quality standards.

It applies to individuals working as system designers who are required to validate system design specifications to ensure that they meet the required organisational audit standards.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine audit criteria	1.1 Investigate the system or product for which the quality audit is being performed to understand its functionality 1.2 Determine the objectives to be achieved by the quality audit 1.3 Determine the scope of the quality audit 1.4 Develop a list of audit criteria and quality benchmarks 1.5 Develop a metric to classify the audit criteria 1.6 Determine the audit technique or methodology to be followed 1.7 Examine and detail the resources available to carry out the audit 1.8 Document the objectives, scope, criteria, technique and resources in an audit plan
2. Audit aspects of the final system	2.1 Use the audit criteria to collect evidence about the functionality and quality of the final system, including documentation 2.2 Use a checklist to monitor audit progress 2.3 Document audit outcomes as the audit progresses
3. Review and confirm contract and specifications	3.1 Review system contract against audit outcomes 3.2 Compare system functionality against audit outcomes and system contract 3.3 Identify items of non-compliance where audit outcomes do not meet performance targets or fall short of contract requirements 3.4 Review system procedures for corrective action 3.5 Document items of non-compliance and proposed corrective action

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 1.7, 3.1-3.3	• Interprets, analyses and evaluates text with complex terminology, diagrams, code, syntax, icons and symbols to: evaluate current system functionality, determine audit objectives, scope and criteria, and review audit findings
Writing	1.4, 1.5, 1.7, 1.8, 2.2, 2.3, 3.5	• Uses plain English, appropriate grammatical structures and terminology, diagrams and flow charts, numerical information, and formatting and document structure relevant to the job role and organisation to develop an audit plan and document audit results
Oral Communication	1.1-1.3, 1.7, 2.1, 3.1, 3.4	• Uses effective listening and open questioning techniques to obtain information and elicit the view and opinions of others • Uses appropriate questioning strategies, avoiding loaded or leading questions, when collecting evidence • Uses specific and complex system/product terminology when applicable, translating complex terms into plain English as required by the audience
Numeracy	1.2-1.5, 3.1-3.4	• Interprets and analyses numerical and financial information, and applies mathematical calculations and financial functions related to performance and financial metrics developed
Navigate the world of work	1.4	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Get the work done	1.1-1.7, 3.2-3.4	• Applies formal processes when planning more complex tasks, producing plans with logically sequenced steps and reflecting some awareness of resource constraints • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot • Uses analytical processes in a variety of situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT503 Validate quality and completeness of system design specifications	ICAICT503A Validate quality and completeness of system design specifications	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT503 Validate quality and completeness of system design specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine audit criteria
- conduct an audit
- review system procedures for non-compliance
- propose corrective actions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline acceptance criteria
- translate detailed design principles and specification standards
- discuss fault tolerance technologies
- describe the process of quality audits
- discuss quality levels, both generally and as required by the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- audit tools
- documentation guidelines
- relevant standards and benchmarks
- service level agreement (SLA)
- archive policies
- acceptance criteria
- ICT security specifications
- live system, including database, system files and designed interface
- technical specifications of system.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT504 Confirm transition strategy for a new system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to confirm a transition strategy to a new system, based on the revised system design and newly developed change management plan.

It applies to individuals who work as part of a team in a range of information and communications technology (ICT) positions, and are required to plan for a transition to new system websites, networks or software.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm delivery and acceptance plan	1.1 Confirm phased delivery with the client and project team 1.2 Confirm method of acceptance and acceptance criteria 1.3 Confirm that acceptance test plan is in place and agreed
2. Confirm data take-up plan	2.1 Identify the data source for each database 2.2 Analyse possible integrity constraints 2.3 Design the data conversion workflow, taking into consideration data validation, data clean-up and data loading 2.4 Identify interface requirements, data take-up method, complexity and effort required 2.5 Develop required data conversion contingencies and confirm with appropriate person
3. Confirm cutover plan	3.1 Agree on the conversion window in operational timescale with appropriate person 3.2 Plan and confirm parallel running with appropriate person 3.3 Confirm approval of dependencies with appropriate person 3.4 Confirm approval of fall-back options with appropriate person 3.5 Confirm approval of checkpoints, tests and responsibilities with appropriate person 3.6 Confirm approval of resources, tasks and timescales with appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 2.1, 2.2, 2.4	• Identifies and analyses complex electronic and hard copy documentation, information and data containing specific terminology, diagrams and numerical information to organise conversion and identify data convention contingencies
Writing	1.1-1.3, 2.3, 2.5, 3.1-3.6	• Uses clear language and plain English with task specific technical terminology to confirm approval for each stage of the conversion • Applies the formal labels, logos, formatting and document structure relevant to the organisation to ensure approval/signoff obtained is valid
Oral Communication	1.1-1.3, 2.1, 2.4, 2.5, 3.1-3.6	• Elicits information by using effective listening and open questioning techniques • Articulates strategies clearly and distinctively, based on techniques and language appropriate to audience and environment, and uses probing, clarifying questions to ensure strategies are understood
Numeracy	1.2, 1.3	• Interprets and analyses numerical and financial information, and applies mathematical calculations and financial functions related to timeframe, logistics and budgets
Get the work done	2.1- 2.5. 3.2	• Applies formal processes when planning more complex tasks, producing plans with logically sequenced steps and reflecting some awareness of resource constraints • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot • Uses analytical processes in a variety of situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT504 Confirm transition strategy for a new system	ICAICT504A Confirm transition strategy for a new system	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT504 Confirm transition strategy for a new system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- confirm acceptance plan
- develop a data take-up plan
- confirm cut-over plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss and apply conversion strategies
- outline current business practices related to transition strategies
- discuss cut-over strategies
- discuss post-converging strategies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- ICT specifications
- change management plan
- acceptance test plan
- ICT security assurance specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT505 Determine acceptable developers for projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that development projects are contracted to developers who are able to accomplish the task within the mutually agreed parameters of the project.

It applies to individuals who manage a range of information and communications technology (ICT) projects, including software development, hardware procurement and implementation, network analysis and deployment, and web and/or system development.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Specify development requirements	1.1 Prepare and document clear specifications for the project 1.2 Submit specifications to appropriate person for sign-off and authority to contract developers 1.3 Prepare request for tender document if appropriate, using specifications 1.4 Prepare and document agreed selection guidelines
2. Identify potential developers	2.1 Investigate potential developers in line with organisational guidelines 2.2 Request development quotes from potential developers 2.3 Assess submitted quotes against selection guidelines and make a shortlist of potential developers, where appropriate
3. Select a potential developer	3.1 Assess the capability of developers to do the project work 3.2 Confirm that potential developers understand the scope of the work to be undertaken 3.3 Conduct a due diligence check where appropriate and assess the quality of developers 3.4 Select appropriate developers using selection criteria 3.5 Inform developers of their selection according to organisational guidelines
4. Sign off the selection process	4.1 Prepare contract for signing according to enterprise procedures 4.2 Sign contract and prepare developers to commence work according to contract

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.3, 3.1, 3.3	• Interprets and evaluates a range of documentation containing ICT specific terminology and budgetary information to obtain information relating to project requirements and to identify and select developers
Writing	1.1, 1.3, 1.4, 2.3, 3.5, 4.1	• Uses correct spelling and grammar, clear plain English, task related terminology, and a formal document structure, format and style appropriate to the audience and organisation
Oral Communication	1.2, 2.1, 2.2, 3.1-3.3, 3.5, 4.2	• Assumes a formal manner and uses effective listening and questioning techniques to clarify project requirements and elicit information about the capacity, capability and qualifications of developers
Numeracy	1.1, 2.3, 4.1	• Interprets and analyses numerical and budgetary information, and applies mathematical calculations to manage timelines and budgets
Navigate the world of work	2.1, 3.5, 4.1	• Keeps up to date on changes to legislation or regulations relevant to own rights and responsibilities, and considers implications of these when negotiating, planning and undertaking work • Understands how own role meshes with others and contributes to broader work goals
Interact with others	1.2	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 1.3, 1.4, 2.1, 2.3, 3.1, 3.3, 3.4, 4.1	• Uses a combination of formal logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks • Uses systematic, analytical processes in complex situations, gathering relevant information and identifying and evaluating options against a pre-determined set of criteria • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT505 Determine acceptable developers for projects	ICAICT505A Determine acceptable developers for projects	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT505 Determine acceptable developers for projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- specify requirements for a project
- prepare information for tender document and document selection criteria
- seek suitable developer candidates
- select suitable developers
- prepare and implement contracts procedure.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the processes and procedures relating to business liaison
- summarise business negotiation and interview techniques
- outline the process for tendering and writing tenders
- outline the principles and features for preparing contracts
- identify and describe the state and federal legislative requirements and industry standards that relate to:
  - due diligence
  - codes of practice
  - ethics
  - industry and e-commerce standards
  - contracts.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a business plan
- procurement policies
- selection policies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT506 Implement process re-engineering strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to consider a variety of potential process re-engineering strategies and to make appropriate selections for implementation in an organisation.

It applies to individuals who are senior information and communications technology (ICT) staff required to implement system redesign, and administer and manage ICT support in small-to-medium enterprises (SMEs).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop process re-engineering strategies	1.1 Research and determine target process for re-engineering action 1.2 Develop process re-engineering plan 1.3 Determine and document strategic importance of process 1.4 Establish and document performance standards and benchmarks for new process 1.5 Seek feedback and suggestions from client on proposed process re-engineering
2. Implement process re-engineering strategies	2.1 Compare suggestions with process re-engineering plan to determine suitability for business requirements 2.2 Incorporate suggestions where appropriate 2.3 Implement new process into business structure and leave sufficient scope for changing capacity or upgrades
3. Monitor organisational context	3.1 Monitor new process to measure performance levels 3.2 Determine and document benefits of the new process to the business 3.3 Identify and document training needs for staff 3.4 Analyse cultural and political impact of the new process 3.5 Document new process and disseminate information to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2-1.4, 2.1, 3.2, 3.4	• Identifies, analyses and evaluates complex online and hard copy documentation containing specific terminology, diagrams and numerical information to develop process re-engineering strategies and determine the benefits and impact of the process on the business
Writing	1.2-1.5, 2.2, 3.2, 3.3, 3.5	• Uses plain English, appropriate grammatical structures and terminology, diagrams and flow charts, numerical information, and formatting and document structure relevant to the job role and organisation
Oral Communication	1.1, 1.5, 2.3, 3.1, 3.3, 3.5	• Articulates implementation requirements and strategies clearly, using appropriate tone, style, body language and reflective responses • Uses effective listening and questioning techniques to elicit feedback and to ensure understanding of the implementation process has occurred
Numeracy	1.4, 3.1	• Interprets and analyses numerical and budgetary information, and applies mathematical calculations to evaluate the benefits of the process re-engineering on the business
Navigate the world of work	1.4, 2.1, 3.5	• Contributes to roles and responsibilities of self and others • Modifies or develops organisational policies and procedures to comply with legislative requirements and organisation goals
Interact with others	1.5, 3.3-3.5	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Elicits feedback and provides feedback to others in order to improve self or workgroup behaviours
Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.5	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews and changes them to meet new demands and priorities • Applies systematic and analytical decision making

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		processes for complex and non-routine situations • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation and formal and analytical thinking • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT506 Implement process re-engineering strategies	ICAICT506A Implement process re-engineering strategies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT506 Implement process re-engineering strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and document a re-engineering process that supports organisational objectives
- take into consideration the complex interdependencies between organisational and external drivers
- implement a re-engineering process
- monitor and analyse the impact of the process in the organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss business case preparation process and how it can be applied to developing organisational strategies
- identify and summarise relevant laws and standards as they apply to process re-engineering strategies, including:
  - benchmarks
  - copyright
  - intellectual property
  - ethics
  - cultural and political diversity
- outline the impact that new processes may have on an organisation
- outline procedures relating to consulting internally and externally.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a process re-engineering plan
- analysis software
- e-business models
- modelling software
- an organisational strategy
- an organisational structure and culture
- a personal computer (PC)
- stakeholder analysis.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT507 Select new technology models for business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify opportunities for using new technology to support and enable efficient models of business.

It applies to individuals who work as senior information and communications technology (ICT) staff in a range of areas and who are required to research innovative approaches to meeting business requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify processes to be improved by the application of a new business model	1.1 Map existing process flow against relevant performance standards in order to identify areas that may need improvement 1.2 Outline emerging models and processes 1.3 Identify changes in the technological, client and supply chain environment 1.4 Document changes identified and submit to appropriate person for review
2. Appraise existing models	2.1 Analyse existing business models 2.2 Investigate business models in use in other similar businesses 2.3 Identify and determine relevance of business models in use and under development in other industry sectors 2.4 Map existing models in other parts of business supply chain
3. Research new business models	3.1 Investigate new business models to establish opportunities for improvement 3.2 Evaluate opportunities against business requirements 3.3 Prioritise and document identified opportunities
4. Select the appropriate model	4.1 Select a business model that improves the business processes 4.2 Develop performance benchmarks to measure the effectiveness of the chosen business model 4.3 Model new business process or model and collaborate with other businesses 4.4 Document the proposed business model according to business procedures 4.5 Forward appropriate document to relevant person for sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1-2.3, 3.1, 3.2	• Identifies, analyses and evaluates complex text, diagrams, business models and statistical and financial information
Writing	1.1, 1.2, 1.4, 2.4, 3.3, 4.2-4.4	• Integrates information and ideas from a number of sources, utilising appropriate information ICT modelling tools, and specialised and cohesive language and document structures
Oral Communication	1.1, 1.3, 2.1-2.3, 3.1, 3.2, 4.3, 4.5	• Elicits and evaluates information using effective listening and questioning techniques. • Uses simple and relevant language to obtain information, confirm understanding, liaise with the client and appropriate person, and obtain feedback
Numeracy	1.1, 1.4, 2.1, 2.2, 2.4, 3.2, 3.3, 4.2, 4.3	• Interprets and analyses a range of statistical and financial data relating to business models to analyse the current model, identify current and future needs, and develop new technology models
Navigate the world of work	1.1, 3.2, 4.4	• Recognises and responds to both explicit and implicit protocols within familiar work contexts
Interact with others	1.4, 4.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience, and monitoring impact
Get the work done	1.1, 1.3, 2.1-2.4, 3.1-3.3, 4.1-4.3	• Uses systematic analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against organisational requirements • Uses and investigates new digital technologies and applications to manage and manipulate data, and communicate effectively with others in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT507 Select new technology models for business	ICAICT507A Select new technology models for business	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT507 Select new technology models for business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify new approaches to using technology or new technology to enable efficient models of business
- determine the appropriate focus of the selected business model in order to achieve the desired performance improvement
- document a new business model.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify benchmark selection and development
- discuss business process design and include:
  - case diagrams
  - business process model and notation
  - activity diagrams
- discuss business-to-business and business-to-customer interface and liaison
- identify relevant copyright and intellectual property issues
- discuss the current technical environment
- outline methods for the determination of the impact of technological change
- summarise the principles of an electronic commerce modelling language (ECML)
- interpret environmental scanning
- interpret design specifications
- outline modelling methodology
- discuss value and supply chain management
- outline website architecture.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- business systems
- analysis software
- modelling software
- business requirements
- current industry news, forums, lists and chat rooms
- user analysis
- supply and value chain analysis.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT508 Evaluate vendor products and equipment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to evaluate and test a range of vendor products and equipment against a client's business requirements.

It applies to individuals in a range of information and communications technology (ICT) areas who are required to assess hardware and software products.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish business requirements	1.1 Identify and prioritise business requirements 1.2 Identify conflicting or overlapping business requirements 1.3 Specify budget and available resources 1.4 Validate business requirements, budget and resource needs with client
2. Identify vendor products and equipment	2.1 Investigate a representative range of vendor products and equipment 2.2 Identify and document interdependencies 2.3 Specify and document technical alternatives available to the business 2.4 Determine and document availability of products and equipment 2.5 Ensure vendor products and equipment meet Australian or other standards
3. Test vendor products and services	3.1 Develop valid and reliable test regime with appropriate measurements 3.2 Establish test environment, including calibrated measuring equipment 3.3 Undertake testing of products or equipment and document results 3.4 Undertake revised testing where initial tests are inconclusive or where alternative product configuration may meet business requirements
4. Evaluate vendor products, services and equipment	4.1 Rate vendor products for quality, performance and support 4.2 Rate vendor products for fit with client needs 4.3 Establish product limitations, performance, integration capabilities and costs, and compare with established business requirements 4.4 Prepare cost-benefit analysis
5. Prepare evaluation report	5.1 Document product information in order of preference 5.2 Recommend preferred product, including the reasoning

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ELEMENT	PERFORMANCE CRITERIA
	behind recommendations 5.3 Prepare a report containing solution details 5.4 Submit report to client for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 2.2, 2.4, 2.5, 4.1, 4.2	• Identifies, analyses and evaluates highly technical documents, diagrams, business strategies and statistical and financial information
Writing	1.3, 1.4, 2.2-2.4, 5.1, 5.3	• Integrates information and ideas from a number of sources using specialised and cohesive language and formal document structures
Oral Communication	1.1, 1.2, 1.4, 2.1-2.4, 5.4	• Elicits and evaluates information using effective listening and open questioning techniques • Uses simple and relevant language to obtain information, confirm understanding, liaise with the client and obtain feedback
Numeracy	1.1, 1.3, 1.4, 4.3, 4.4, 5.2, 5.3	• Interprets and analyses a range of statistical and financial data relating to products, equipment and integration costs • Uses a range of software tools to apply statistical and financial functions, and prepare a cost-benefit analysis
Navigate the world of work	2.5	• Appreciates the legal and regulatory responsibilities related to own work and recognises some legal principles across work contexts
Interact with others	5.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.1- 2.4, 3.1-3.4, 4.1-4.3	• Develops plans to manage relatively complex non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses systematic, analytical processes in complex non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Actively identifies systems, devices and applications with potential to meet current and/or future needs

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT508 Evaluate vendor products and equipment	ICAICT508A Evaluate vendor products and equipment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT508 Evaluate vendor products and equipment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish business requirements
- evaluate a range of vendor products and equipment against requirements
- test and select the most appropriate products
- document the selected items and selection rationale.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the relevance and application of the following for evaluating and selecting products:
  - code of ethics
  - international standards
  - vendor products
  - client business domain
  - copyright and intellectual property
  - general features and capabilities of current industry accepted hardware and software products
- discuss current and future technical systems considerations required by business
- discuss the features and function of relevant hardware components and software products, and the interaction between them.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- client functional requirements
- hardware and software specifications from vendors
- test procedures and activities.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT509 Gather data to identify business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, analyse and document business requirements.

It applies to individuals working as systems analyst developers and project team leaders, and managers responsible for gathering data to identify business requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify key information sources	1.1 Identify information repositories across the business 1.2 Review current organisational documentation 1.3 Develop critical questions to elicit information from key stakeholders using a mixture of open and closed questions
2. Gather data	2.1 Use a wide range of information gathering techniques 2.2 Review reports and other data sources for business information 2.3 Confirm with stakeholders business critical factors relating to current and future directions of the organisation
3. Prepare data analysis for review	3.1 Analyse group and individual responses to clearly define business priorities 3.2 Document data analysis for review according to organisational standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1-2.3, 3.1	• Identifies, analyses, evaluates and applies complex online and hard copy documentation containing specific terminology, diagrams and numerical information to identify business requirements
Writing	1.3, 2.1, 3.2	• Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing information gathering documentation • Uses vocabulary, grammatical structures, terminology, diagrams, numerical information, formatting and structure relevant to the job role and organisation to document the analysis
Oral Communication	1.1, 2.1-2.3	• Articulates research and resource requirements clearly and directs discussions to elicit the views and opinions of others by using effective listening and open questioning techniques • Uses a range of verbal responses and makes comparisons that show an understanding of topics and concepts
Numeracy	1.2, 2.2, 2.3, 3.1	• Interprets numerical information and applies mathematical calculations and financial functions to analyse financial information
Navigate the world of work	1.2, 3.2	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations
Get the work done	1.1, 2.1- 2.3, 3.1	• Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT509 Gather data to identify business requirements	ICAICT509A Gather data to identify business requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT509 Gather data to identify business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify sources and gather information pertinent to the business requirements
- review and analyse business requirements based on business strategy and current and future directions
- confirm the business critical factors with stakeholders
- prepare data for review
- document data analyse for review according to organisational standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- define the client business domain, so that the business needs are understood by project team and client
- describe the current industry accepted hardware and software products, general features and capabilities suited to the project
- outline the role of stakeholders and the degree of involvement in the process
- specify quality assurance practices required when determining the requirements
- examine the system's current hardware, software and communication functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to a project brief and business documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT510 Determine appropriate ICT strategies and solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse the information and communications technology (ICT) goals, objectives and future requirements for an organisation and determine the best ICT systems solution.

It applies to individuals who administer and manage ICT support and participate in the development of strategic initiatives in small-to-medium enterprises (SMEs).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate ICT needs of the organisation	1.1 Conduct an analysis process that determines the organisation's current needs and projected ICT requirements 1.2 Review the organisational environment and relevant industry changes and trends 1.3 Determine ICT goals, objectives and future requirements 1.4 Prepare information for appropriate person to determine scope with top-level management
2. Contribute to the development of the project goals and objectives	2.1 Determine project scope according to agreed brief 2.2 Align project goals with the ICT goals of the organisation 2.3 Determine impact that system or changes will have on the organisation 2.4 Document project, goals and impact of changes according to requirements
3. Determine best ICT systems solution	3.1 Evaluate a range of ICT systems solutions according to project goals 3.2 Define high-level hardware, software and communications environment necessary for the proposed systems solution 3.3 Develop a feasibility study and a cost-benefit analysis of the proposed solution 3.4 Ensure that the proposed solution aligns with the organisation's strategic plan 3.5 Forward feasibility study and cost-benefit analysis document to appropriate person for approval and sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.3, 3.1, 3.4	• Identifies, interprets and evaluates a wide range of organisational documentation, financial and statistical data, and technical documentation containing complex terminology and diagrams
Writing	1.4, 2.4, 3.2, 3.3	• Uses correct spelling, vocabulary, grammatical structures, ICT specific terminology and document structure relevant to the type of documentation being produced
Oral Communication	1.1-1.3, 2.1- 2.3, 3.1, 3.3, 3.4	• Elicits the views and opinions of others and obtains information by using effective listening and probing, open questioning techniques • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience
Numeracy	1.2-1.4, 2.1-2.4, 3.3	• Interprets and analyses a range of statistical and financial data relating to products, equipment and integration costs • Uses a range of software tools to apply statistical and financial functions, and prepare a cost-benefit analysis
Navigate the world of work	3.4	• With reference to the organisation's strategic plan, understands how own role meshes with others and contributes to broader work goals
Interact with others	3.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.3	• Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to evaluate cost benefits and appropriate solutions • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT510 Determine appropriate ICT strategies and solutions	ICAICT510A Determine appropriate IT strategies and solutions	Updated to meet Standards for Training Packages. Minor edit to title	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT510 Determine appropriate ICT strategies and solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse the organisation's current needs and projected information and communications technology (ICT) requirements
- determine the impact of system changes on the organisation
- evaluate and recommend ICT strategies and systems solutions to meet business objectives
- develop a feasibility study and cost-benefit analysis of proposed solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline two or more current industry systems development methodologies
- summarise the business planning process relevant to the development of an ICT business solution
- outline current business practices for:
  - preparing business reports
  - facilitation of group interviews
- identify and describe quality assurance practices for ICT solutions
- discuss general features and capabilities of current industry accepted hardware and software products
- describe feasibility studies and cost-benefit analyses in relation to ICT strategies and solutions
- identify information sources for a cost-benefit analysis
- summarise the role and degree of stakeholder involvement in development of the ICT strategy
- describe specific client business requirements in relation to proposed ICT solutions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where ICT strategies and solutions may be developed
- detailed information relating to current needs and project requirements of the business
- outcomes of the business analysis process
- client expectations brief
- business risks and objectives
- a range of ICT business solutions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT511 Match ICT needs with the strategic direction of the enterprise

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure information and communications technology (ICT) services meet current and future internal operational enterprise requirements.

It applies to individuals whose responsibilities may include maintaining and supporting critical infrastructure for objectives in small-to-medium sized organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate current business strategy	1.1 Analyse current strategic plan of the organisation to understand the industry environment and current organisational goals 1.2 Compare information related to current operational practices and the strategic plan to determine possible ICT gaps and improvement opportunities 1.3 Report information regarding the effect of ICT developments to an appropriate person
2. Evaluate effect of changes	2.1 Review information on current ICT systems supported by the organisation 2.2 Compare and document advantages and disadvantages of current and proposed ICT systems 2.3 Determine the objectives and implications of introducing changes 2.4 Document findings and forward to appropriate person for feedback
3. Develop action plans	3.1 Develop plans to implement proposed changes according to organisational policy and procedures 3.2 Document action plans, ensuring that standards, targets and implementation methods are detailed 3.3 Forward documentation to appropriate person for feedback and approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2	• Reviews, analyses and evaluates complex online and hard copy documentation containing ICT specific terminology, diagrams and numerical information to determine ICT gaps and improvement opportunities
Writing	1.3, 2.2, 2.4, 3.1, 3.2	• Uses plain English, together with vocabulary, grammatical structures, terminology, diagrams, numerical information, formatting and structure relevant to the job role and organisation
Oral Communication	1.3, 2.3, 3.1	• Uses plain English, translating technical terminology when necessary, to communicate with a range of personnel and determine objectives, articulate ideas and requirements, and develop plans • Elicits information using effective listening and questioning techniques
Numeracy	1.1, 1.2, 2.2, 2.3, 3.1	• Interprets numerical data and applies mathematical calculations to assess the financial implications of introducing changes
Navigate the world of work	1.1, 3.1	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation • Seeks to improve policies and procedures to better meet organisational goals
Interact with others	1.3, 2.4, 3.3	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Collaborates with others sharing information to build strong work groups and avoid behaviours that are not conducive to a productive environment
Get the work done	1.1-1.3, 2.2, 2.3, 3.1	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision making processes for complex and non-routine situations • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation and formal and analytical

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		thinking • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others in a secure and stable digital environment

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT511 Match ICT needs with the strategic direction of the enterprise	ICAICT511A Match IT needs with the strategic direction of the enterprise	Updated to meet Standards for Training Packages. Minor edits to title and to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT511 Match ICT needs with the strategic direction of the enterprise

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- access and analyse relevant information on changes to technology and resources
- analyse strategic plans to determine future technology needs
- monitor resource use and cost-efficiency and effectiveness of technology
- develop and document action plan detailing standards, targets, timelines and implementation methods.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify methods of analysis and planning approaches to technical problems and management requirements
- assess and document the hardware platform used by the organisation and network, and the subsequent security guidelines required
- explain current system functionality to forecast for planning
- identify and specify operating systems supported by the organisation to forecast for planning
- compare competing and complementary internal and external operating environments
- identify and assess technology and product directions for evaluating and forecasting vendor and technology trends.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a site where ICT needs and strategic directions of the enterprise may be coordinated
- detailed information relating to abusiness strategic plan
- information on a range of ICT business solutions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT512 Plan process re-engineering strategies for business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select a process to be re-engineered, to plan for its re-engineering, and to understand the strategic, organisational and change context in which it is to be re-engineered.

It applies to individuals working in senior positions in the knowledge management or systems development field who are required to evaluate existing organisational workflows and processes with a view to redesigning them to achieve a defined business outcome.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select the process to be re-engineered	1.1 Identify major processes that require re-engineering 1.2 Identify boundaries, stakeholders and strategic importance of each process 1.3 Prioritise each process according to its level of performance 1.4 Select a process to re-engineer and document the decision making process
2. Identify the strategic context	2.1 Determine purpose of the selected process and where it fits into the business strategy 2.2 Evaluate the scope of the process, including stakeholder and strategic impact 2.3 Identify potential risks 2.4 Define broad objectives of the new process 2.5 Model the new process, taking into account client expectations, cooperation across boundaries and process flow 2.6 Analyse changes to organisational structures, technical requirements, training needs, cultural and political impact and communication channels 2.7 Document new process and impact of changes
3. Design the new process	3.1 Develop key performance indicators and implementation responsibilities for the new process 3.2 Communicate information to appropriate person 3.3 Prepare a process re-engineering plan to document stages 3.4 Submit process re-engineering plan to appropriate person for sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1-2.3, 2.6	• Identifies, analyses and evaluates complex online and hard copy documentation containing specific terminology, diagrams and numerical information
Writing	1.4, 2.5, 2.7, 3.3	• Uses plain English, appropriate grammatical structures and terminology, diagrams and flow charts; numerical information; and formatting and document structure relevant to the job role and organisation
Oral Communication	1.1, 1.2, 1.4, 2.1, 2.3, 2.5, 3.2, 3.4	• Articulates research and resource requirements clearly and directs discussions to elicit information and the views and opinions of others by using effective listening and open questioning techniques • Uses a range of verbal responses and makes comparisons that show an understanding of topics and concepts
Numeracy	1.3, 1.4, 2.2, 2.3, 2.5-2.7	• Interprets numerical information and applies mathematical calculations and financial functions to analyse financial information
Interact with others	3.2, 3.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.4, 2.1-2.6, 3.1	• Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to determine appropriate solutions • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT512 Plan process re-engineering strategies for business	ICAICT512A Plan process re-engineering strategies for business	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT512 Plan process re-engineering strategies for business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document the re-engineering selection and decision making process
- prepare an analysis, documenting the impact of changes to the organisation
- plan the re-engineering of the process in a manner that supports the strategic, organisational and change context of the process to be re-engineered
- design the new process, including key performance indicators and implementation responsibilities
- prepare a process re-engineering plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and summarise copyright and intellectual property implications
- discuss and explore e-commerce and industry standards pertinent to business strategies
- describe the process required for organisational development and structure
- summarise the organisational strategy development process
- describe the stakeholder liaison and negotiation process.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- an organisational structure and culture
- an organisational strategy
- stakeholder analysis
- e-business models
- a personal computer (PC)
- analysis software and modelling software currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT514 Identify and manage the implementation of current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to demonstrate and constantly review work processes that ensure that the quality of the business process is maintained for the implementation of specific industry technologies at an identified industry standard.

It applies to individuals engaged in ongoing review and research in order to identify, manage and evaluate the implementation of industry technologies or techniques to improve aspects of the organisation's activities.

Work functions in the occupational areas where this unit may be used are subject to regulatory requirements. Refer to the ICT Implementation Guide Companion Volume or the relevant regulator for details of licensing, legislative or certification requirements.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse and plan the implementation of industry specific technologies	1.1 Identify technologies specific to an industry sector 1.2 Acquire industry specific technologies and analyse their relevance to organisational requirements 1.3 Plan the implementation of industry specific technologies where appropriate for the benefit of the organisation
2. Manage the application of industry specific technology to assist in solving specific organisational problems	2.1 Manage the testing of industry specific technology 2.2 Manage the implementation of specific features and functions of industry specific technology to provide a suitable solution to an identified problem 2.3 Demonstrate depth of knowledge of enabling technologies to an accepted industry standard 2.4 Access and use sources of information relating to the industry specific technology
3. Review, analyse and evaluate industry specific technology performance	3.1 Analyse implementation of the industry specific technology for performance and usability 3.2 Review and evaluate the benefits to the organisation 3.3 Determine environmental considerations involved with using the technology 3.4 Seek feedback from users where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.4, 3.2-3.4	• Identifies and interprets technical online and hard copy documentation containing complex terminology and diagrams to identify industry specific technologies that will benefit the organisation
Writing	1.3, 3.1, 3.4	• Uses vocabulary, grammatical structures and terminology and document structure relevant to the job role and organisation • Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing feedback gathering documentation
Oral Communication	1.1-1.3, 2.1, 2.2, 2.4, 3.1-3.4	• Uses clear, easy-to-understand language, translating industry specific terminology into plain English, together with effective listening and open, probing questioning techniques
Navigate the world of work	3.3	• Keeps up to date on changes to legislation or regulations relevant to own rights and responsibilities, and considers implications of these when planning work
Get the work done	1.1-1.3, 2.1-2.4, 3.1, 3.2	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Actively identifies systems, devices and applications with potential to meet current and future needs

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT514 Identify and manage the implementation of current industry specific technologies	ICAICT514A Identify and manage the implementation of current industry specific technologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT514 Identify and manage the implementation of current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and critically evaluate features and functions of identified industry specific technologies to an industry standard
- manage the implementation of new and emerging industry specific technologies
- review the performance of the industry specific technologies for the organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the trends and applications of current vendor products and technologies
- outline the various techniques for gathering information
- discuss the current directions of information and communications technology (ICT) and specifically of the major industry technology standards used in the specified area
- summarise the general features, capabilities and application of current industry hardware and software products.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where industry specific technologies may be used
- industry specific technologies currently used in industry
- documents detailing work health and safety (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT515 Verify client business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to deal with clients at a senior level, to identify their business requirements and verify the accuracy of the information gathered.

It applies to individuals who are senior information and communications technology (ICT) personnel operating with a high degree of autonomy for managing activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish business relationship	1.1 Identify organisational structure, culture and politics in relation to support requirements 1.2 Identify organisational stakeholders 1.3 Develop business relationship with client across the appropriate number of organisational units 1.4 Schedule regular liaison to manage relationship
2. Determine context of business need or problem	2.1 Work with client to define the business problem to be investigated 2.2 Establish system boundaries and scope 2.3 Manage preparation of appropriate information gathering 2.4 Ensure that project objectives and outcomes are documented 2.5 Work with client to substantiate documentation
3. Analyse new information	3.1 Supervise information gathering from identified clients of the system 3.2 Analyse gathered client responses 3.3 Analyse new system requirements 3.4 Ensure that new system requirements and problems are documented
4. Confirm system specifications	4.1 Review documentation 4.2 Work with client to verify system specifications, updating documentation as required 4.3 Obtain final approval and sign-off from client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.3, 2.5, 3.2, 3.3, 4.1	• Identifies, analyses and evaluates complex and technical online and hard copy documentation containing specific terminology, diagrams and numerical information to identify organisational requirements, analyse business problems and identify solutions
Writing	1.4, 2.3-2.5, 3.4, 4.2	• Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing information gathering documentation • Uses plain English, appropriate grammatical structures and terminology, diagrams and flow charts, numerical information, and formatting and document structure relevant to the job role and organisation to record new system requirements and associated risks
Oral Communication	1.1-1.3, 2.1, 2.2, 2.5, 3.1, 4.2, 4.3	• Elicits the view and opinions of others and obtains information by listening and questioning • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience • Articulates requirements and strategies clearly, using appropriate tone, style, body language and reflective responses to build business relationships
Numeracy	2.2-2.5, 3.3, 4.2	• Interprets numerical information and applies mathematical calculations relating to time durations and budgetary information
Interact with others	1.3, 4.3	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 1.2, 1.4, 2.2, 2.3, 3.2, 3.3	• Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to evaluate appropriate solutions • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work

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		processes, create opportunities and reduce risks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT515 Verify client business requirements	ICAICT515A Verify client business requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT515 Verify client business requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish business relationship through investigation of the organisation and interviews with client and staff
- determine and document business expectations and needs, including critical business requirements
- work with clients and staff to gather, analyse and confirm information contributions
- review and gain approval for system specifications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the process of communicating with the client in order to gather and report data
- provide an overview of the client business to enable informed information and communications technology (ICT) product selection
- describe the process used to identify products related to the business
- outline the role of stakeholders and the degree of stakeholder involvement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- current business needs
- client expectations brief
- business objectives
- systems, data gathering and appropriate software products.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT601 Develop ICT strategic and action plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create strategic and action plans in alignment with organisational information and communications technology (ICT) goals and strategies.

It applies to individuals who work as senior ICT staff and who are required to develop strategies and action plans for implementation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop and communicate mission and vision statement	1.1 Develop a mission statement for the organisation that states the purpose, values and business activities 1.2 Develop a vision statement for the organisation that describes its future operation and success 1.3 Develop the mission and vision statements in active consultation with team members and management 1.4 Document mission and vision statements 1.5 Communicate mission and vision statement to stakeholders and other authorities in the organisation
2. Examine organisational environment	2.1 Assess the current internal situation of the organisation, taking into account its strengths and weaknesses 2.2 Assess the external environment of the organisation, taking into account opportunities and threats 2.3 Determine trends and developments impacting on the strategic direction of the organisation 2.4 Determine critical issues facing the organisation 2.5 Document strengths, weaknesses, opportunities, threats (SWOT) and critical issues facing the organisation in the strategic plan
3. Set objectives and targets	3.1 Use critical issues to develop objectives and targets for the organisation after active consultation with team members and management 3.2 Develop strategies that meet organisational objectives and reflect overall organisational mission and values 3.3 Ensure strategies are obtainable, realistic and able to meet basic mission critical parameters 3.4 Determine constraints associated with the strategies and objectives developed 3.5 Include strategies, objectives and constraints in strategic plan documentation
4. Develop action plans	4.1 Develop action plans for the strategies and objectives in consultation with team members and management 4.2 Check that action plans have clear, comprehensive and

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ELEMENT	PERFORMANCE CRITERIA
	concise details 4.3 Check that action plans are adhered to 4.4 Include action plans in strategic plan documentation
5. Review and implement strategic plan	5.1 Review strategic plan with stakeholders and management 5.2 Incorporate changes and improvements as recommended 5.3 Implement action plans as set out in the strategic plan 5.4 Review and evaluate success of strategic plan after action plans have been implemented

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1-2.4, 3.4, 4.2, 5.1, 5.4	• Identifies, analyses and evaluates complex text, diagrams, business models, industry trends, statistical information and financial information
Writing	1.1-1.4, 2.5, 3.1, 3.2, 3.5, 4.1, 4.4, 5.2	• Integrates information and ideas from a number of sources, utilising appropriate strategic planning tools, specialised and cohesive language and formal document structures
Oral Communication	1.1-1.3, 1.5, 2.1-2.4, 3.1, 3.2, 3.4, 4.1, 4.3, 5.1, 5.3, 5.4	• Elicits the view and opinions of others and obtains information by using effective listening and probing, open questioning techniques • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience • Articulates requirements and strategies clearly, using appropriate tone, style, body language and reflective responses
Numeracy	2.1--2.5, 3.2-3.4, 4.1, 5.3	• Uses a range of statistical, mathematical and financial calculations and functions to interpret numerical data relating to SWOT analysis and time and financial constraints
Navigate the world of work	2.5, 3.2, 5.3	• Takes a lead role in the development of organisational goals, roles and responsibilities • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met
Get the work done	1.1-1.3, 2.1- 2.5, 3.1-3.4, 4.1, 4.3, 5.3, 5.4	• Recognises the critical importance of clarifying, focusing and aligning goals and expectations, and may use the process to build ownership of and broad commitment to achieving outcomes • Identifies a range of factors that impact on a decision, including own values and principles, the needs, power, values, beliefs and assumptions of stakeholders • May intuitively hone in on problem areas and identify a small set of possible and appropriate solutions • Applies systematic thinking techniques as an integral part of the creative process, recognising

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		the need to challenge habitual perceptions, break patterns and make new connections in order to escape from habitual mindsets • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT601 Develop ICT strategic and action plans	ICAICT601A Develop IT strategic and action plans	Updated to meet Standards for Training Packages. Minor edits to the title and to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT601 Develop ICT strategic and action plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop mission and vision statements in consultation with team members and management
- conduct a strengths, weakness, opportunities and threats (SWOT) analysis
- develop strategic directions and action plans determined by the strategic alignment of information and communications technology (ICT) directions with organisational goals
- review strategic plan and incorporate changes and improvements
- implement action plans
- evaluate strategic plans following implementation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss analysis and planning approaches to technical problems and management requirements relating to network ICT security guidelines of the organisation
- explain how to conduct a SWOT analysis
- outline the organisation's approach to:
  - developing action plans
  - monitoring strategic directions
  - setting objectives and targets
  - selecting hardware platform
- outline technology and product directions
- discuss evaluation methods used when forecasting for planning:
  - current system functionality, particularly with regard to ICT trends and developments
  - internal and external operating environments
  - operating systems supported by the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- the organisation's strategic plan
- budget and time constraints
- business objectives
- business risks
- information on a range of ICT business solutions
- outcomes of the business analysis process.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT602 Develop contracts and manage contracted performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to negotiate and document contractual arrangements between clients and vendors, and to monitor and manage performance against agreed contractual obligations.

It applies to individuals who work in senior information and communications technology (ICT) management roles who are required to contract both staff and suppliers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish contract	1.1 Determine boundaries of the contract 1.2 Document contract details and provide a copy to the client and vendor for review 1.3 Obtain client and vendor feedback to clarify problems and misunderstandings 1.4 Facilitate negotiations to resolve problems and misunderstandings 1.5 Seek agreement from stakeholders
2. Monitor contract	2.1 Monitor performance against contractual obligations to ensure desired level of quality is maintained 2.2 Ascertain client satisfaction with contractual performance 2.3 Identify and take action to address unsatisfactory performance 2.4 Provide recommendations for contractual variations, if required 2.5 Forward recommendations to appropriate person for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.3	• Identifies and analyses a variety of organisational documentation, vendor and client information, technical specifications and financial data
Writing	1.2, 2.4	• Integrates information and requirements from a number of sources using correct spelling and grammar, specialised and cohesive language, and formal contract documentation structures
Oral Communication	1.1, 1.3-1.5, 2.1-2.5	• Uses effective listening and probing, and open questioning techniques to elicit the views and opinions of others and obtain information and feedback • Articulates requirements clearly in plain English and uses appropriate tone, style, body language and reflective responses to interact effectively, remedy issues and disagreements, and negotiate outcomes
Numeracy	1.1-1.3, 2.1, 2.3, 2.4	• Uses a range of mathematical and financial calculations to determine and monitor contractual milestones, costs and budgetary constraints
Interact with others	1.2, 2.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 1.4, 2.1, 2.3	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses systematic analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention on critical issues and variables and filtering out peripheral issues • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT602 Develop contracts and manage contracted performance	ICAICT602A Develop contracts and manage contracted performance	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT602 Develop contracts and manage contracted performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- negotiate and formulate contracts
- access and analyse relevant information on resources and budgets
- analyse current and future contract requirements
- monitor resource use, cost efficiency and effectiveness against contractual obligations
- review objectives and performance measures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the analysis and planning approaches to technical problems or management requirements, taking into account:
  - organisational values
  - purpose in the context of formulating contracts
- outline methods for evaluating and forecasting vendor and technology trends
- discuss contracting requirements related to information and communications technology (ICT)
- describe methods of purchasing ICT equipment and services, such as negotiating extensive client support contracts
- outline industry standards in relation to service and product agreements.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- detailed information relating to business strategic plan
- budget constraints
- timeframe for the strategic plan
- business objectives
- information on a range of ICT business solutions
- outcomes of a business analysis process.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT603 Manage the use of appropriate development methodologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to nominate the most appropriate traditional or non-traditional systems development methodologies for use by a team.

It applies to individuals who work in senior information and communications technology (ICT) management roles and are required to manage development teams.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine and select appropriate development methodology for a given activity	1.1 Determine and define subject activity 1.2 Define criteria for selection of development methodology 1.3 Review and evaluate with project leader a range of traditional and non-traditional system development methodologies 1.4 Select appropriate system development methodology to suit the activity 1.5 Brief project team on selected methodology
2. Direct the use of the selected development methodology	2.1 Review the initial project plan to guide developmental processes 2.2 Review the identification of appropriate task types according to development methodology 2.3 Review the description and articulation of task types 2.4 Review the definition of appropriate control structures that need to be created during task type execution 2.5 Review the identification of resources to support methodology selection 2.6 Monitor the application of appropriate methodology to solve tasks 2.7 Monitor the project flow and effectiveness of use of methodology against project plan 2.8 Review the documented opportunities for improvement, lessons learned and recommendations for future projects

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.5, 2.8	• Identifies, analyses and evaluates a range of online and hard copy organisational documentation and technical information containing complex, systems development specific terminology, syntax and diagrams and applies the information to the task
Writing	1.1-1.3, 2.1-2.5	• Uses correct spelling, grammar and plain English together with a range of systems development specific terminology and computer generated diagrams
Oral Communication	1.1, 1.3-1.5, 2.1-2.8	• Elicits and evaluates information using project related terminology and effective listening and questioning techniques • Uses specific and complex systems development terminology to liaise with project leader, review methodology and monitor the project
Interact with others	1.3	• Identifies relevant information and ideas from a range of messages and oral and written exchanges, paying some attention to the meanings attached to the choice of form, channel and wording
Get the work done	1.1, 1.2, 1.4, 2.1-2.7	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses systematic analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT603 Manage the use of appropriate development methodologies	ICAICT603A Manage the use of appropriate development methodologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT603 Manage the use of appropriate development methodologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- manage a project team
- review a project plan
- supervise the application of a methodology to a project
- evaluate a range of development methodologies and their application to a project or scenario
- review documentation as required by the chosen methodology.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline and analyse the client business domain and organisational requirements
- discuss the life cycle maintenance of a live system, network or website
- describe the role of stakeholders and the degree of stakeholder involvement in the development process
- identify and discuss the technology requirements involved for a range of development methodologies
- discuss two or more current industry development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- design specifications and current development methodologies
- organisational standards for documentation and version control
- detailed user requirements document, including model and scope
- a project plan.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT604 Identify and implement business innovation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse traditional business processes to identify and implement business opportunities for innovation and reform.

It applies to individuals in senior information and communications technology (ICT) roles within organisations, in the areas of knowledge management and systems development, who are responsible for analysing, identifying and coordinating relevant ICT business solutions to meet given organisational goals.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Compare the business with competitor businesses	1.1 Investigate information on business markets, customers and methods of doing business 1.2 Analyse and compare the current market for the business and the customer base with typical business markets and customers 1.3 Analyse and contrast current business relationships, business processes and methods of doing business with e-facilitated businesses
2. Identify business opportunities for innovation and reform	2.1 Investigate innovation and reform of aspects of the business through business strategies 2.2 Assess opportunities for their compatibility with business goals and objectives, and conduct a cost-benefit analysis for each 2.3 Evaluate the degree of likely change and the ramifications for the business and its culture for each opportunity 2.4 Conduct a risk management analysis and formulate a plan for dealing with contingencies according to organisational requirements 2.5 Rank opportunities in terms of their viability and applicability to the organisation 2.6 Include opportunities for innovation in the organisation's business strategy and prioritise them for implementation
3. Implement innovation	3.1 Redesign aspects of the business in an innovative manner using online technologies according to the organisation's business strategy 3.2 Integrate innovation into the business and monitor to gauge usefulness and maximise implementation 3.3 Review business innovation in consultation with users and make recommendations for improvement or further innovation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Identifies, analyses and evaluates complex textual information to obtain information relevant to the organisation and the development of the innovative reforms
Writing	3.3	• Integrates information and ideas from a number of sources, utilising appropriate strategic planning and business innovation tools, specialised and cohesive language and formal document structures to meet the varied requirements of the organisation and the stakeholders
Oral Communication	3.3	• Elicits the views and opinions of others and obtains information by using effective listening and probing open questioning techniques • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience • Articulates requirements and strategies clearly, using appropriate tone, style, body language and reflective responses
Numeracy	2.2	• Uses a range of statistical, mathematical and financial calculations and functions to interpret numerical data relating to cost-benefit analysis and risk and time constraints, and to monitor implementation of the reform
Navigate the world of work	2.4	• Recognises and responds to both implicit and explicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations
Get the work done	1.1-1.3, 2.1-2.6, 3.1, 3.2	• May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, identifying and addressing issues • Uses analysis, lateral thinking, experience and knowledge to address complex problems • Reflects on the ways in which variables impact on decision outcomes • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work

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		processes, create opportunities and enhance or reduce risks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT604 Identify and implement business innovation	ICAICT604A Identify and implement business innovation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT604 Identify and implement business innovation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define the organisation's strategic directions
- develop innovations to assist the business
- produce a cost-benefit analysis of suggested innovations
- develop an implementation plan for the innovations.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the culture of the business versus traditional business models
- identify internal and external sources of information
- outline legal, ethical and security issues relating to business strategies
- outline records management principles
- identify relevant legislation from levels of government that effect business operation, especially regarding workplace health and safety (WHS) and environmental issues, equal opportunity, industrial relations and anti-discrimination
- outline the structure of the business.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a range of business documents covering vision, mission statements and strategic directions
- a site where business opportunities for innovation may be implemented.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT605 Implement a knowledge management strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement, monitor and review knowledge management strategies.

It applies to individuals who work in senior information and communications technology (ICT) roles in knowledge management and systems development teams.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement knowledge management system and procedures	1.1 Foster a culture of sharing knowledge within the business through a system of formal and informal incentives and rewards 1.2 Implement policy and procedures for capturing knowledge within the organisation according to the business knowledge management strategy, and integrate this knowledge into existing business processes to change the enterprise processes 1.3 Model methods of contributing to the organisation's knowledge management system, and provide learning and development opportunities for staff to assist them to contribute and provide feedback 1.4 Provide coaching, mentoring and ongoing support to staff in accessing and using the organisation's knowledge management system according to the business knowledge management strategy 1.5 Manage protection and security of knowledge or information and levels of access according to organisational requirements
2. Maintain business knowledge base	2.1 Monitor input procedures to ensure that sources are tapped and knowledge is captured according to the business knowledge management strategy, and to ensure the effectiveness of accurate data capture 2.2 Collect and analyse data on access and use of the knowledge management system to determine the organisation's strategic use of knowledge 2.3 Implement contingency measures to address shortfalls in the knowledge management system and procedures, according to level of responsibility and authority
3. Review knowledge management system and procedures	3.1 Evaluate the knowledge management system and procedures to ensure they meet the needs of clients, organisational aims, objectives and standards 3.2 Periodically review the organisational knowledge content for accuracy and currency to ensure that it remains in line with organisational requirements 3.3 Identify improvements to the system and to the organisation's strategic use of knowledge in consultation with users, and prepare a cost-benefit analysis with

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ELEMENT	PERFORMANCE CRITERIA
	recommendations

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 3.1, 3.2	• Critically evaluates a wide variety of textual information to ensure current accuracy of knowledge bank
Writing	1.3, 3.1, 3.3	• Integrates information and ideas from a number of sources using clear, logical document structures, relevant terminology and correct grammatical structures
Oral Communication	1.1–1.5, 2.1–2.3, 3.1–3.3	• Elicits the view and opinions of others and obtains information by using effective listening and probing open questioning techniques • Participates in a verbal exchange of ideas/solutions and uses detailed and clear language to clarify and present information according to requirements and audience • Articulates requirements and strategies clearly, and obtains information by using the appropriate pitch and tone of voice, encouraging body language and reflective responses
Numeracy	2.1, 2.2, 3.1, 3.3	• Uses a range of statistical, mathematical and financial calculations and functions, and relevant software tools to interpret data, review knowledge bank efficiency and develop a cost-benefit analysis
Navigate the world of work	1.2, 1.5	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to workplace policies and procedures
Interact with others	1.1, 1.4	• Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking leadership role on occasion
Get the work done	1.3, 1.5, 2.1-2.3, 3.1, 3.2	• May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, identifying and addressing issues • Uses each experience to reflect on the ways in which variables impact on decision outcomes • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of

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		constraints into account • Recognises critical importance of the ongoing exploration of new ideas to the viability and effectiveness of a work situation • Considers strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • May intuitively hone in on problem areas and identify a small set of possible appropriate solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT605 Implement a knowledge management strategy	ICAICT605A Implement a knowledge management strategy	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT605 Implement a knowledge management strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- recognise the need for a knowledge management system in a contemporary organisation
- develop and implement a knowledge management system
- manage culture change in the management of knowledge
- review and improve systems and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the importance of knowledge management in a contemporary organisation
- discuss the difference between the business culture and the business model
- outline database design concepts for management knowledge
- identify and quantify internal and external sources of information
- discuss legal, ethical and security issues relating to knowledge management
- describe records management principles
- determine relevant legislation from levels of government that effect business operation, including:
  - workplace health and safety (WHS)
  - environmental issues
  - equal opportunity
  - industrial relations
  - anti-discrimination
- outline the structure of the business and its relationship to knowledge management.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- sample organisations and their structure, goals and knowledge requirements
- organisational business plans
- existing knowledge management strategies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT606 Develop communities of practice

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify areas that would benefit from communities of practice (CoPs), and to develop such communities.

It applies to individuals who work in senior information and communications technology (ICT) management roles and are responsible for teams and their production.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify requirement for community of practice	1.1 Map organisational knowledge 1.2 Identify existing informal communities of practice (CoPs) 1.3 Identify situations where staff will benefit from closer cooperation across organisational boundaries 1.4 Identify those in disparate areas that share work goals
2. Devise spaces for involvement	2.1 Enable electronic meeting spaces 2.2 Enable shared storage areas, both public and private 2.3 Enable group mailing capability 2.4 Enable other appropriate technical facilitators
3. Invite participation	3.1 Publicise collaborative tools 3.2 Invite staff in areas identified above to group events, such as training and conferences 3.3 Allow new groups to coalesce spontaneously 3.4 Accept different levels of participation
4. Assist evolution of community	4.1 Facilitate regular contact within CoPs 4.2 Enable evolution of CoPs, including the disbanding of a CoP where its purpose has been achieved

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4	• Identifies and reviews a wide variety of text sourced from organisational documentation, electronic meeting places and the organisational knowledge bank to determine relevant and key information
Writing	1.1, 3.1, 3.2, 4.1, 4.2	• Uses persuasive writing, correct spelling, appropriate grammatical structures and a broad range of vocabulary, including idioms, colloquialisms and technical terminology, and applies document structures suitable to the document type
Oral Communication	1.1-1.4, 3.1, 3.2, 4.1, 4.2	• Elicits the view and opinions of others and obtains information by using effective listening and probing open questioning techniques • Uses the appropriate pitch and tone of voice, encouraging body language, reflective responses, plain English and a courteous manner when encouraging participation and facilitating CoPs
Interact with others	3.2-3.4, 4.1	• Fosters a collaborative culture within own sphere of influence, facilitating a sense of commitment and cohesion, and highlighting and using the strengths of those involved
Get the work done	1.1-1.4, 2.1-2.4, 4.2	• Takes responsibility for defining key aspects of own workload, balancing own needs and priorities with those of the work group • Actively identifies, creates and utilises linkages to enhance knowledge sharing, idea creation, individual and collective engagement and work outcomes • Actively identifies systems, devices and applications with potential to meet current and future needs

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT606 Develop communities of practice	ICAICT606A Develop communities of practice	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT606 Develop communities of practice

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and map appropriate areas for communities of practice (CoPs) for an organisation
- identify and manage the provision of enabling methodologies
- foster and encourage participation in CoP
- facilitate the development of CoP.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- define 'communities of practice' and describe their purpose in an organisation
- outline organisational structures, goals and knowledge, and how they apply to CoPs
- identify and compare communications enabling technologies
- discuss group dynamics and its impact on building CoPs
- describe techniques to promote, market and engage with CoPs and the enabling technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- an organisational structure, goals and knowledge
- a site where CoP may be developed.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT608 Interact with clients on a business level

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to interact with clients at a management level.

It applies to individuals working as management personnel in a range of information and communications technology (ICT) areas who are responsible for maintaining client relationships.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review client's business domain	1.1 Research organisational service standards, values and culture to understand the organisational environment 1.2 Investigate and document the goods and services provided by the organisation 1.3 Review current service level agreements (SLAs) if appropriate
2. Develop new business with client	2.1 Research client service needs and preferred level of service 2.2 Research opportunities for new business with client 2.3 Develop draft proposals to cover these new initiatives
3. Negotiate new business initiatives	3.1 Conduct a session with the client to present the new opportunities 3.2 Present proposals to the client in a clear, concise and comprehensive manner 3.3 Present proposed cost and timeframes to the client 3.4 Negotiate terms with the client and record alterations if required 3.5 Clarify areas of uncertainty or disagreement 3.6 Document agreement negotiated with the client
4. Monitor, adjust and implement procedures to maintain client focus	4.1 Assess progress in achieving new client initiatives 4.2 Gather client feedback to improve the proposals 4.3 Adjust service provided to the client based on client feedback and in line with organisational guidelines 4.4 Document changes to new provisions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 2.2, 4.1, 4.2	• Identifies, analyses and evaluates a range of complex information to identify relevant and key information
Writing	2.3, 3.6, 4.4	• Uses plain English, appropriate grammatical structures and specialised terminology, diagrams and flow charts, logical document structures and formatting relevant to the job role and organisation to record document proposals and agreements
Oral Communication	1.1-1.3, 2.1, 2.2, 3.1-3.5, 4.1, 4.2	• Uses open questioning and effective listening techniques to elicit information, clarify requirements and conduct effective negotiations • Uses appropriate vocabulary, grammatical structure, voice tone, body language and reflective responses to build business relationships and present proposals
Numeracy	1.2, 1.3, 2.3, 3.3-3.5, 4.3, 4.4	• Interprets numerical information and applies mathematical calculations and financial functions relating to time durations and projected costs
Navigate the world of work	1.3, 4.3	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to organisational procedures
Interact with others	3.1, 3.2, 3.4	• Invests considerable time and energy in building and maintaining effective working relationships within and beyond immediate work context, recognising and intuitively responding to the subtle and complex mix of factors at play in every interaction
Get the work done	1.1, 1.2, 2.1-2.3, 4.1	• Takes responsibility for defining key aspects of own workload, balancing own needs and priorities with new opportunities • Makes decisions quickly and intuitively in familiar situations requiring immediate attention, drawing on past experience to identify key variables, consider possible implications of different courses of action and determine the best course of action • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Demonstrates a sophisticated understanding of expectations, social protocols and online etiquette,

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		intuitively selecting the appropriate channel, content and tone for diverse purposes and audiences

New Topic (129)

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT608 Interact with clients on a business level	ICAICT608A Interact with clients on a business level	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT608 Interact with clients on a business level

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assemble a proposal for a new business initiative
- develop a strong awareness of the clients business
- present and negotiate a proposal with the client
- formulate and implement new business
- monitor and maintain client relationship and requirements of service.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss business practices relevant to understanding client needs, including:
  - change management
  - information gathering techniques
  - planning process, including development of information and communications technology (ICT) business solutions
  - preparation of reports
- identify current industry accepted hardware and software products relevant to client services and support, including:
  - general features and capabilities
  - vendor product directions
- identify and interpret legal principles of commercial contracts and service level agreements (SLAs)
- interpret organisational policies, plans and procedures, including contracting
- summarise the concepts of negotiation and the process for building business relationships.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- organisational policies, procedures and SLAs for the ICT industry
- contexts for negotiating agreements and contracts
- current ICT hardware and software products.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT609 Lead the evaluation and implementation of current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead the identification, management and implementation of specific industry technologies to meet identified industry standards.

It applies to individuals who work in senior information and communications technology (ICT) leadership roles and are engaged in ongoing review and research to improve aspects of the organisation's activities.

Check the Implementation Guide Companion Volume for details about licensing, legislative or certification requirements.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Lead the implementation of industry specific technologies	1.1 Identify technologies specific to an industry sector 1.2 Determine relevance of industry specific technologies to organisational requirements 1.3 Plan implementation of industry specific technologies where appropriate, for the benefit of the organisation
2. Direct the application of industry specific technologies to assist in solving specific organisational problems	2.1 Lead management of testing of industry specific technology 2.2 Direct implementation of specific features and functions of industry specific technologies to provide a suitable solution to an identified problem 2.3 Demonstrate depth of knowledge of enabling technologies to an accepted industry standard 2.4 Access and use sources of information relating to industry specific technologies
3. Lead the review, analysis and evaluation of the industry specific technology performance	3.1 Lead analysis of the implementation of the industry specific technologies for performance and usability 3.2 Analyse, review and evaluate the benefits to the organisation 3.3 Determine environmental considerations involved with using the technology 3.4 Seek feedback from users where appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.3, 2.4, 3.1-3.4	• Identifies and interprets technical online and hard copy documentation that will enable the organisation
Writing	1.3, 3.2, 3.4	• Uses vocabulary, grammatical structures, specific terminology and document structure relevant to the job role and organisation • Uses plain English and appropriate questioning strategies, avoiding loaded or leading questions, when developing feedback gathering documentation
Oral Communication	1.1-1.3, 2.1-2.4, 3.1-3.4	• Uses clear, easy-to-understand language together with effective listening and open questioning techniques to elicit information
Navigate the world of work	3.3	• Appreciates the implications of legal and regulatory responsibilities related to own work, with specific reference to environmental considerations
Get the work done	1.1-1.3, 2.1-2.3, 3.1, 3.2	• Develops plans to manage relatively complex non-routine tasks with an awareness of how they may contribute to longer term strategic goals • Understands key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology and when seeking to understand the potential of new technology • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of constraints into account

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT609 Lead the evaluation and implementation of current industry specific technologies	ICAICT609A Lead the evaluation and implementation of current industry specific technologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT609 Lead the evaluation and implementation of current industry specific technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine new and emerging technologies suitable for organisational requirements
- lead the implementation of new and emerging industry specific technologies
- analyse, and critically evaluate the industry specific technology and its application to the organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse and appraise current technology trends and directions in the information and communications technology (ICT) sector
- specify the major industry standards used for the new technologies
- evaluate vendor products and the direction in which they are trending
- summarise information gathering techniques
- appraise the general features, capabilities and application of current industry hardware and software products.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a site where industry specific technologies may be used
- industry specific technologies currently used in industry
- documents detailing workplace health and safety (WHS) standards, environmental guidelines and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT610 Manage copyright, ethics and privacy in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the issues of copyright and professional and ethical conduct in a team, as well as to ensure that personal information of stakeholders is handled in a confidential and professional manner.

It applies to individuals who operate at a senior level with a high degree of autonomy in managing policies and system security.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage adherence to copyright regulations	1.1 Review current Australian copyright law, and in particular its relationship to information and communications technology (ICT) 1.2 Ensure that team members are aware of Australian copyright law and how it affects their work 1.3 Institute measures to ensure that copyright is not breached 1.4 Institute regular reviews to ensure organisational copyright requirements are up to date and team members are adhering to these requirements 1.5 Distribute updated versions if required
2. Manage ethical behaviour	2.1 Review appropriate code of ethics, both organisational and ICT specific 2.2 Acquaint team members with ethical requirements 2.3 Institute regular reviews of team members' ethical work practices and feedback to ensure correct application of the code 2.4 Ensure that stakeholders are aware of ethics code, and adjust appropriately following stakeholder feedback 2.5 Institute regular reviews of stakeholder understanding and application of code of ethics 2.6 Establish a review and grievance procedure to enable confidential reporting of ethical issues 2.7 Institute regular reviews of code of ethics, updating and distributing as required
3. Manage privacy	3.1 Institute a regular review of the relevance of legislation and standards to organisational outcomes, the organisation's privacy policy and procedures, and the work practices of team members with regard to these requirements 3.2 Determine and ensure the integrity, confidentiality, security and availability of information as required by the organisational policy 3.3 Ensure continued confidentiality and proprietary rights of stakeholders' interests 3.4 Contribute to the creation or updating of the organisation's

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ELEMENT	PERFORMANCE CRITERIA
	privacy policy and procedures to align with privacy legislation 3.5 Distribute new or revised policy and procedures to stakeholders 3.6 Implement new work procedures and collect feedback from stakeholders

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1, 3.2	• Identifies, analyses and evaluates complex text to determine legislative requirements and organisational standards, and applies the information
Writing	1.2-1.4, 2.3- 2.7, 3.1, 3.4	• Integrates information and ideas from a number of sources, utilising appropriate support materials, specialised and cohesive language and a range of writing styles and document structures
Oral Communication	1.2-1.4, 2.2-2.7, 3.1-3.4	• Articulates ideas and requirements clearly, based on techniques appropriate to audience and environment • Participates in a verbal exchange of ideas and elicits the view and opinions of others by using effective listening and open questioning techniques
Navigate the world of work	1.1, 1.3, 1.4, 2.1, 2.6, 3.1, 3.2, 3.4	• Takes full responsibility for identifying and considering relevant legal and regulatory obligations when managing copyright, ethics and privacy in an ICT environment • Takes a lead role in the development of organisational goals, roles and responsibilities • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	1.5, 3.5	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience, and monitoring impact
Get the work done	1.1, 1.4, 3.1-3.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Reflects on the application of key principles in a particular context, the appropriateness and effectiveness of different sources of information and planning processes for that context, and the potential implications for future situations • Recognises broader positive and negative implications of new technologies, and acknowledges the vital importance of system security and storage management

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT610 Manage copyright, ethics and privacy in an ICT environment	ICAICT610A Manage copyright, ethics and privacy in an IT environment	Updated to meet Standards for Training Packages. Minor edit to title and to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT610 Manage copyright, ethics and privacy in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse legislation and standards related to copyright, professional conduct and privacy in the information and communications technology (ICT) industry
- contribute to the review and development of code of ethics, and monitor the workplace to ensure code of ethics is appropriate and being applied
- contribute to the review and development of a privacy policy, and monitor the workplace to ensure the policy is appropriate and being applied
- ensure the adherence to copyright, ethics and privacy in a team.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the Australian Computer Society Code of Ethics
- identify and explain federal and state or territory legislation and policy relevant to an ICT environment relating to:
  - access and equity
  - copyright and intellectual property
  - workplace health and safety (WHS)
  - privacy
- describe the processes and procedures by which an organisation communicates its policies and procedures
- outline organisational requirements for customer service
- summarise typical ICT system security systems and procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry and include access to:

- relevant organisational policies
- legislation and standards documentation
- industry codes of practice.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT801 Lead research into identifying new marketplace opportunities

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead the research, evaluation and recommendation of new organisational initiatives, based on perceived marketplace opportunities.

It applies to individuals who work as strategic business analysts in medium to large organisations in senior roles, who lead new business initiatives and transformation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Direct the research into the organisation's business domain	1.1 Research the sectors in the relevant industry for trends that may yield viable business opportunities 1.2 Research business initiatives undertaken by competitor organisations, to address the same or similar opportunities, and analyse the resources required to undertake such initiatives or project opportunities 1.3 Identify the strategies for realising identified business initiatives, including sub-contracting of suitable elements, where applicable 1.4 Research the legal, environmental and social implications of the identified initiatives
2. Evaluate the new business initiatives	2.1 Initiate, and oversee, the market research for potentially viable, identified business opportunities 2.2 Gauge the likely impacts of candidate initiatives on the business enterprise, including specific legal, financial and transformational implications 2.3 Critically evaluate the delivery strategies for anticipated products, or services, stemming from candidate initiatives
3. Explore the feasibility of the new initiatives	3.1 Formulate the selection criteria, based on the strategic business objectives 3.2 Facilitate a feasibility study, including a cost benefit analysis 3.3 Select the most feasible option against the selection criteria 3.4 Recommend the preferred initiative

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.1, 3.3	• Identifies, analyses, and critically evaluates complex textual information, to identify industry trends and business initiatives
Writing	2.1, 3.1, 3.4	• Integrates information and ideas from a number of sources, utilising the appropriate analysis tools, diagrams, specialised and cohesive language, and formal document structures, to develop criteria and reports
Oral Communication	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.2, 3.4	• Elicits the view and opinions of others, and obtains information, by using effective listening and open questioning techniques • Participates in a verbal exchange of ideas/solutions, and uses detailed and clear language, to clarify and present information, and to facilitate a feasibility study • Uses the appropriate tone, style, body language and reflective responses, when clarifying information to present recommendations
Numeracy	1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3	• Uses a range of statistical and financial calculations and functions, the appropriate software tools, and correct document structure, to analyse market research results and to conduct a feasibility study, and a cost benefit analysis
Navigate the world of work	1.4, 2.2	• Understands own legal rights and responsibilities, and extends the understanding of legal implications across work contexts
Get the work done	1.1, 1.2, 1.3, 2.1, 2.3, 3.1, 3.2, 3.3	• Recognises the critical importance of clarifying, focusing and aligning goals, and expectations, and uses the process to build ownership of, and broad commitment to, achieving outcomes • Takes responsibility for high-impact decisions in complex situations, involving many variables and constraints • Keeps abreast of new ideas and possibilities beyond own context, borrowing, adapting, combining, and redesigning ideas, for own purposes, or using as a provocation to rethink current approaches

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT801 Lead research into identifying new marketplace opportunities	ICAICT701A Lead research into identifying new marketplace opportunities	Updated to meet Standards for Training Packages. Recoded and minor changes to Performance Criteria to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT801 Lead research into identifying new marketplace opportunities

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- conduct research into the trends for a specified industry sector, and identify potential business opportunities
- undertake market research and analysis, and report on the viability and related implications, of a selected business opportunity
- develop and present a feasibility report, including a cost benefit analysis that justifies the recommendations for a proposed new business initiative.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- formulate various analysis methods and tools, including:
  - affinity diagrams
  - competition matrix
  - decision trees
  - mind maps
  - risk assessment
  - strengths, weaknesses, opportunities and threats (SWOT) analysis
  - value chain
- review and outline, contract and procurement methods
- summarise possible social implications, both internal and external, to the organisation as a result of the introduction of new market opportunities
- research government and non-government governing bodies in the relevant industry
- review legal, ethical, and security issues relating to the research of competitive business opportunities, including the laws related to patents and copyright
- outline the organisational structure, policies and procedures
- review the relevant government legislation that affects business operation.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- appropriate resources, to allow research to be conducted into industry trends (this may include access to commercial research house libraries via a memorandum of understanding or other arrangements)
- the opportunity to conduct meaningful market research on potential business opportunities
- simulated, or real, executive-level management teams for the presentation of proposals and feedback.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT802 Direct ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to direct the strategic planning, risk management, and security of emerging, and converging, information and communications technology (ICT) services, internal and external, of medium to large organisations.

It applies to individuals in senior management roles who lead the management of business process to support organisational strategic goals of organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Direct the strategic planning for ICT resources	1.1 Critically analyse the organisational environment 1.2 Ensure compliance with legislative and social requirements 1.3 Establish priorities, based on organisational needs 1.4 Establish the ICT infrastructure 1.5 Lead the development and implementation of a strategic plan for ICT resourcing
2. Lead the risk management of ICT resources and processes	2.1 Lead the development of a strategy for risk assessment 2.2 Ensure that the risk assessment complies with organisational policy 2.3 Ensure that risk mitigation is based on identified risks
3. Direct the quality assurance processes for ICT services	3.1 Lead the development of a quality assurance strategic plan 3.2 Monitor the quality processes 3.3 Oversee the implementation of quality assurance strategies 3.4 Ensure that continuous improvement is undertaken

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 3.2	• Identifies, analyses and evaluates complex information from a range of sources, to obtain the information relevant to ICT strategic planning • Interprets complex ideas, concepts and unfamiliar information
Writing	1.3, 1.4, 1.5, 2.1, 3.1	• Integrates information and ideas from a number of sources, utilising the appropriate modelling tools, specialised and cohesive language, and formal document structures, to meet the requirements of the audience and the task
Oral Communication	1.1-1.5, 2.1-2.3, 3.1-3.4	• Uses effective listening and probing, open questioning techniques to elicit the views and opinions of others, and to obtain information • Participates in a verbal exchange of ideas and solutions, and uses detailed and clear language to clarify and present information, according to the requirements and the audience • Articulates requirements and strategies clearly, using the appropriate pitch, tone, body language and reflective responses
Numeracy	1.1, 1.5, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3	• Uses a range of statistical, mathematical and financial calculations and functions, and relevant software tools, to interpret data relating to the development of the strategic plan, and to develop cost benefit analyses, and operational budgets
Navigate the world of work	1.2, 2.2	• Monitors adherence to legal and regulatory rights, and responsibilities, in order to direct strategic planning • Recognises that workplace protocols that must be respected, and maintained, during risk management
Get the work done	1.1, 1.3, 1.4, 1.5, 2.1, 2.3, 3.1	• Develops plans for complex, high-impact activities with strategic implications • May use formal decision-making processes as scaffolding for thinking, moving iteratively between phases as required • May use formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions • Explores, and incubates, ideas that have the

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		potential to lead to radical departures from the current situation • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot, and understand, the uses of potential and new technology

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT802 Direct ICT services	ICAICT702A Direct ICT services	Updated to meet Standards for Training Packages. Recoded and minor changes to the Elements and Performance Criteria to meet AQF requirements	Equivalent unit

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Assessment Requirements for ICTICT802 Direct ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- lead the development of a strategy to align information and communications technology (ICT) services, with organisational goals
- lead and monitor a risk analysis, including security for ICT assets
- implement procedures that identify where risk occurs, and what measures need to be taken
- produce contingency plans for business continuity
- establish warning systems, and an ongoing process, that includes regular or programmed reviews of the risk profile
- lead the development of a strategy and the implementation of a quality assurance process.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the security products, and organisational security policies, that affect ICT services
- research and then outline, the standards that relate to risk management principles and guidelines
- discuss business continuity issues for the organisation
- examine the organisation's industry and current functionality, including the existing data and information systems
- review and describe, the organisation's internal and external dependencies and interdependencies
- describe the organisational policies and procedures, including the risk-management strategy
- review and analyse, past and current internal, external and industry disruptions
- outline the relevant legislation and regulations that impact on business continuity including:
  - workplace health and safety (WHS)
  - environment
  - duty of care
  - contracts
  - business and company law
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic level enterprise documentation, including:
  - planning
  - financial
  - ICT infrastructure
- codes of practice, legislation and regulations
- organisational policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT803 Endorse business plan components for a new initiative

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to endorse a business plan for a new initiative, including the marketing, operations, organisational and financial plans within a medium to large organisation.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, information and communications technology (ICT), as they are integrated into the business process to support the organisational strategic goals of medium to large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Endorse a marketing plan for ICT business	1.1 Ensure that internal and external environmental issues are addressed 1.2 Critically review the feasibility of target market projections 1.3 Endorse the selection of advertising and promotional strategies
2. Endorse the operation plan	2.1 Review and verify, the scope of the business operation plan 2.2 Ensure that the business plan complies with business needs 2.3 Endorse the criteria for quality processes against the organisational standards
3. Endorse the organisational plan	3.1 Critically analyse and review the organisation's structure 3.2 Ensure that the organisational structure meets the organisation's strategic plans and directions
4. Endorse the financial plan	4.1 Endorse the financial strategy for the new initiative 4.2 Evaluate the expected cash-flow projections 4.3 Critically analyse and evaluate the effects of financial decisions on the ability of the organisation to meet planned outcomes 4.4 Ensure financial risk-management procedures are followed according to organisational requirements 4.5 Ensure early detection and remedial action plans, for deviations in budget objectives and projections

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3, 4.4	• Identifies, critically analyses and evaluates complex textual information, to evaluate the effectiveness of business plans
Writing	1.3, 2.3, 3.2, 4.1, 4.3, 4.4, 4.5	• Selects the document structure, language, grammar and terminology, to suit the specific subject matter and audience when evaluating, providing feedback, and endorsing business plans
Oral Communication	1.1-1.3, 2.1-2.3, 3.1-3.2, 4.1-4.5	• Obtains information by using effective listening and probing, open questioning techniques • Uses grammatical structures, specialised language, and the appropriate tone, pitch and body language to achieve precise meaning, when articulating requirements and providing feedback
Numeracy	1.2, 2.1, 2.2, 3.2, 4.1, 4.2, 4.3, 4.4, 4.5	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with appropriate software tools, to interpret numerical data relating to the market, operational and financial plans, and risk analysis
Navigate the world of work	3.2, 4.4	• Takes responsibility to respond to explicit and implicit conventions within familiar work contexts, and appreciates the importance of identifying, and responding to, protocols in new situations
Get the work done	1.1, 2.1, 2.2, 3.1, 4.3, 4.4, 4.5	• Recognises the critical importance of clarifying, focusing and aligning goals, and expectations, and uses the process to build ownership of, and broad commitment to, achieving outcomes • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • May use formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and endorses new technologies

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT803 Endorse business plan components for a new initiative	ICAICT703A Endorse business plan components for a new initiative	Updated to meet Standards for Training Packages. Recoded and minor changes to Elements and Performance Criteria to meet AQF requirements	Equivalent unit

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Assessment Requirements for ICTICT803 Endorse business plan components for a new initiative

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- verify the strategy aligning information and communications technology (ICT) services with organisational goals
- direct a critical risk analysis, including security, for ICT assets
- verify that the risk assessment procedures are implemented
- verify that the contingency plans for business continuity are established
- evaluate the warning systems, and direct an ongoing process that includes regular or programmed reviews of the risk profile
- verify that security products are being utilised
- verify organisational security policy is being implemented
- direct the development of a strategy to ensure that quality expectations are being met
- endorse the main components of the business plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and summarise, risk management principles and guidelines
- review business continuity issues for the organisation
- explore the organisation's industry and current functionality, including the existing data and information systems
- describe the organisation's internal and external dependencies, and interdependencies
- review and summarise the organisational policies and procedures, including the risk-management strategy
- discuss past and current internal, external and industry disruptions
- outline the relevant legislation and regulations that impact on business continuity, including:
  - workplace health and safety (WHS)
  - environment
  - duty of care
  - contracts
  - business and company law
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic-level enterprise documentation, including:
  - planning
  - financial
  - ICT infrastructure documentation
- legislative policies.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT804 Direct ICT in a supply chain

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to direct the effective use of information and communications technology (ICT), in support of critical supply chain processes.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, ICTs as they are integrated into the business process to support the organisational strategic goals of medium to large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the current or proposed supply chain infrastructure	1.1 Critically evaluate the key principles of supply chain management 1.2 Identify the supply chain processes in the organisation, from operational and business perspectives 1.3 Identify and review, management and operational links to external organisations 1.4 Identify current supply chains, network processes, service and performance objectives
2. Direct ICT strategy to support supply chain processes	2.1 Develop a strategy to align ICT technical resources with the identified supply chain processes 2.2 Build a communication model to improve the integration, and sharing of, critical business information between decision-makers and the operations and technical divisions 2.3 Identify the key performance indicators that will track progress against the strategic company objectives
3. Lead the risk management of supply chain ICT support services	3.1 Lead the development of a strategy for the risk assessment of internal, and external, supply chain processes 3.2 Assess the risk assessment strategy, to ensure that it complies with organisational policy 3.3 Mitigate identified risks
4. Direct the quality assurance processes for supply chain ICT support services	4.1 Implement strategies to monitor the performance levels of supply chain ICT support services 4.2 Ensure the continuous improvement of supply chain ICT support services

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.3, 3.2	• Identifies, analyses and evaluates complex textual information relevant to the job role
Writing	2.1, 2.2, 2.3, 3.1, 4.1, 4.2	• Selects the document structure, language, grammar and terminology to suit the specific subject matter, and audience, when developing strategic plans, a supply chain model, and a communication model
Oral Communication	1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2	• Obtains information by using effective listening and probing, and open questioning technique • Uses grammatical structures, specialised language, and the appropriate tone, pitch and body language to achieve precise meaning, when articulating requirements and providing feedback
Numeracy	2.1, 2.3, 3.1, 3.2, 4.1, 4.2	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with appropriate software tools, to interpret numerical data relating to performance objectives, key performance indicators, risk assessment and continuous improvement
Navigate the world of work	3.2	• Recognises and responds to organisational policies and protocols within the workplace
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.3, 4.2	• Considers the strategic and operational potential of digital technology to achieve work goals, enhance work processes, create opportunities, and reduce risks • Draws on a broad understanding of the context, and uses a combination of analysis and intuition to decide whether an idea is worth developing, and implementing • Uses a nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focusing attention on critical issues and variables, and filtering out any peripheral issues • Develops plans for complex high-impact activities with strategic implications

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT804 Direct ICT in a supply chain	ICAICT704A Direct ICT in a supply chain	Updated to meet Standards for Training Packages. Recoded to meet AQF requirements	Equivalent unit

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Assessment Requirements for ICTICT804 Direct ICT in a supply chain

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop strategic directions for supply chain management in alignment with the organisational goals
- develop a strategy and key performance indicators for supply chain processes
- lead the development of a risk analysis strategy for a supply chain
- ensure that procedures identifying where risk occurs, and the measures needed to mitigate such risk, are developed and implemented
- ensure that a continuous improvement plan, for the information and communications technology (ICT) support of supply chain processes, is developed and implemented.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the typical supply chain models, and describe their management and business process integration
- discuss business continuity issues for the organisation
- describe the impact on the supply chain of the organisation's industry and current functionality, including the existing data and information systems
- summarise the organisation's internal and external dependencies, and interdependencies
- review and outline the organisational policies and procedures, including the risk-management strategy
- describe past and current, internal, external and industry disruptions that may impact on the supply chain
- outline the relevant legislation and regulations that impact on business continuity including:
  - workplace health and safety (WHS)
  - environment
  - duty of care
  - contracts
  - business and company law
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic-level enterprise, including:
  - planning
  - financial
  - ICT infrastructure
- codes of practice, legislation and regulations
- organisational policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT805 Direct ICT procurement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to direct information and communications technology (ICT) procurement for a medium to large organisation.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, ICTs as they are integrated into the business process to support the organisational strategic goals of medium to large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate the procurement processes of the organisation	1.1 Research existing ICT procurement processes in the organisation 1.2 Establish the evaluation criteria for procurement processes 1.3 Critically evaluate the procurement processes against the criteria
2. Direct the strategic planning to support ICT procurement	2.1 Establish the priorities based on the organisational need 2.2 Lead the development of a strategy to align ICT procurement with the organisational goals and objectives 2.3 Implement the ICT procurement strategic plan 2.4 Develop the procurement policy, including vendor selection based on the strategic plan
3. Lead the risk management of ICT procurement	3.1 Lead the development of a strategy for the risk assessment of ICT procurement activities 3.2 Ensure that ICT procurement complies with the organisational policy 3.3 Ensure that risk mitigation is carried out on identified risks 3.4 Ensure the continuous improvement of ICT procurement processes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 3.4	• Researches and critically analyses, and evaluates, complex textual information relevant to the job role
Writing	1.2, 2.1, 2.2, 2.4, 3.1, 3.4	• Selects the document structure, language, grammar and terminology to suit the specific subject matter and audience, when developing cost benefit analyses, strategic plans and policies
Oral Communication	1.1-1.3, 2.1-2.4, 3.1-3.4	• Uses effective listening and probing, open questioning techniques, to elicit the views and opinions of others, and to obtain information • Participates in a verbal exchange of ideas and solutions, and uses detailed and clear language, to clarify and present information, according to the requirements and the audience • Articulates the requirements and strategies clearly, using the appropriate pitch, tone, body language, and reflective responses
Numeracy	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with the appropriate software tools, to interpret numerical and financial data relating to cost benefit analyses, evaluation criteria, key performance indicators, risk assessment and continuous improvement
Navigate the world of work	2.2, 3.2	• Takes a lead role in the development of organisational goals, roles and responsibilities • Develops and implements strategies that ensure that the organisational policies, procedures, and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements, to implement and manage change
Interact with Others	2.2, 3.1	• Selects, implements and manipulates the communications systems, processes and practices for maximum impact • Recognises the potential for conflict and, working with others, seeks to develop the organisational processes to deal with conflict

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		• Understands diversity, and seeks to integrate diversity into the work context for managing change, making decisions and achieving shared outcomes
Get the work done	1.1, 1.2, 1.3, 2.1, 2.3, 3.1, 3.4	• Considers the strategic and operational potential of digital technology in order to achieve work goals, enhance work processes, create opportunities and reduce risks • Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Identifies the key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision-making strategies, where appropriate • Addresses complex problems involving multiple variables, using formal analytical, and lateral thinking techniques, and experience and knowledge, in order to focus

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT805 Direct ICT procurement	ICAICT705A Direct ICT procurement	Updated to meet Standards for Training Packages. Recoded and minor edits to Performance Criteria to meet AQF requirements	Equivalent unit

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Assessment Requirements for ICTICT805 Direct ICT procurement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- lead the development of a strategy to align information and communications technology (ICT) procurement, with organisational goals and objectives
- critically evaluate the procurement process and establish priorities for the organisation
- direct the risk analysis of ICT procurement activities
- lead the development of a strategy for risk assessment, and ensure that the measures required to mitigate the risk are applied
- ensure that warning systems, and an ongoing process that reviews the risk profile, are established
- lead the development of a strategy for the implementation of appropriate processes and procedures, that ensure that quality expectations are met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and specify risk management principles and guidelines
- review business continuity issues for the organisation
- summarise the organisation's industry and current functionality, including the existing data and information systems
- review the organisation's internal and external dependencies, and interdependencies
- identify and review the organisational policies and procedures, including the risk management strategy
- review and analyse past and current, internal, external and industry disruptions
- outline the relevant legislation and regulations that impact on business continuity including:
  - workplace health and safety (WHS)
  - environment
  - duty of care
  - contracts
  - business and company law
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management
- summarise the key principles of procurement.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic-level enterprise, including:
  - planning
  - financial
  - ICT infrastructure
- codes of practice, legislation and regulations
- organisational policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT806 Direct outsourced ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop strategic plans, and change-management strategies, for outsourced information and communications technology (ICT) services. It includes developing, tracking and managing service level agreements (SLAs), and ensuring continuous improvement.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, ICTs as they are integrated into the business process to support the organisational strategic goals of medium to large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Direct the strategic planning for outsourced ICT services	1.1 Identify the ICT services to be outsourced 1.2 Establish the criteria for the outsourcing model 1.3 Critically analyse the impact on the current organisational environment 1.4 Select an appropriate business model for outsourcing, against the identified criteria 1.5 Research the appropriate ICT service providers (vendor evaluation), against the identified criteria 1.6 Develop the strategic plan for outsourced ICT services
2. Lead the risk management of outsourced ICT services	2.1 Specify the relevant security requirements 2.2 Lead the development of the change management strategy 2.3 Negotiate the performance, and a security strategy, with the ICT service provider 2.4 Ensure that the risk assessment process for outsourced services complies with organisational policy 2.5 Ensure that risk mitigation addresses the identified risks
3. Monitor the performance levels of the outsourced ICT service performance agreement	3.1 Develop external ICT service provider SLAs 3.2 Ensure that the external ICT service provider agreed performance levels are maintained 3.3 Monitor the setting, tracking and management of SLAs, as an important part of outsourcing relationship management (ORM) 3.4 Ensure the continuous improvement of outsourced ICT services

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 1.5, 2.4, 2.5, 3.4	• Identifies, analyses and evaluates complex textual information relevant to the job role
Writing	1.1, 1.6, 2.1, 2.2, 2.4, 2.5, 3.1	• Selects the document structure, language, grammar and terminology to suit the specific subject matter and audience, when developing strategies, SLAs, and continuous improvement processes
Oral Communication	1.1-1.6, 2.1-2.5, 3.1-3.4	• Uses effective listening and probing, open questioning techniques to elicit the view and opinions of others, and to obtain information • Participates in a verbal exchange of ideas and solutions, and uses detailed and clear language to clarify and present information, according to the requirements and the audience • Uses negotiation technique, the appropriate pitch, tone and body language, reflective responses, and revises own speaking to enhance meaning and effectiveness, when negotiating with service providers
Numeracy	1.2, 1.3, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with the appropriate software tools, to interpret numerical and financial data relating to cost benefit analyses, SLAs, and risk assessment, and continuous improvement processes
Navigate the world of work	2.4	• Recognises protocols and policies that must be respected and maintained in the workplace, to reach explicit goals
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.2, 2.5, 3.1, 3.2, 3.3, 3.4	• Considers the strategic and operational potential of digital technology in order to achieve work goals, enhance work processes, create opportunities and reduce risks • Draws on a broad understanding of the context, and uses a combination of analysis and intuition, to decide whether an idea is worth developing and implementing • Develops plans for complex high-impact activities with strategic implications

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		• Recognises and addresses complex problems involving multiple variables

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT806 Direct outsourced ICT services	ICAICT706A Direct outsourced ICT services	Updated to meet Standards for Training Packages. Recoded to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT806 Direct outsourced ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop strategic directions for outsourcing of information and communications technology (ICT) resources, in alignment with organisational goals
- lead the development of a risk analysis strategy on outsourced ICT services
- ensure that procedures identifying risk and, measures to mitigate risk, are developed and implemented
- ensure warning systems, and an ongoing process of reviews of the risk profile of outsourced ICT services, are established
- review and monitor, the performance of service level agreements (SLAs) with external service providers.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and summarise, risk management principles and guidelines
- research and summarise the outsourcing strategies for ICT services
- outline business continuity issues for the organisation
- review the organisation's current functionality, including the existing data and information systems
- review the organisation's internal and external dependencies, and interdependencies
- review the organisational policies and procedures, including the risk management strategy
- review past and current, internal, external and industry disruptions
- outline the relevant legislation and regulations that impact on business continuity including:
  - workplace health and safety (WHS)
  - environment
  - duty of care
  - contracts and service level agreements
  - business and company law
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management
- describe the business domain and organisational requirements.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic-level enterprise documentation, including:
  - planning
  - financial
  - ICT infrastructure
- legislative policies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT807 Direct research and business response to new ICT technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to direct the research, evaluation, vendor evaluation, feasibility, proof of concept (POC) evaluation of, and future business response to, new information and communications technology (ICT) that supports business strategies.

It applies to individuals who work in high-level management positions and direct the investigation and future business direction of new ICT technology in their organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Direct the initial research into new ICT	1.1 Establish and implement, procedures to identify new ICT that may support business innovation 1.2 Confirm the research purpose for the evaluation of new ICT, as it relates to possible business opportunities 1.3 Ensure that a structured research plan is prepared in line with the defined research purpose 1.4 Monitor the implementation of the structured research plan, to ensure that its outcomes meets the identified research purpose 1.5 Formulate a business case relating to the new ICT, including consideration of the organisational environment 1.6 Present a business case to the business stakeholders, so that the future business direction is established and agreed
2. Direct the evaluation of new ICT	2.1 Establish the evaluation criteria and methods of measurement 2.2 Ensure that suitable suppliers and vendors are appropriately evaluated, in order to provide credibility, quality and support for implementation 2.3 Oversee the preparation of a feasibility study report into the new ICT, ensuring that critical risks are identified 2.4 Ensure that the feasibility study of the new ICT is accurately presented to business stakeholders, so that the future business direction is established and agreed
3. Direct the proof of concept evaluation of new ICT	3.1 Ensure that the vendor's new ICT is legally acquired for a proof of concept evaluation of the new technology 3.2 Establish the project's requirements, including deliverables, for a proof of concept (POC) evaluation of the new ICT 3.3 Endorse the project plan for POC evaluation 3.4 Monitor the implementation of the POC evaluation project, to ensure that project deliverables are met
4. Determine future business response to new ICT technology	4.1 Oversee the preparation of the evaluation report on the new ICT including the consequences of not implementing it 4.2 Ensure that the results of the new ICT evaluation are

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ELEMENT	PERFORMANCE CRITERIA
	accurately presented to stakeholders, so that the future business response is established and agreed

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.3, 3.4, 4.1, 4.2	• Identifies, analyses and evaluates, complex textual information relevant to the job role
Writing	1.1, 1.3, 1.5, 2.1, 2.3, 3.2, 3.3, 4.1	• Selects the document structure, language, grammar and terminology to suit the specific subject matter and audience, in order to develop a wide variety of documentation
Oral Communication	1.1-1.6, 2.1-2.4, 3.1-3.4, 4.1-4.2	• Uses effective listening and probing, open questioning techniques, to elicit the view and opinions of others, and to obtain information • Employs plain English to convey complex and abstract concepts, and information • Uses negotiation techniques, the appropriate pitch, tone and body language, reflective responses, and revises own speaking, to enhance meaning and effectiveness, when presenting information to stakeholders
Numeracy	1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with appropriate software tools, to interpret numerical and financial data
Navigate the world of work	1.5, 3.1	• Takes full responsibility for identifying and considering, the organisational policies, legislation and regulations affecting new ICT technology
Get the work done	1.1, 1.2, 1.4, 1.5, 2.1, 2.3, 3.2, 3.4	• Develops flexible plans for complex, high-impact activities with strategic implications • Takes responsibility for high-impact decisions in complex situations, involving many variables and constraints • Keeps abreast of innovations and good practice beyond own context, borrowing, adapting, combining and redesigning for own purposes, or using as a provocation to rethink current approaches • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these

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		to troubleshoot, and understands the uses and potential of new technology • Recognises broader positive, and negative implications, of new technologies and factors all relevant risks into business responses

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT807 Direct research and business response to new ICT technology	ICAICT707A Direct research and business response to new ICT technology	Updated to meet Standards for Training Packages. Recoded and minor edits to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT807 Direct research and business response to new ICT technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- direct the research and evaluation of new information and communications technology (ICT) for an organisation, including the production of a:
  - research plan
  - business case
  - feasibility study
  - project plan
- monitor, evaluate and report on a POC evaluation project
- access and convey the conceptual information regarding new ICT technology in relation to organisational needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and summarise, the stakeholder business domain, business function, processes and organisation
- state and outline, the components of the business planning process relevant to the investigation of the particular new ICT technology
- review the current business practices related to conducting an investigation into new ICT technology
- summarise client business needs, with a view to expanding into new possibilities, as presented by new ICT technology
- outline customer and business liaison techniques
- identify and apply, information gathering and presentation techniques
- summarise the quality assurance practices, to promote reliable investigation processes
- outline the vendor product directions
- interpret the general features, and capabilities, of current and emerging ICT industry-accepted technologies, and trends
- specify current industry and technology information sources
- specify and evaluate, the industry networks, key individuals and organisations within the ICT industry
- discuss the methods for evaluating new ICT technology.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- the relevant feasibility studies
- ICT technologies, suppliers and manuals
- research facilities
- codes of practice, standards, legislations and regulations
- organisational policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT808 Direct the development of a knowledge management strategy for a business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to evaluate existing knowledge management processes, identify barriers to capturing knowledge, and to develop new strategies.

It applies to individuals who work in senior management positions and lead the analysis, implementation and management of emerging, and converging, information and communications technology (ICT), as they are integrated into the business process to support the organisational strategic goals.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Critically analyse existing knowledge management systems	1.1 Critically evaluate the existing arrangements ,for the capture and use of business knowledge, from internal and external sources 1.2 Differentiate between knowledge management and information management systems within the organisation 1.3 Ensure that the effectiveness of existing procedures and systems is evaluated in terms of meeting the needs of clients, organisational aims, objectives and standards 1.4 Identify the need for improvements in the organisation's strategic use of knowledge
2. Evaluate the knowledge management options	2.1 Investigate the barriers to capturing knowledge within the organisation 2.2 Review evaluations and recommendations regarding the knowledge management software, with respect to its usefulness and likeliness to benefit the organisation 2.3 Review the investigations into incentives and reward systems to support knowledge management 2.4 Ensure that the required processes for maintaining an integrated knowledge management system are considered 2.5 Facilitate the development of a business case to determine the viability of selected options, and recommend a way forward for the organisation
3. Develop a knowledge-management strategy	3.1 Develop the knowledge management business strategy, in consultation with senior staff, for the capture and use of organisational knowledge 3.2 Ensure that business processes are designed to support knowledge management, according to the organisational needs and budget 3.3 Ensure that the technology requirements for the implementation of the strategy, are costed and included in the organisational budget cycle 3.4 Ensure that processes for the periodic review of knowledge management metrics within the business are in place, to maintain ongoing effectiveness and continuous improvement 3.5 Ensure that the knowledge management strategy meets the

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ELEMENT	PERFORMANCE CRITERIA
	organisational requirements identified in the overall business plan, and business strategy

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.3, 3.4, 3.5	• Identifies and reviews a wide variety of complex textual information, sourced from organisational documentation, electronic meeting places, communities of practice, the organisational knowledge bank and ICT vendors
Writing	2.5, 3.1	• Selects a formal document structure, organisational style and format, and subject-specific language, grammar and terminology, to develop organisational documentation
Oral Communication	1.1-1.4, 2.1-2.5, 3.1-3.5	• Uses effective listening and open questioning techniques, to elicit the view and opinions of others, and to obtain information • Participates in a verbal exchange of ideas and solutions, and uses detailed and clear language to clarify and present information, according to the audience • Uses the correct grammatical structures, specialised language, appropriate tone, pitch and body language, to achieve precise meaning when articulating requirements
Numeracy	1.1, 1.3, 2.1, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5	• Uses a range of mathematical and financial calculations and functions, together with the appropriate software tools, to interpret and develop numerical and financial reports, relating to costing and budgets
Navigate the world of work	1.3, 3.5	• Monitors adherence to organisational policies and procedures, and considers own role in terms of a contribution to the broader goals of the work environment
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.3, 3.4, 3.5	• Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues, and contingencies • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • May use formal analytical and lateral thinking

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		techniques for identifying issues, generating and evaluating possible solutions • Plays with possibilities as an integral part of work, identifying principles, concepts and features of new perspectives and ideas • Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTICT808 Direct the development of a knowledge management strategy for a business	ICAICT708A Direct the development of a knowledge management strategy for a business	Updated to meet Standards for Training Packages. Recoded and minor changes to Performance Criteria to meet AQF requirements	Equivalent unit

Links

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Assessment Requirements for ICTICT808 Direct the development of a knowledge management strategy for a business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- critically analyse and document, the effectiveness of existing knowledge management systems
- research the knowledge management options in the marketplace
- recommend an approach that meets the organisational needs
- develop a knowledge management strategy.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise management concepts, processes and trends
- review and interpret relevant organisational policies, and legislation, that affect business operations
- research and summarise, both internal and external sources of information
- recognise the legal, ethical and security issues relating to knowledge management
- explain organisational change-management theory and methods
- discuss records management and database-management principles as they relate to knowledge management, particularly metadata.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology industry (ICT), and include access to:

- a workplace of sufficient complexity, to enable the required level of analysis to be carried out in relation to:
  - current business processes
  - existing knowledge management systems
  - the organisational culture
- relevant enterprise strategic documentation, including:
  - strategic planning
  - financial
  - ICT infrastructure
- organisational objectives and policies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT809 Facilitate business analysis

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to direct internal and external information and communications technology (ICT) services within a medium to large organisation.

It applies to individuals who work in high-level management positions in medium to large organisations and direct the strategic planning, risk management, and security of the internal and external ICT infrastructure of their organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Facilitate the elicitation of stakeholder business requirements for enhancements	1.1 Review the business requirements documentation, and ensure that it is complete and according to enterprise standards 1.2 Ensure that the proposed project benefits align with strategic directions 1.3 Determine the scope, complexity, deliverables, and time lines of the business process enhancements to be undertaken
2. Prioritise the enhancements that add value to business operations	2.1 Research the business operations necessary to analyse the business domain 2.2 Negotiate the requirements definition with stakeholders 2.3 Develop a process for addressing change requests in a dynamic environment
3. Provide the interface between technical and business stakeholders	3.1 Facilitate the selection of a modelling tool for a business system 3.2 Facilitate the selection of information-gathering tools 3.3 Ensure that the requirements-analysis content addresses the project objectives 3.4 Participate in the development of a technical specification

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 3.4	• Identifies, analyses and evaluates complex textual information, to obtain information relevant to enterprise resource planning and management
Writing	2.3, 3.4	• Integrates information and ideas from a number of sources, utilising appropriate ICT modelling tools, specialised and cohesive language, and document structures, to meet the varied requirements of the enterprise and stakeholders
Oral Communication	1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4	• Elicits the view and opinions of others, and obtains information by listening and questioning • Participates in a verbal exchange of ideas/solutions, and uses detailed and clear language, to clarify and present information, according to the requirements and audience • Articulates requirements and strategies clearly, using the appropriate tone, style, body language, and reflective responses, to build business relationships
Numeracy	1.1, 1.2, 1.3, 3.4	• Uses a range of statistical and financial calculations and functions, to interpret and compile data relating to market analysis and budgetary requirements
Navigate the world of work	1.2	• Takes full responsibility for considering own role in terms of a contribution to the broader goals of the work environment
Get the work done	1.1, 1.2, 1.3, 2.1, 2.3, 3.1, 3.2, 3.4	• Develops flexible plans for complex, high-impact activities with strategic implications • Takes responsibility for high-impact decisions in complex situations, involving many variables and constraints • Keeps abreast of innovations and good practice beyond own context, borrowing, adapting, combining and redesigning for own purposes, or using as a provocation, to rethink current approaches • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot, and understands the uses and potential of new technologies

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT809 Facilitate business analysis	ICAICT709A Facilitate business analysis	Updated to meet Standards for Training Packages. Recoded and minor changes to Performance Criteria to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT809 Facilitate business analysis

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- facilitate a strategy to align information and communications technology (ICT) services, with the organisational goals
- lead the development of a strategy for risk assessment, including security for ICT assets, and ensure that the measures required to mitigate risk are applied
- produce contingency plans for business continuity
- ensure warning systems, and an ongoing process that includes regular or programmed reviews of the risk profile
- lead the development of a strategy for the implementation of the appropriate processes and procedures, to ensure that quality expectations are met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise AS/NZS ISO 31000:2009 "risk management requirements"
- explain application of security products
- review business continuity issues for the organisation
- review the organisation’s industry and current functionality, including the existing data and information systems
- review the organisation's internal and external dependencies, and interdependencies
- outline the organisational policies and procedures, including the risk management strategy
- review and outline documented industry disruptions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- relevant strategic level enterprise documentation, including:
  - planning
  - financial
  - ICT infrastructure
- standards, codes of practice, legislation and regulations.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT810 Synchronise ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that internal, and external, information and communications technology (ICT) projects fit within the strategic and economic constraints of the organisation, and deliver the expected financial benefits.

It applies to individuals who work in high-level management positions, plan and manage the implementation of sustainability strategies, and lead the analysis, implementation and management of emerging, and converging, ICT as they are integrated into the business process, to support organisational strategic goals and meet sustainability targets.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate project opportunities	1.1 Critically evaluate the project proposals in a strategic context 1.2 Review financial criteria to determine economic feasibility of projects 1.3 Prioritise projects to leverage financial resources
2. Monitor the project performance	2.1 Direct the project schedule and budget development 2.2 Direct the integration of the project activities 2.3 Critically evaluate project performance, using earned value techniques 2.4 Proactively manage strategic projects' risks and issues 2.5 Identify and take action to address unsatisfactory performance
3. Manage project completion activities	3.1 Direct financial completion 3.2 Establish the benefits realisation plans 3.3 Apply project lessons learned strategically

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.3, 2.5	• Identifies, critically analyses and evaluates a wide range of complex organisational documentation, relevant to the projects under consideration
Writing	1.3, 2.1, 2.2, 3.2, 3.3	• Selects a formal document structure and uses technical terminology, the correct spelling and grammar, and a high degree of accuracy, to develop project schedules, plans and financial reports
Oral Communication	2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	• Uses effective listening and probing, open questioning techniques to elicit information • Articulates requirements and strategies clearly, in a courteous manner, using appropriate pitch, tone, body language and reflective responses
Numeracy	1.1, 1.2, 1.3, 2.1, 2.2, 3.3, 2.5, 3.1, 3.2	• Uses a range of statistical, mathematical and financial calculations, formulae and functions, together with the appropriate software tools, to determine the economic feasibility, earned value, and the benefit realisation plan, of projects
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3	• Develops plans for complex high-impact activities with strategic implications • Takes responsibility for high-impact decisions in complex situations, involving many variables and constraints • Reflects on the application of key principles in a particular context, the appropriateness and effectiveness of different sources of information, and problem-solving processes, for that context and the implications for future situations • Explores ideas that have the potential to lead to radical departures from the current situation • Considers the strategic and operational potential of digital trends, to achieve work goals, enhance work processes, create opportunities, pose threats, and enhance or reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT810 Synchronise ICT projects	ICAICT710A Synchronise IT projects	Updated to meet Standards for Training Packages. Minor edit to title. Recoded and minor changes to Performance Criteria to meet AQF requirements.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT810 Synchronise ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select the project opportunities that align with the organisational strategic and financial goals
- review and validate, high priority projects to be undertaken based on the trade-offs between benefits, risks and scarce financial resources
- develop the schedule and budget for selected projects, to enable ongoing earned value performance measurement
- review project performance and initiate appropriate corrective actions and audit activity, where necessary
- establish and monitor, an agreed project benefits realisation plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline appropriate cost management and estimating methodologies, techniques and tools, their capabilities and limitations, applicability and outcomes
- discuss business and commercial issues
- discuss cost schedule control systems
- outline the processes of delegation and the management of responsibilities for cost management
- discuss the differences in work content, risk, processes, tools and techniques that apply in the various phases of recurring project life cycles, within a volatile program environment
- explain the direction of project development and the management of program budgets
- outline human resource management policies
- discuss how to apply the principles and techniques relating to:
  - negotiation
  - risk management, including risk sharing and transfer
- outline the organisational guidance and attitudes to cost management
- outline organisational procurement guidelines
- outline organisational policies, including project governance policies
- discuss the principles of program project-cost management and its application
- discuss project management systems, tools and techniques
- outline the project specifications and objectives
- outline the public relations policies and strategies
- discuss the relationship of cost, time and resources, to the project management framework
- describe the political climate and the organisation's culture
- discuss the use of the budget as a control mechanism.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- relevant strategic level enterprise documentation, including:
  - planning
  - financial
  - ICT infrastructure
- organisational policies.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT811 Manage an information architecture project

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge to develop and test an information architecture prototype that meets organisational requirements.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, information and communications technology (ICT) as they are integrated into the business process to support organisational strategic goals.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define the content needs	1.1 Research the strategic intent of the website, or system, from the business requirements and client expectations 1.2 Provide direction in order to develop the information requirements, based on the business and client requirements 1.3 Synthesise the required information, and group it into business schemes related to the business structure 1.4 Direct the determination of content requirements for each process
2. Contribute to the description of the system and transmission media	2.1 Consult with network and system specialists 2.2 Critically analyse the features of the physical environment, to interface with the information system architecture 2.3 Estimate the traffic content and volumes, based on the business requirements
3. Supervise the development of content structure and navigation plan	3.1 Organise the information into related topics 3.2 Ensure that the information hierarchy is in a valid sequence 3.3 Provide direction for clear, valid and intuitive labelling 3.4 Review and commit to the feasibility of architecture design 3.5 Develop the acceptance criteria
4. Implement the navigation system development	4.1 Coordinate the fit of navigational systems with the business requirements 4.2 Supervise the development of navigational search subsystems 4.3 Lead the development of consistent, and logical, labelling systems
5. Finalise the testing and accept the information architecture model	5.1 Lead the construction of an information architecture prototype 5.2 Ensure that a broad sample of business clients are engaged 5.3 Ensure that the site content meets the business needs 5.4 Lead the testing of the information architecture prototype, to test that it operates on the chosen system, and transmission media

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ELEMENT	PERFORMANCE CRITERIA
	5.5 Supervise the user-acceptance test

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 2.2, 2.3, 3.1, 3.2, 3.4, 4.1, 5.3, 5.4	• Organises, evaluates and critiques ideas, and information, from a wide range of complex texts • Draws on a broad range of strategies, to build and maintain understanding throughout complex texts
Writing	1.2, 1.3, 2.3, 3.2, 3.3, 3.5	• Selects the structure, language, grammar and terminology to suit the specific subject matter and audience, in order to develop a wide variety of documentation and directions, including direction for the content requirements, information hierarchy, navigational search subsystems, labelling systems and user-acceptance test
Oral Communication	1.1-1.4, 2.1, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.4, 5.5	• Uses effective listening and probing, open questioning techniques to elicit the view and opinions of others, and to obtain information • Employs plain English to convey complex and abstract concepts, and information • Articulates requirements and strategies clearly, in a courteous manner, using the appropriate pitch, tone, body language and reflective responses
Navigate the world of work	1.1, 1.2, 1.3, 2.3, 3.3	• Takes a lead role in the development of organisational goals, roles and responsibilities
Get the work done	1.1, 1.3, 1.4, 2.2, 3.1, 3.2, 3.4, 4.1, 4.2, 4.3, 5.1, 5.4	• Develops flexible plans for complex, high-impact activities with strategic implications • Takes responsibility for high-impact decisions in complex situations, involving many variables and constraints • Keeps abreast of innovations and good practice beyond own context, borrowing, adapting, combining and redesigning for own purposes, or using as a provocation to rethink current approaches • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot, and understands the uses and potential of new technologies

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT811 Manage an information architecture project	ICAICT711A Manage an information architecture project	Updated to meet Standards for Training Packages. Recoded and minor changes to Performance Criteria to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT811 Manage an information architecture project

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the strategic and business intent of the website or system
- conduct business meetings, applying effective communication techniques
- research and determine the essential requirements of a product, applying quality management principles
- describe the features of the website or system
- develop the navigation system
- construct an information architecture prototype
- test the prototype with the operating system and the transition media
- supervise the user acceptance test.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- examine the equity and diversity principles relevant to information architecture projects
- research and critique organisational policies and procedures, as they apply to the project
- determine and outline the public sector legislation, codes of practice and other formal agreements, that directly impact on the business operations
- evaluate the components of telecommunications networks
- research and synthesise the workplace, and industry environment, as it applies to information architecture.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- the computer system and a web-host workplace

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTICT812 Develop a business intelligence framework

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge to evaluate the business intelligence (BI) requirements of an organisation, and to select the correct methodologies to develop a BI solution.

It applies to individuals who work in high-level management positions and lead the analysis, implementation and management of emerging, and converging, information and communications technology (ICT) as they are integrated into the business process, to support the organisational strategic goals of medium to large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Elicit the business intelligence requirements	1.1 Articulate the benefits of business intelligence 1.2 Select the appropriate system development methodology, through the analysis of a range of options 1.3 Critically evaluate the impact of business intelligence on the enterprise 1.4 Select the appropriate business model for a data repository 1.5 Adopt a metadata standard for the enterprise 1.6 Establish the appropriate data analysis techniques
2. Direct the business intelligence data manipulation	2.1 Identify the data sources and scope 2.2 Evaluate and endorse the selected data-manipulation methods 2.3 Critically review, and commit to, the feasibility of the architecture design 2.4 Develop the acceptance criteria 2.5 Endorse the selected data-modelling techniques and processes 2.6 Endorse a load balancing algorithm for optimum processing 2.7 Sign off the design specifications
3. Endorse the business intelligence solution architecture	3.1 Ensure that the data-warehousing management techniques and processes are according to the specifications 3.2 Lead the scoping of logical data models 3.3 Supervise the selection of middleware tools 3.4 Critically review, and commit to, a searchable data repository solution
4. Finalise the testing and accept the framework	4.1 Finalise the physical data model 4.2 Complete testing of the overall model 4.3 Test the security 4.4 Test the integrity 4.5 Perform a user-acceptance test

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 1.6, 2.1, 2.3, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 4.1	• Organises, evaluates and critiques ideas, and information, from a wide range of complex texts • Draws on a broad range of strategies to build and maintain understanding throughout complex texts
Writing	1.1, 1.3, 1.6, 2.4, 2.7, 4.1, 4.5	• Integrates information and ideas from a number of sources, utilising the appropriate BI software tools, specialised and cohesive language, and appropriate document structures, to meet the varied requirements of the organisation and the task
Oral Communication	1.1, 2.1, 2.2, 2.3, 2.5, 2.6, 3.2, 3.3, 3.4, 4.5	• Elicits information and ideas using plain English, translating BI specific terminology when necessary, and using effective listening and questioning techniques • Uses specific and complex BI terminology, to liaise with team members, review and endorse methodology and monitor the project • Articulates the requirements and methodologies clearly, using the appropriate tone, style, body language and reflective responses
Numeracy	1.1, 1.3, 1.4, 1.6, 2.3, 2.4, 2.5, 2.6, 2.7, 3.2, 3.4, 4.1, 4.2, 4.5	• Uses a range of complex statistical, mathematical and financial calculations, formulae and functions together with the appropriate BI software tools, in the development of a BI framework
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.2, 3.3, 4.2, 4.3, 4.5	• Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to develop a BI framework • Recognises the critical importance of clarifying, focusing and aligning goals, and expectations, using the process to build ownership of, and broad commitment to, achieving outcomes • Takes responsibility for high-impact decision in complex situations, involving many variables and constraints

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT812 Develop a business intelligence framework	ICAICT712A Develop a business intelligence framework	Updated to meet Standards for Training Packages. Recoded and minor changes to Performance Criteria to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT812 Develop a business intelligence framework

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and critically analyse the business intelligence requirements
- review, analyse and direct, business intelligence data manipulation
- review, critically analyse and endorse, the proposed business intelligence solution architecture
- initiate and contrast the tests required for the intelligence framework, for final acceptance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- evaluate the application of system development methodologies and other technical considerations including:
  - managing and using metadata
  - data modelling
  - data warehousing/back-end software alternatives
  - business analytics
  - business intelligence tools
- analyse the organisational policies and procedures, as they apply to the business intelligence frameworks
- discuss behaviour theories as they apply to business intelligence, including:
  - responsibility and achievement
  - affiliation management
  - motivation
- appraise and evaluate, the business intelligence (BI) procedures
- interpret the workplace and industry environmental conditions, as they apply to business intelligence.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a business intelligence focus
- relevant enterprise documentation, including human resource (HR) and quality management policies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTICT813 Manage ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply the principles of service quality management and to develop a code of practice for information and communications technology (ICT) service management.

It applies to individuals who work in senior management positions and manage a wide range of ICT projects, and lead the analysis, implementation and management of emerging, and converging, ICTs as they are integrated into the business process to support organisational strategic goals.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to manage ICT services	1.1 Identify the quality requirement principles to provide ICT service provision, according to the business needs and expectations 1.2 Research and critically analyse, the appropriate service processes 1.3 Analyse continual improvement processes, to align and realign, the ICT services to business needs
2. Develop the quality requirements for ICT service management	2.1 Identify the specific quality requirements to improve the service management processes 2.2 Align ICT services with the business, applying service management concepts 2.3 Develop the strategies for the control, delivery and support of ICT services
3. Develop a code of practice for ICT service management	3.1 Research and critically analyse, best practice processes 3.2 Document best practice processes for ICT service management 3.3 Implement the identified best practice processes 3.4 Evaluate, monitor and improve ICT service management

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 3.1, 3.4	• Identifies, analyses and critically evaluates, complex online and hard copy documentation containing service-management and technology-specific terminology, in order to research, develop, monitor and improve, a quality service management process
Writing	2.2, 2.3, 3.2, 3.4	• Uses plain English, the appropriate grammatical structures and terminology, diagrams and flow charts, and the formatting, and document structure, relevant to the subject matter and audience, to develop strategies and best practice processes
Oral Communication	1.1-1.3, 2.1-2.3, 3.1, 3.3, 3.4	• Expresses research and resource requirements clearly, and directs discussions to elicit information, and the views and opinions of others, by using effective listening and open, questioning techniques • Articulates requirements and methodologies clearly, using the appropriate tone, style, body language and reflective responses
Get the work done	1.1-1.3, 2.1-2.3, 3.1, 3.4	• Considers the strategic and operational potential of digital technology to achieve work goals, enhance work processes, create opportunities and reduce risks • Draws on a broad understanding of the context and uses a combination of analysis and intuition, to decide whether an idea is worth developing and implementing • Develops plans for complex high-impact activities with strategic implications • Recognises and addresses complex problems involving multiple variables

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT813 Manage ICT services	ICAICT713A Manage IT services	Updated to meet Standards for Training Packages. Minor edit to title. Recoded and minor changes to Performance Criteria to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTICT813 Manage ICT services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and critically analyse the provision of quality information and communications technology (ICT) services
- review, then develop and implement, procedures and processes to improve the quality of ICT service management
- critically review, evaluate, monitor and improve the ICT service management.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- review and appraise ICT service management concepts and processes
- research and critically review, the quality assurance procedures in ICT services
- discriminate and summarise, industry best practice processes in ICT services
- summarise and contrast, the technical terminology relevant to service management.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general ICT industry, and include access to:

- a current service organisational chart
- current service logs and procedures
- an organisational mission statement.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTICT814 Develop cloud computing strategies for a business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop a cloud computing strategy for establishing cloud computing services as a key business enabler.

It applies to senior management, including strategic business analysts and chief information officers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the existing business ICT system assets	1.1 Review the business assets and identify the most appropriate for possible cloud deployment 1.2 Evaluate each asset's risk tolerance to the business, for possible cloud deployment
2. Select the most suitable deployment and/or delivery model for each asset	2.1 Map each asset to potential cloud deployment models 2.2 Review and select the most relevant delivery model for each asset 2.3 Document the security risks to the business as a result of using the identified deployment and delivery models
3. Develop a cloud implementation strategy	3.1 Develop a cloud implementation plan, incorporating the most appropriate deployment and delivery models, in line with the enterprise requirements 3.2 Develop a costing for the technology requirements of the implementation proposal 3.3 Develop processes for the periodic review of the cloud service metrics, associated with the implementation proposal

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.2	• Organises, evaluates and critiques ideas and information from a range of complex texts
Writing	2.1, 2.3, 3.1	• Prepares documentation expressing ideas, explores complex issues and is constructed logically, succinctly and accurately
Numeracy	3.2	• Analyses and synthesises highly embedded mathematical information in a broad range of tasks and texts
Navigate the world of work	3.1	• Develops and implements strategies that ensures that the organisational policies, procedures and regulatory requirements are being met
Get the work done	3.1, 3.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Identifies the key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision-making strategies, where appropriate • Uses digital technologies to manage business operations and actively investigates new technologies, for strategic and operational purposes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTICT814 Develop cloud computing strategies for a business	ICAICT814A Develop cloud computing strategies for a business	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTICT814 Develop cloud computing strategies for a business

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and document, the effectiveness of existing cloud computing deployment and delivery models
- research the cloud computing options in the marketplace
- develop a cloud computing implementation strategy that meets the enterprise needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and synthesise information to determine and document current business processes, and cloud service sources
- define and employ coaching, mentoring and teamwork skills to ensure the support of cloud computing strategies as an ongoing initiative
- investigate and analyse cloud computing concepts, processes and trends
- synthesise the relevant enterprise policies and legislation that affect business operations, specifically privacy legislation
- discriminate between the legal, ethical and security issues relating to cloud computing
- evaluate organisational change-management theory and methods
- determine the risk tolerance issues, as they relate to the development of cloud computing strategies
- investigate and critically analyse, the methods of deploying cloud technology strategies
- investigate and critically analyse, the security issues relevant to a business.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the general information and communications technology (ICT) industry, and include access to:

- a workplace of sufficient complexity, to enable the required level of analysis to be carried out in relation to current business processes, and possible future cloud computing solutions
- relevant enterprise strategic documentation, including:
  - strategic planning
  - financial
  - ICT infrastructure
- enterprise objectives and policies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTICT815 Manage automated ICT system applications using enterprise wide operating system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the performance outcomes, skills and knowledge required to apply the enterprise wide operating system to system automation in a distributed computing environment as used in telecommunications applications.

It applies to telecommunication engineers who manage automated systems within a telecommunications network including databases, files systems and user administration.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

General ICT

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Elements and Performance Criteria

Elements *Elements describe the essential outcomes.*	**Performance Criteria** *Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Operate an enterprise wide operating system	1.1 Modify boot options by operating an enterprise wide operating system 1.2 Shutdown a networked operating system using system commands with qualifiers 1.3 Manage files using file management commands and wildcards and creating disk partitions and other media file systems 1.4 Mount and unmount file systems using system commands 1.5 Verify the integrity of file systems using system utilities 1.6 Configure telecommunication applications by using system commands with special permission modes 1.7 Critically analyse, evaluate and apply the enterprise wide operating system features to a given telecommunications multi-user application using distributed computing
2. Apply system functions	2.1 Use the command line interface to interact with shells and commands to the telecommunications application on distributed computing 2.2 Manage files by applying regular expressions with system functions 2.3 Send text files and output streams through text utilities using commands 2.4 Evaluate and apply enterprise wide operating system functions to a telecommunications application on distributed computing to create menu options
3. Manage user login environment and customisation	3.1 Manage user and group accounts to the telecommunications application on distributed computing 3.2 Change user and group profiles to allowed security access level using commands 3.3 Scan log files for activity using commands 3.4 Configure the user environment for setting user and global profiles 3.5 Record the configuration settings
4. Manage system level	4.1 Automate scheduling using the system ‘cron’ command

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functions	4.2 Critically analyse the need for backup strategy in a telecommunications network application 4.3 Plan a backup strategy to maintain redundancy of the system 4.4 Configure the system to perform scheduled backing up the file system to various media 4.5 Verify integrity of backup operations by restoring system using backup files 4.6 Configure system log files for administration and security needs 4.7 Manage a print server and print files to provide customer service 4.8 Document the configuration backup schedules and system logs
5. Complete evaluation and configuration documentation	5.1 Produce a project evaluation report on the application of Unix features to a given telecommunications multi-user application using distributed computing with recommendations on improvements to the system 5.2 Produce a report on the management and configuration of user applications and system level functions

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Foundation Skills

This section describes language, literacy and numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.7, 2.4, 3.3, 4.2	• Evaluates and critiques ideas and information from a range of complex texts
Writing	2.4, 3.5, 4.2, 4.8, 5.1, 5.2	• Generates complex written texts demonstrating sophisticated writing skills
Oral Communication	4.2, 5.1, 5.2	• Presents complex and effective spoken communication in a broad range of contexts
Numeracy	1.6, 3.4, 3.5, 4.2, 4.4, 4.6	• Applies a wide range of highly developed mathematical and problem solving strategies and techniques to a wide range of contexts
Get the work done	1.1-1.7, 2.1-2.4, 3.1-3.4, 4.1-4.7, 5.2	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Makes high impact decisions in a complex and diverse environment, using input from a range of sources • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision making strategies where appropriate • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisations goals • Uses digital technologies to manage business operations and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalent status
ICTICT815 Manage automated ICT system applications using enterprise wide operating system	ICTITU7106B Manage automated ICT system applications using Unix	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTICT815 Manage automated ICT system applications using enterprise wide operating system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- manage ICT system functions using a enterprise wide operating system
- analyse system functions based on data
- produce a report on the evaluation of the system
- document recommendations for improvement

Knowledge Evidence

Evidence of the ability to:

- analyse an automated systems
- critique communication and multi user telecommunications systems
- appraise distributed computing
- appraise encoding and programming techniques
- analyse and report on network security
- describe networking infrastructure
- describe realisation of software simulation
- apply enterprise wide operating system commands.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the Telecommunications -Information Technology field of work and include access to:

- a telecommunications operations site
- unix based system to manage automated functions
- special purpose tools, equipment, materials
- industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK301 Provide network systems administration

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to technically manage the elements of a network, including contributing to a disaster recovery plan.

It applies to individuals working as frontline technical support personnel responsible for administering a network.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Provide client access and security	1.1 Provide logons, passwords and applications file access to users, and prepare the documentation in line with organisational requirements 1.2 Examine the records of user accounts, to determine access privileges and usage 1.3 Take the necessary action to ensure the maintenance of system integrity and security
2. Provide the input into and disseminate the disaster recovery plan	2.1 Provide input into the organisation's disaster recovery plan 2.2 Disseminate the disaster recovery plan to users, as required
3. Monitor the network performance	3.1 Perform the diagnostic tests associated with administering the network or system 3.2 Analyse and respond to diagnostic information 3.3 Monitor software usage, including any inappropriate or illegal use 3.4 Delete any illegal software from the system 3.5 Monitor the hardware response time, and other performance indicators 3.6 Determine and action, methods for improving the network and systems efficiency, according to the organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.6	• Recognises and interprets textual information from organisational guidelines to establish the job requirements
Writing	1.1	• Uses specific and relevant language to complete workplace documentation
Oral Communication	1.1, 2.1	• Articulates information clearly, using specific and relevant language suitable to the audience, to convey requirements, and listening and questioning techniques, to confirm understanding
Numeracy	3.2	• Interprets numerical data to monitor network operations
Interact with others	2.2	• Selects the appropriate form, channel and mode of communication for a specific purpose, relevant to own role
Get the work done	1.3, 3.1, 3.2, 3.3, 3.6	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems, and tools, and operates them effectively to complete routine tasks • Responds to highly obvious routine problems, using step by step instruction and procedures, or by a trial and error process, for non-critical situations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK301 Provide network systems administration	ICANWK301A Provide network systems administration	Updated to meet Standards for Training Packages.	Equivalent unit

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Assessment Requirements for ICTNWK301 Provide network systems administration

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- sustain the operation of the network through the maintenance of network integrity, and by performing diagnostic tests
- contribute to the formulation of a disaster recovery plan, and provide the client with an optimised network that complies with the organisational guidelines
- implement network and systems efficiency, according to organisational guidelines
- provide the appropriate access to the network for users
- maintain, limit or enhance user access, according to authorised requests.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the network's operating system
- outline the different approaches to backing-up, and restoring, computer data
- describe the key elements contained in a disaster recovery policy
- describe the features of network file and folder permissions
- outline the vendor service-level agreement
- summarise operating systems supported by the organisation, their functions and basic features
- outline the organisation's access and security procedures
- identify and describe the organisational and technical systems
- describe the organisational procedures for protection against, and elimination, of computer viruses
- describe the policies and procedures for deleting, restoring and archiving files
- describe the procedures for creating logons
- outline the security, and network, guidelines and procedures
- state the responsibilities for software copyright.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a live network
- systems administration tools currently used in the industry
- the organisational policy and procedures

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK302 Determine and action network problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to document network related problems, determine solutions, or escalate problems to a new support level.

It applies to individuals, working as frontline technical support personnel, who maintain network continuity by isolating and rectifying network problems as they arise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine client requirements and identify if problem exists	1.1 Log calls from help-desk support staff 1.2 Determine and document problem based on client requirements
2. Determine whether problem is covered by policy	2.1 Verify the scope and coverage of maintenance and technical support agreements relative to the problem and client requirements 2.2 Provide assistance according to organisational guidelines
3. Carry out maintenance support on identified problem	3.1 Conduct diagnostic tests around identified problem 3.2 Complete maintenance according to organisational guidelines 3.3 Obtain new components as part of the resolution, where necessary 3.4 Store or dispose of components according to organisational and environmental guidelines
4. Prepare maintenance report and confirm solution	4.1 Prepare maintenance report according to organisational guidelines and support agreements 4.2 Refer unresolved maintenance requirements to appropriate higher level service area 4.3 Follow up with the client to determine solution success and close the report

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 3.2, 3.4, 4.1	• Recognises and interprets textual information from organisational guidelines and support agreements to establish the job requirements
Writing	1.1, 1.2, 4.1	• Uses industry-specific language to document problems and prepare maintenance reports in line with organisational guidelines and support agreements
Oral Communication	4.2, 4.3	• Provides clear explanations using language suitable to audience to discuss unresolved challenges • Uses listening and questioning techniques to confirm understanding
Navigate the world of work	2.2, 3.4	• Complies with explicit organisational policies and procedures
Get the work done	1.2, 2.1, 2.2, 3.1-3.4, 4.3	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • May reflect on outcomes and identify what worked, or develop an improved approached for future situations • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context and seeks input from others when problems remain unresolved

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK302 Determine and action network problems	ICANWK302A Identify and resolve network problems	Updated to meet Standards for Training Packages. The title has been edited to correct the wording to that of the original competency intent.	Equivalent unit

Links

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Assessment Requirements for ICTNWK302 Determine and action network problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document network related problems and determine the required resources
- solve client problems or escalate the problem according to organisational guidelines
- maintain the network with minimal disruption to clients.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain environmentally sound recycling and disposal procedures
- identify and summarise common networking procedures for:
  - call logging
  - contracting and maintenance requirements
  - problem escalation procedures
- outline inventory processes
- describe technical features and functions of network hardware and software systems
- describe common network problems relating to organisational information
- describe agreements used for technical support.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a network
- hardware
- diagnostic tools, components and software
- records and reports
- organisational guidelines and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK303 Configure and administer a network operating system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit defines the skills and knowledge required to create the network configuration required by a client and to set up and use administrative tools to manage the network.

It applies to individuals working as frontline technical support personnel who are required to maintain network continuity through changing requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess network features	1.1 Determine organisational policies and administration arrangements used to administer the network 1.2 Determine the type of network operating system (NOS) and interfaces used by the existing network and potential compatibility issues caused by integration of other networks 1.3 Identify the risks associated with administration of a network to minimise the loss of data or service during operations 1.4 Determine network administration tools that can be used with the NOS to manage network performance and enforce organisational policies
2. Administer and support the system using administration interfaces	2.1 Use interfaces to format hard drives, set up security restrictions and establish user log-in information to administer a basic network 2.2 Use administration tools to develop a map of system interaction to determine the data required by particular users and how often the data is accessed 2.3 Examine existing applications and software, and plan required upgrades or reconfigurations to new system or applications 2.4 Test reconfiguration for successful interface with existing system to ensure compatibility
3. Set up and manage the network file system	3.1 Create a required file and folder structure using appropriate administration and system tools 3.2 Set the security, access and sharing of file system to meet user requirements 3.3 Identify and implement the virus protection requirements for the network in line with organisational procedures 3.4 Test and document the file system to ensure that appropriate access is available to the user groups according to organisational standards
4. Administer user services and user accounts	4.1 Determine the user services required, and implement using the appropriate administration and system tools 4.2 Create users and groups as required to facilitate user

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ELEMENT	PERFORMANCE CRITERIA
	security and network access according to user authorisation 4.3 Verify successful access by users to authorised network data and resources, and record outcomes 4.4 Set or modify user settings to ensure compliance with security and access policies 4.5 Review procedures and take action to ensure that users who are no longer part of the organisation have their accounts disabled, deleted or modified
5. Provide and support backup security	5.1 Scan and clean the network of viruses before performing backup of the network 5.2 Determine security risks to which data is exposed and provide appropriate prevention methods and recovery processes 5.3 Report identified security risks to appropriate person 5.4 Implement systems to provide backup and service restoration capability in the event of a disaster, according to organisational policies 5.5 Document and disseminate the disaster recovery procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 3.2-3.4, 4.4, 4.5, 5.4	• Recognises and interprets information from organisational policies and procedures to establish the job requirements
Writing	3.4, 4.3, 5.5	• Uses specific and relevant language to document new file systems, user access and disaster recovery procedures
Oral Communication	5.3	• Articulates information clearly using specific and relevant language suitable to audience to convey requirements, and uses listening and questioning techniques to confirm understanding
Navigate the world of work	1.1, 3.3, 5.4	• Complies with explicit organisational policies and procedures
Interact with others	5.3, 5.5	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.1-1.4, 2.1-2.4, 3.1-3.4, 4.2-4.5, 5.1, 5.2, 5.4	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • May reflect on outcomes and identify what worked, or develop an improved approached for future situations • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context and seeks input from others when problems remain unresolved

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK303 Configure and administer a network operating system	ICANWK303A Configure and administer a network operating system	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK303 Configure and administer a network operating system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use network administrative tools to carry out system administration tasks
- manage the network file system
- create the network configuration required by the client
- provide user services and user accounts
- provide backup and service restoration capability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe antivirus software, its operation, installation and update procedures
- summarise current industry standard network operating system (NOS)
- outline the facilities available in the operating environment
- describe the features and capabilities of networking technologies
- explain the implementation of network security in a local area network (LAN) including:
  - file and folder permissions
  - users and group settings
- provide a summary of monitoring aspects of network performance or traffic including:
  - system administration tools
  - third-party tools.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- user network requirements
- antivirus software
- network administration tools
- a live network with a representative range of networked environments and operating systems
- a server
- technical records, organisational policies, access policy and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK304 Administer network peripherals

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage an environment of networked peripheral devices, in order to provide services to client users.

It applies to individuals working as frontline technical support personnel responsible for connecting, maintaining and administering peripheral devices attached to networks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Install peripherals to a network	1.1 Plan the location of peripherals to provide appropriate services to users and to take work health and safety (WHS) standards into consideration 1.2 Connect peripherals to network, using vendor approved method and technology 1.3 Connect peripherals to computers in the network using parallel, serial or other direct connection methods 1.4 Add peripheral accessories or upgrades to printer, such as memory or high-volume paper trays 1.5 Test peripherals for correct operation
2. Configure peripheral services to manage peripherals	2.1 Install software required to manage local and network connected peripherals 2.2 Use meaningful names for peripherals and control queues 2.3 Configure security and access to allow appropriate users to make use of peripherals 2.4 Configure workstation for peripherals to allow applications to work with peripherals
3. Administer and support peripheral services	3.1 Assign priority to control queues 3.2 Use peripheral management software supplied as part of the network operating system (NOS) or by third parties 3.3 Create templates for use on the network 3.4 Configure settings on the network to create maintenance schedules, usage logs, and cost centre usage statistics 3.5 Demonstrate to the user the methods for using peripheral services from their application or workstation
4. Maintain peripherals and fix common problems	4.1 Establish and follow a regular maintenance schedule as recommended by peripheral manufacturer 4.2 Replace consumables and components when required 4.3 Fix peripheral mishaps and malfunctions 4.4 Monitor peripheral usage and traffic and recommend additional peripherals if needed 4.5 Determine failures of peripheral services or devices and

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ELEMENT	PERFORMANCE CRITERIA
	rectify as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.1	• Recognises and interprets textual information from manufacturers guidelines to establish and follow a regular maintenance schedule
Writing	2.2, 4.1	• Uses specific and relevant language when naming a peripheral device or creating new profiles
Oral Communication	3.5	• Articulates information clearly using specific and relevant language suitable to audience to convey information • Uses listening and questioning techniques to confirm understanding
Navigate the world of work	1.1	• Takes personal responsibility for adherence to legal/regulatory responsibilities relevant to own work context with specific reference to work health and safety (WHS) requirements
Interact with Others	3.5	• Uses a limited range of accepted practices for communicating in a work environment • Recognises common cultural and other differences of people in the work context and makes adjustments in addressing these differences
Get the work done	1.1, -1.5, 2.1- 2.4, 3.1-3.5, 4.2-4.5	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and takes responsibility for addressing predictable and some less predictable problems, including equipment services or devices malfunctions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK304 Administer network peripherals	ICANWK304A Administer network peripherals	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK304 Administer network peripherals

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and install peripherals
- connect and test peripherals to network
- manage the use of peripheral services with workstations
- maintain networked peripherals according to a maintenance schedule
- rectify faulty peripheral services or devices.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe common network peripherals and their configuration
- identify and summarise current industry standards for network peripherals
- outline the general construction and operation of peripheral devices to facilitate troubleshooting.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry and include access to:

- a range of peripherals
- network administration tools
- a live network with a representative range of networked client server environments and operating systems
- technical records, organisational policies and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK305 Install and manage network protocols

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install and manage network protocols in a networking environment.

It applies to individuals with competent information and communications technology (ICT) skills, working as network administrators who are required to ensure that appropriate protocols have been installed in networks to allow user functionality and maintenance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Install and manage network protocols	1.1 Select, test and validate appropriate network protocol services 1.2 Design a network addressing system, with subnet and host IDs, including appropriate devices 1.3 Configure hosts and workstations to use IP addresses either manually or through automatic allocation of addresses, such as found with dynamic host configuration protocol (DHCP)
2. Identify network protocol applications	2.1 Review a range of well-known network protocol applications 2.2 Evaluate client user requirement and recommend network protocol services 2.3 Apply internet protocol (IP) addressing scheme according to approved policy and procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 2.3	• Recognises and interprets textual information, including technical manuals, to establish the job requirements
Writing	2.2	• Uses specific and relevant language to document new file systems, user access and disaster recovery procedures
Oral Communications	2.2	• Articulates clearly using specific and relevant language suitable to audience to convey requirements • Uses listening and questioning techniques to confirm understanding
Navigate the world of work	2.3	• Complies with explicit organisational policies and procedures • Ensures knowledge of legislative requirements and products is kept up to date
Get the work done	1.1-1.3, 2.1	• Takes responsibility for planning and organising own workload, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when developing and refining configuration protocols

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK305 Install and manage network protocols	ICANWK305A Install and manage network protocols	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK305 Install and manage network protocols

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- configure, test and validate network protocols in order to facilitate interconnectivity
- install and manage network protocols in a network, and troubleshoot problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain, including client organisation structure and business functionality
- list current communications technologies and their associated protocols
- outline current industry accepted hardware and software products, and general features and capabilities
- summarise network protocols currently in use in the organisation and industry, including:
  - transmission control protocol
  - internet protocol (TCP/IP)
  - OSI models
- clarify the vendor product range and development directions
- describe how network protocols transcend organisational size and network complexity.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a live network
- application software and operating system
- appropriate learning and assessment support when required
- networked computers
- organisational guidelines
- technical documentation and installation manuals
- vendor software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK306 Evaluate characteristics of cloud computing solutions and services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to recognise cloud computing characteristics in order to evaluate them. It involves a basic review and analysis of cloud computing delivery, and deployment models, and an evaluation of the benefits and challenges of implementing cloud computing solutions and services.

This unit applies to those engaged in the basic review of a cloud computing solution for an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to review cloud technology solutions and services	1.1 Identify the common terminology, characteristics, major industry technology standards and concepts of cloud computing solutions and services 1.2 Identify the major organisational roles affected by cloud computing solutions and services 1.3 Identify the key business requirements most suitable for transferring to cloud computing solutions and services
2. Identify the differences between cloud delivery models	2.1 Identify the characteristics associated with different cloud delivery models 2.2 Identify any other emerging cloud delivery models 2.3 Evaluate the advantages, and disadvantages, of combining different cloud delivery models
3. Review the performance of different types of cloud deployment models	3.1 Identify the characteristics associated with different cloud deployment models 3.2 Identify any other emerging cloud deployment models 3.3 Evaluate the advantages and disadvantages, of combining different deployment models
4. Evaluate the benefits and challenges of using cloud computing solutions and services	4.1 Identify the possible benefits of adopting cloud solutions and services 4.2 Identify the possible challenges of adopting cloud solutions and services 4.3 Review and document, the impact of implementing a cloud delivery model 4.4 Provide feedback to the appropriate personnel

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.2, 3.1-3.3, 4.1-4.3	• Analyse and consolidates information, and data, from a range of sources against the defined criteria and requirements, and checks for accuracy and completeness
Writing	4.3, 4.4	• Accurately records information and prepares correspondence and documentation, using clear language and organisational formats, and protocols
Oral Communications	4.4	• Selects and uses the appropriate strategies to establish and maintain spoken communication, in familiar, and some unfamiliar, contexts • Derives meaning from a range of oral texts in familiar, and some unfamiliar, contexts
Get the work done	All	• Plans and implements routine tasks and workload, making limited decisions on sequencing, timing and collaboration, and seeks assistance in setting priorities • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions, and evaluates the effectiveness of the outcome • Identifies ideas for other applications and considers them in current contexts

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK306 Evaluate characteristics of cloud computing solutions and services	ICANWK306A Evaluate characteristics of cloud computing solutions and services	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK306 Evaluate characteristics of cloud computing solutions and services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- collate the information on the organisation's need for cloud technology
- identify the key differences, and the performance, in cloud technology models
- determine the most appropriate cloud computing solution for the business
- provide feedback on the most appropriate cloud computing solution and service.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the current technology trends, and directions, in information and communications technology (ICT)
- identify the major industry technology standards used in cloud computing solutions and services
- recognise the vendor product directions in cloud computing solutions and services
- describe the current industry hardware and software products, and their general features, capabilities and application
- describe the principles of cloud computing solutions and technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- information on the cloud computing solution technologies currently used in the industry
- the business requirements
- documents detailing work health and safety (WHS) standards, environmental guidelines, and enterprise requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK401 Install and manage a server

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install and manage a server. Server management includes initial configuration and testing, ongoing administration, software distribution and updates, profiling and monitoring servers, and troubleshooting.

It applies to individuals with competent information and communications technology (ICT) skills, employed in network management or server administration roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to install a server	1.1 Prepare for work, according to site specific safety requirements and enterprise workplace health and safety (WHS) processes and procedures 1.2 Obtain server applications and features from appropriate person 1.3 Choose most suitable operating system features and network services with reference to required server solution and technical requirements 1.4 Review required installation options 1.5 Analyse data migration requirements 1.6 Back up local data in preparation for installation 1.7 Arrange access to site and advise client of deployment and potential down time
2. Install server as required by the specification	2.1 Create disk partitioning scheme 2.2 Create file systems and virtual memory 2.3 Install network operating system 2.4 Install and configure server applications and network services 2.5 Reconnect and reconfigure connectivity devices 2.6 Patch the operating system and applications to ensure maximum security and reliability 2.7 Restore local data to new server
3. Configure and administer the server	3.1 Configure network directory service 3.2 Create and manage accounts to facilitate security and network access 3.3 Configure user environment using operating system policies and scripts 3.4 Create directory structure and quotas to meet client requirements 3.5 Configure and manage print services 3.6 Set the security, access and sharing of system resources to meet client requirements

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ELEMENT	PERFORMANCE CRITERIA
	3.7 Implement security policy to prevent unauthorised access to the system 3.8 Implement backup and recovery methods to enable restoration capability in the event of a disaster 3.9 Configure update services to provide automatic updates for operating system and applications
4. Monitor and test the server	4.1 Test server for benchmarking against client specification and requirements according to test plan, and record outcomes 4.2 Analyse the error report and make changes as required 4.3 Use troubleshooting tools and techniques to diagnose and correct server problems 4.4 Test required changes or additions 4.5 Validate changes or additions against specifications
5. Complete documentation and clean up worksite	5.1 Make and document server configuration and operational changes 5.2 Complete client report and notification of server status 5.3 Clean up and restore worksite to client's satisfaction 5.4 Secure sign-off from appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 3.3, 4.2	• Recognises and interprets technical documentation to determine job requirements
Writing	4.1, 4.2, 5.1, 5.2	• Uses clear, specific and industry related terminology to produce and update workplace documentation
Oral Communication	1.2, 1.7	• Articulates information clearly using specific and relevant language suitable to audience to convey information • Uses listening and questioning techniques to confirm understanding
Numeracy	1.5, 4.2	• Uses mathematical formulae to take test measurements, interpret results and evaluate performance and interoperability of the network
Navigate the world of work	1.1, 5.3	• Takes personal responsibility for adherence to legal/regulatory responsibilities relevant to own work context • Understands nature and purpose of own role and associated responsibilities, and how it contributes to the work of others in the immediate work context
Interact with others	5.4	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.3, 1.4, 1.6, 1.7, 2.1-2.7, 3.1-3.9, 4.1, 4.3, 4.4, 4.5, 5.1	• Determines job priorities, resources and equipment, and works logically and systematically to undertake clearly defined and familiar tasks • Implements actions according to a predetermined plan, making slight adjustments if necessary • Takes responsibility for routine decision making by selecting from a range of predetermined options in routine situations, identifying and taking some situational factors into account • Initiates standard procedures when adapting configuration procedures, depending on differing operational contingencies, risk situations and environments

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		• Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks, adapting some functions to improve personal efficiency

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK401 Install and manage a server	ICANWK401A Install and manage a server	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK401 Install and manage a server

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install and configure server
- configure network connectivity
- manage the server operating system, including user accounts, file, network directory and print services
- perform backup and recovery
- update operating system and software
- monitor and test server
- troubleshoot server and network failures.

Candidates should demonstrate competency in at least TWO different network operating systems.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe current network hardware and software systems and their requirements, including:
  - network operating systems (NOS)
  - server applications including compatibility issues and resolution procedures
  - desktop applications and operating systems
- recognise and describe basic server installation and maintenance processes and procedures, including:
  - documentation skills for networks
  - error logging and reporting
  - high availability options for file systems, including redundant array of independent disks (RAID) and replication
  - network directory services and network service configuration
  - options for performance tuning
  - user authentication
- specify and describe processes and procedures required to support and manage a server, including:
  - best practice for implementing backup and recovery procedures
  - boot process
  - operating system help and support utilities
  - operating system installation methods, including installation from CD or DVD, universal serial bus (USB) boot disk, network and script (automated install)
  - printer management
  - process and task management, including process termination
  - task scheduling utilities
  - troubleshooting tools and techniques, including network diagnostic utilities
  - user account and password management.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where server installation may be conducted
- relevant server specifications including:
  - cabling
  - local area networked (LAN) computers
  - server diagnostic software
  - switch
  - client requirements
- wide area network (WAN) service point of presence
- workstations
- relevant regulatory documentation that affects installation activities.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK402 Install and configure virtual machines for sustainable ICT

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and implement virtualisation technologies with the goal of providing a more sustainable information and communications technology (ICT) environment.

It applies to individuals who work in the network area of organisations and are responsible for the use of virtual machines to increase sustainability.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify virtualisation benefits and features	1.1 Research and determine government and industry guidelines and policies for use of desktop and server virtualisation 1.2 Identify benefits of virtualisation of desktop and server environments 1.3 Identify available features of current virtualisation software 1.4 Select virtualisation solution based on current and future needs of the client
2. Install and configure virtualisation software	2.1 Identify, clarify and organise requirements of the client relating to virtualisation technologies, following organisational requirements 2.2 Identify hardware, software and infrastructure components required to be installed and configured to meet technical requirements 2.3 Install and configure software to provide support for virtualisation of desktop and server operating systems 2.4 Configure virtualisation software application features to accommodate required functionality, relating to client and business needs
3. Install and configure virtual machines	3.1 Install virtual machine consistent with client, commercial and business requirements 3.2 Configure virtual machine consistent with client, commercial and business requirements 3.3 Test functionality of installed virtual machine
4. Configure virtual networks of virtual machines	4.1 Configure internet protocol (IP) addressing to match chosen network configuration 4.2 Configure virtual network as host only configuration 4.3 Configure virtual network as bridged configuration 4.4 Configure virtual network as network address translation (NAT) configuration 4.5 Configure services to operate under current network configuration 4.6 Test functionality of virtual network configuration

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ELEMENT	PERFORMANCE CRITERIA
5. Back up and restore virtual machines	5.1 Back up virtual machine state on shutdown 5.2 Restore state on start-up of virtual machine 5.3 Back up virtual hard drive and software configuration files 5.4 Restore virtual hard drive and software configuration files

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1, 3.2	• Recognises and interprets industry and government guidelines and organisational policy to determine job requirements
Oral Communication	1.4, 2.1	• Elicits information and client business needs by using listening and questioning techniques
Navigate the world of work	2.1	• Complies with explicit organisational policies and procedures
Get the work done	1.2-1.4, 2.1, 2.3, 2.4, 3.1-3.3, 4.1-4.6, 5.1-5.4	• Determines job priorities, resources and equipment, and works logically and systematically to undertake clearly defined and familiar tasks • Takes responsibility for routine decision making by selecting from a range of predetermined options in routine situations, identifying and taking some situational factors into account • Initiates standard procedures when adapting configuration procedures, depending on differing operational contingencies, risk situations and environments • Understands key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology and when seeking to understand the potential impact of new technology • In familiar contexts, responds promptly and intuitively to problems involving virtualised machine environments requiring immediate attention

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK402 Install and configure virtual machines for sustainable ICT	ICANWK402A Install and configure virtual machines for sustainable ICT	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK402 Install and configure virtual machines for sustainable ICT

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply sustainability practices related to current information and communications technology (ICT) network design
- research, identify and develop a virtual machine environment
- implement and maintain a virtual machine environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the current government and industry policies and guidelines related to developing sustainable ICT environments
- identify and describe current technologies and processes designed to produce a sustainable ICT environment
- state the available tools and software applications required to manage virtual machines
- define the structure, function and business organisation of client
- outline the configuration of software applications required to manage virtual machines
- describe the configuration requirements required to integrate virtual machines into an existing network design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype where virtual machine environments may be implemented
- network technical requirements
- software tools to support implementation of virtual machines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK403 Manage network and data integrity

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead the development of asset protection processes, determining threats and implementing controls to mitigate risk.

It applies to individuals working as middle managers including information security managers, network engineers and network technicians who are responsible for implementing and managing the organisational disaster recovery and asset protection policy and procedures.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Ensure compliance with company network and security policies	1.1 Review company security policies 1.2 Audit and record security access 1.3 Ensure user accounts are controlled 1.4 Ensure secure file and resource access
2. Conduct audit on system assets	2.1 Use appropriate tools and techniques to conduct audit on system hardware and software assets 2.2 Develop a system to record assets 2.3 Use system to develop reports on assets for management
3. Implement an antivirus solution	3.1 Research appropriate antivirus and anti-malware solutions 3.2 Implement antivirus or anti-malware solution 3.3 Test antivirus and anti-malware solution functionality
4. Implement systems to protect assets from threats	4.1 Determine environmental threats to data 4.2 Document systems to protect from environmental threat 4.3 Implement system to protect data from environmental threat
5. Develop a backup solution	5.1 Determine appropriate backup type to meet systems needs 5.2 Investigate current backup media options 5.3 Implement a backup solution 5.4 Demonstrate functionality of backup solution 5.5 Demonstrate restore of data from backup media 5.6 Implement a real time backup and data sync solution
6. Monitor network performance	6.1 Determine available network performance monitoring tools 6.2 Implement network performance monitoring tools to monitor network 6.3 Produce report on network performance

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1	• Interprets textual information from relevant sources to identify software solutions and adherence to company security policies
Writing	1.2, 2.2, 2.3, 4.2, 6.3	• Develops material for a specific audience, using clear and detailed language in order to convey explicit information, requirements and recommendations
Navigate the world of work	1.1	• Complies with explicit organisational policies and procedures
Get the work done	1.2, 1.3, 2.1-2.3, 3.2, 3.3, 4.1, 4.3, 5.1-5.6, 6.1, 6.2	• Determines job priorities, resources and equipment, and works logically and systematically to undertake clearly defined and familiar tasks • Takes responsibility for routine decision making by selecting from a range of predetermined options in routine situations, identifying and taking some situational factors into account • Initiates standard procedures when applying solutions in networks, including systems management processes, and deploys rapid solutions to problems involving management of network assets • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Understands the importance of secure information and privacy, and takes personal responsibility for identifying and managing risk factors

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Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Security policies must include:	• data security • physical security • remote access • user logon.

Tools must include:	• hardware and software audit tools, including:
	  • MSINFO32
	  • DXdiag
	  • Microsoft Software Inventory Analyzer (MSIA)
	  • E-Z Audit
	• hardware and software logs.

Backup type must include:	• copy • differential • folder and drive synchronisation • full and normal incremental • redundant array of independent disks (RAID).

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK403 Manage network and data integrity	ICANWK403A Manage network and data integrity	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK403 Manage network and data integrity

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify user access control issues
- use appropriate tools to conduct audit on system assets
- implement and test antivirus solution
- employ systems to negate environmental threats
- demonstrate features of data backup, restore and system roll back
- perform network monitoring using a variety of current standard tools
- add network controls according to network and data integrity policies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the broad principles of data integrity on a network, including:
  - auditing and control of user access
  - asset tracking and auditing
  - current antivirus solutions and techniques
- describe backup, restore and rollback procedures
- identify and describe system and network monitoring tools and their related functions
- recognise and overview the client organisation structure and business functionality as they relate to data integrity
- select and describe the tools and applications required to manage network and data integrity, including the disaster recovery processes.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype where network and data integrity strategies may be implemented and managed
- use of network support tools currently used in industry
- the organisation's security policies, manufacturer recommendations and network and data integrity protection standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTNWK404 Install, operate and troubleshoot a small enterprise branch network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to utilise networking fundamentals, including wide area network (WAN) technologies, basic security, routing and switching fundamentals, and to configure simple networks.

It applies to individuals working in a network support position. They would use the appropriate tools, equipment, software and protocols to install, operate, and troubleshoot, a small enterprise branch network.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Specify the operation of a data network	1.1 Identify the various network elements 1.2 Use the open system interconnections (OSI) and transmission control protocol, or internet protocol (TCP/IP), models to explain how data flows in a network 1.3 Define the purpose, and basic operation, of the protocols in the OSI and TCP/IP models 1.4 Identify common network problems at layers 1, 2, 3 and 7, using a layered model approach
2. Implement a small switched network	2.1 Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts 2.2 Identify the network segmentation, basic traffic management and switching requirements 2.3 Perform, save and verify the initial switch configuration tasks 2.4 Verify the network status and switch the operation using basic utilities 2.5 Implement and verify the basic security for a switch
3. Implement an IP addressing scheme and IP services to meet network requirements	3.1 Specify the need and role of addressing in a network 3.2 Create and apply an addressing scheme to a network 3.3 Assign and verify valid IP addresses to hosts, servers and networking devices in a local area network (LAN) environment 3.4 Specify the operational requirements of private and public IP addressing 3.5 Implement static and dynamic addressing services for hosts in a LAN environment 3.6 Enable the network address translation (NAT) for a small network, with a single internet service provider (ISP) and connection, and verify the operation 3.7 Configure the dynamic host configuration protocol (DHCP) on a router
4. Implement a small routed network	4.1 Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts

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ELEMENT	PERFORMANCE CRITERIA
	4.2 Research and select a basic router 4.3 Perform, save and verify basic router configuration tasks 4.4 Configure and verify, a classless routing protocol 4.5 Verify the device configuration and network connectivity, using basic utilities 4.6 Implement the password, and physical security
5. Implement and verify WAN links	5.1 Research different methods for connecting to a WAN 5.2 Configure and verify, the basic WAN serial connection
6. Troubleshoot a small enterprise branch network	6.1 Identify and resolve, common switched network issues 6.2 Identify and correct, IP addressing issues 6.3 Troubleshoot DHCP and NAT on a router 6.4 Identify and resolve, common routing problems 6.5 Troubleshoot basic WAN connection problems

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 2.1, 2.2, 4.1, 4.2, 4.6, 5.1	• Interprets and critically analyses complex texts • Applies appropriate strategies to construct meaning from complex texts
Writing	3.1, 3.4, 4.4	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience • Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Oral Communication	1.1, 1.2, 1.3, 2.2, 3.1, 3.4, 4.2, 5.1	• Articulates clearly using specific and relevant language suitable to the audience, to convey information • Uses listening and questioning techniques to confirm the understanding of clients
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.2, 6.1, 6.2, 6.3, 6.4, 6.5	• Determines job priorities, resources and equipment and works logically and systematically, to undertake clearly defined and familiar tasks • Understands the purposes, specific functions, and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and responds to predictable routine problems, related to own role in the immediate work context, including debugging, switch and router network issues

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network	ICANWK404A Install, operate and troubleshoot a small enterprise branch network	Updated to meet Standards for Training Packages. Minor changes to Performance Criteria for clarity.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK404 Install, operate and troubleshoot a small enterprise branch network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- specify the network elements
- implement a small switched network
- select and implement the suitable network addressing protocols
- select and install a router
- identify and verify, wide area network (WAN) links
- test and resolve the problems for a small enterprise branch network.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the design of an internet protocol (IP) addressing scheme
- describe how to install, configure and test the network elements, in order to ensure interoperability within the network
- explain how to apply network topologies, protocols and security solutions and troubleshoot defined network problems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where the network installation may be conducted
- small enterprise routers and switches
- the network's design documentation
- the equipment specifications
- hardware and software
- the organisational guidelines
- computers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK405 Build a small wireless local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build and arrange connectivity to a single zone wireless local area network (WLAN).

It applies to individuals with competent information and communications technology (ICT) skills using one wireless access point or wireless router in a small-to-medium enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client and equipment requirements	1.1 Identify, clarify and organise client requirements according to network needs and organisational requirements 1.2 Ensure an appropriate person has given the authority for wireless network access 1.3 Evaluate requirements along with business needs, and translate into technical requirements 1.4 Identify components to be installed in order to meet the technical requirements 1.5 Select position for access point, based on user requirements and environmental conditions 1.6 Arrange for preliminary work to be carried out to meet cabling and power requirements
2. Select, install and configure wireless access point	2.1 Select access point device based on current and future client needs 2.2 Install and configure access point to provide wireless access to network 2.3 Configure services 2.4 Test access point and verify wireless connection and security arrangements 2.5 Select, install and configure appropriate wireless card where necessary for legacy equipment
3. Configure network	3.1 Configure security and other key parameters consistent with commercial and business requirements 3.2 Test security and firewall arrangements with appropriate test equipment 3.3 Test the network with user equipment for general compatibility and access
4. Train users	4.1 Determine devices to be connected to the network 4.2 Demonstrate how pairing and log-on arrangements are established to user 4.3 Inform users of wireless network etiquette and traffic capacity issues

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ELEMENT	PERFORMANCE CRITERIA
	4.4 Develop user documentation

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.5	• Recognises and interprets textual information to determine business requirements and all environmental requisites
Writing	4.4, 5.3	• Develops material for a specific audience, using clear and detailed language in order to convey explicit information, and keeps a record of relevant setting information
Oral Communication	1.1, 1.2, 4.2, 4.3	• Uses listening and questioning skills to clarify job requirements • Uses appropriate, detailed and clear language to address key personnel and to disseminate information
Navigate the world of work	1.1	• Complies with explicit organisational policies and procedures
Get the work done	1.1, 1.3-1.6, 2.1-2.5, 3.1-3.3,4.1, 5.1-5.3	• Determines job priorities, resources and equipment, and works logically and systematically to undertake clearly defined and familiar tasks • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and responds to predictable routine problems related to role in the immediate work context, including connectivity and security issues

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK405 Build a small wireless local area network	ICANWK405A Build a small wireless local area network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK405 Build a small wireless local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop, implement and maintain wireless networks
- install, configure and test wireless access points
- test security and network to business specifications
- develop user training material
- monitor and resolve wireless network issues.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline features of security threats
- summarise the basic principles of network security, including:
  - audit and intrusion detection systems
  - auditing and penetration testing techniques
  - authentication methods
  - network protocols and operating systems
  - security protocols, standards and data encryption
- describe the factors that impact on a small wireless network, including:
  - bandwidth and quality of service
  - factors affecting signal quality
  - layer 2 and layer 3 design issues
  - features of a small office or home office (SOHO) network
  - wireless security strategies
  - wireless topologies
  - wireless local area network (WLAN) solutions
- outline the protocols and their application for wireless networks, including:
  - transmission control protocol (TCP)
  - internet protocol (IP).

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- network technical requirements
- network infrastructure, including wireless hardware and software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK406 Install, configure and test network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure and test network security in an information and communications technology (ICT) network.

It applies to individuals working as ICT professionals who install, configure and test secure networks of any size.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess network security threats and vulnerabilities to identify risk	1.1 Assess and report on current system security, according to required asset security level 1.2 Determine additional network, software, hardware and system security threats and vulnerabilities 1.3 Use identified threats and vulnerability information to identify security risks 1.4 Make recommendations to management to address security deficiencies, according to current and future commercial and business requirements
2. Implement countermeasures for identified vulnerabilities and threats	2.1 Implement required level of perimeter security based on current and future business needs 2.2 Assess and implement best practice server and network hardening techniques and measures 2.3 Implement secure authentication and user account controls 2.4 Secure data integrity and transmission
3. Test and verify functionality and performance of security system implemented	3.1 Design test items to verify key function and performance measures against criteria 3.2 Conduct function and performance tests recording results 3.3 Modify and debug security system as necessary 3.4 Develop documentation on current system settings and file for future reference
4. Provide systems for monitoring and maintaining security	4.1 Monitor current network security, including physical aspects, using appropriate third party testing software where applicable 4.2 Review logs and audit reports to identify and record security incidents, intrusions or attempts 4.3 Carry out spot checks and audits to ensure that procedures are not being bypassed 4.4 Document newly discovered security threats, vulnerabilities and risks in a report for presentation to appropriate person to gain approval for changes to be made

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.2	• Recognises and interprets textual information to determine specific information about security incidents
Writing	1.1, 1.4, 3.2, 3.4, 4.4	• Accurately records test results and develops material for a specific audience, using clear and detailed language in order to convey explicit information
Oral Communication	1.1, 1.4, 4.4	• Articulates information clearly, using specific and relevant language suitable to audience to convey recommendations and provide verbal reports • Uses listening and questioning techniques to confirm understanding
Numeracy	1.4	• Extracts and evaluates the mathematical information embedded in a range of tasks and texts
Get the work done	1.1-1.4, 2.1, 2.3, 2.4, 3.1-3.3, 4.1, 4.3	• Determines job priorities, resources and equipment, and works logically and systematically to undertake clearly defined and familiar tasks • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and responds to predictable routine problems related to own role in the immediate work context, including detecting intrusion and debugging the system when required • Automatically implements standard procedures for routine decisions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK406 Install, configure and test network security	ICANWK406A Install, configure and test network security	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK406 Install, configure and test network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assess and identify security threats, vulnerabilities and risks
- determine appropriate countermeasure for threat, vulnerability or risk
- implement countermeasure per threat or risk
- install, configure and test network elements to ensure perimeter security
- test and verify function and performance of selected security measures
- monitor network for suspicious activity and take appropriate action where necessary
- document newly discovered threats, vulnerabilities and risks, including change recommendations for approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline authentication issues
- summarise the security requirements of the client business domain, including:
  - organisation structure and business functionality
  - features and capabilities of networking technologies
  - privacy issues and privacy legislation
  - security information sources
  - risk analysis
- outline common virtual private network (VPN) issues, including bandwidth and dynamic security environment
- explain how to configure routers and switches
- summarise current industry accepted hardware and software security products, including general features and capabilities
- outline the function and operation of VPN concepts, including encryption, firewalls, packet tunnelling and authentication
- outline network protocols and operating systems
- summarise organisational issues surrounding security
- outline security perimeters and their functions
- describe security protocols, standards and data encryption
- summarise security threats, including eavesdropping, data interception, data corruption and data falsification
- outline types of VPNs, including site-to-site and user-to-site internet traffic and extranets
- summarise the systems and procedures related to:
  - audit and intrusion detection systems
  - auditing and penetration testing techniques
  - cryptography
  - local area network (LAN), wireless local area network (WLAN) and wide area network (WAN)
  - screened subnets
  - transmission control protocols or internet protocols (TCPs/IPs) and applications
  - use of virus detection software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where secure network installation may be conducted
- network security documentation
- equipment specifications
- network components
- hardware and software
- firewalls (hardware and software)
- a live network
- organisational guidelines
- networked (LAN) computers
- WAN service point of presence.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK407 Install and configure client-server applications and services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure, maintain and support server-side applications as well as client applications on network workstations, in both Windows based and Linux based networks.

It applies to individuals working as network administrators and network support staff who implement the installation and configuration of client-server based software.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine client -server software requirements	1.1 Select a client-server solution that best fits the desired outcome for a given scenario 1.2 Select hardware required to implement the client-server solution for the desired outcome 1.3 Select an appropriate host operating system for the client's server software
2. Obtain and configure server application software according to industry best practice	2.1 Investigate the range of client-server products available for the desired outcome, including commercial and open source 2.2 Identify hardware requirements 2.3 Identify available operating system platforms to host the client-server software
3. Install, configure, and manage services to meet business requirements	3.1 Install client-server software to both server and client hardware according to business guidelines 3.2 Configure the client-server software according to vendor guidelines 3.3 Monitor client-server performance to ensure performance, according to business requirements 3.4 Manage the installation of upgrades and patches to the client-server software environment 3.5 Backup and maintain client-server software
4. Assess configuration effect on overall network design	4.1 Identify appropriate utilities to monitor and determine network performance 4.2 Create network performance benchmarks prior to and on completion of client-server software installation 4.3 Compare benchmarks to assess performance effect on network after installation of client-server software
5. Test and sign off	5.1 Test operation of the client-server software to ensure client requirements are met 5.2 Obtain sign-off from appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1, 3.2	• Recognises and interprets technical and vendor-specific information to determine business requirements
Writing	4.2	• Develops material for a specific audience, using clear and detailed language in order to convey explicit information
Numeracy	4.2, 4.3	• Interprets numerical information to analyse memory, hard disk and performance requirements
Navigate the world of work	3.1, 3.2	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Interact with others	5.2	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.5, 4.1, 5.1	• Uses logical planning processes and an increasingly intuitive understanding of context to identify relevant information to plan business operating system requirements • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals, and begins to recognise strategic and operational applications • Uses familiar digital systems and tools to access, organise, analyse and display relevant information • Troubleshoots configuration and operational requirements by recognising and anticipating an increasing range of familiar problems, their symptoms and causes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK407 Install and configure client-server applications and services	ICANWK407A Install and configure client-server applications and services	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK407 Install and configure client-server applications and services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install and configure server based client-server software
- install and configure client software to communicate with appropriate server software
- test operation of client-server software
- identify and implement required updates for client-server software
- monitor performance of client-server software
- backup and maintain client-server software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the requirements for client-server applications and services, including:
  - computer hardware and software required
  - internet protocol (IP) addressing
  - networking fundamentals
  - operating systems
- identify and describe the operating system help and support utilities required, including:
  - procedures for implementing backup and recovery
  - software installation and configuration
  - user account and password management
  - troubleshooting tools and techniques
  - network diagnostic utilities.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a client-server based network
- appropriate client-server software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK408 Configure a desktop environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure and support a desktop or workstation operating system in a networked environment.

It applies to individuals with competent technical skills employed in information and communications technology (ICT) support roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to install a desktop operating system	1.1 Prepare for work according to site specific safety requirements and enterprise work health and safety (WHS) processes and procedures 1.2 Obtain desktop applications and features from appropriate person 1.3 Review required installation options and file systems 1.4 Determine and apply knowledge of licensing, hardware and system requirements 1.5 Analyse data migration requirements 1.6 Backup local data in preparation for installation 1.7 Arrange access to site and advise client of deployment and potential down times
2. Install desktop operating system	2.1 Install or upgrade desktop operating system using appropriate installation or update method 2.2 Install desktop applications according to identified requirements 2.3 Configure network settings to connect workstation to network 2.4 Patch the operating system and applications to ensure maximum security and reliability 2.5 Restore local data to new workstation
3. Configure desktop environment	3.1 Configure hardware devices 3.2 Administer user environment 3.3 Create file and directory structure using appropriate administration and system tools 3.4 Configure access to external data 3.5 Configure desktop applications according to business requirements
4. Operate command line interface	4.1 Open a command line interface 4.2 Run commands and scripts from the command line interface 4.3 Manipulate files using the command line

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ELEMENT	PERFORMANCE CRITERIA
5. Configure desktop security	5.1 Modify default user settings to ensure that they match organisational security policies 5.2 Modify file and directory ownership and permissions to ensure data security requirements are met 5.3 Ensure password security 5.4 Check appropriate legal notices are displayed at logon 5.5 Implement security options for network protocols 5.6 Configure security settings for desktop applications according to business requirements
6. Monitor and test the desktop	6.1 Test desktop environment to ensure that client, functionality and performance requirements have been met 6.2 Analyse and respond to diagnostic information 6.3 Use troubleshooting tools and techniques to diagnose and correct desktop problems 6.4 Document the desktop environment, according to organisational policy

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 3.5, 5.1, 5.4, 5.6, 6.4	• Recognises and interprets technical material, organisational policy and regulatory information to determine job requirements
Writing	6.4	• Prepares written reports and workplace documentation that communicate information clearly and effectively
Oral Communication	1.2, 1.7	• Articulates clearly using specific and relevant language suitable to audience to convey important information • Uses listening and questioning techniques to confirm understanding
Numeracy	1.5, 6.2	• Analyses numerical test measurements to evaluate workstation performance
Navigate the world of work	1.1	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1, 1.3-1.6, 2.1- 2.5, 3.1-3.5, 4.1-4.3, 5.1-5.3, 5.5, 5.6, 6.1-6.3	• Uses logical planning processes and an increasingly intuitive understanding of context to identify relevant information to plan business operating system requirements • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals, and begins to recognise strategic and operational applications • Uses familiar digital systems and tools to access organise, analyse and display relevant information • Recognises and takes responsibility for addressing predictable and some less predictable problems in familiar work contexts

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK408 Configure a desktop environment	ICANWK408A Configure a desktop environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK408 Configure a desktop environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install and configure a desktop operating system
- attach the desktop to the network
- configure the desktop operating system, including user accounts, file and print services, and security
- perform backup and recovery
- update operating system and software
- monitor and troubleshoot the desktop environment.

Candidates should demonstrate competency in at least TWO different desktop operating systems.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the features of current desktop operating systems, applications, compatibility issues and the resolution procedures
- summarise the configuration requirements of a desktop environment, including:
  - command line interface and scripts
  - controlling the boot process
  - error logging and reporting
  - file naming conventions related to selected operating system
  - network protocols and transmission control protocol or internet protocol (TCP/IP) network connectivity
  - operating systems and their functions, including file system, memory management and process scheduling
  - printer driver and queue management
  - process or task management, including process termination
  - tools available for remote assistance and administration
  - troubleshooting tools and techniques, including network diagnostic utilities
  - user account, group and password administration and guidelines for selecting a secure password
- explain file system navigation and manipulation utilities, including:
  - edit, copy, move and search
  - operating system help and support utilities
- summarise relevant work health and safety (WHS) and regulatory requirements for desktop operators.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where server installation may be conducted
- relevant server specifications, including:
  - cabling
  - local area network (LAN)
  - diagnostic software
  - switch
  - client requirements
  - wide area network (WAN) service point of presence
  - desktop workstations
- relevant regulatory documentation that affects installation activities.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK409 Create scripts for networking

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake scripted programming tasks for networking related activities.

It applies to individuals with competent technical skills employed in network or systems administration roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop algorithms to represent solutions to a given problem	1.1 Consult with client and key stakeholders to identify the problem and associated script requirements 1.2 Employ abbreviated software development cycle to script creation 1.3 Develop an algorithm to solve the problem and meet client requirements 1.4 Develop an algorithm which takes account of expected possible situations 1.5 Develop an algorithm which is guaranteed to end 1.6 Use structure, sequence, selection and iteration
2. Create code	2.1 Select appropriate scripting language 2.2 Demonstrate understanding and application of basic language syntax rules and best practices 2.3 Select and use language data types, operators and expressions to create clear and concise code 2.4 Use techniques of selection, iteration and sequence to control script execution flow 2.5 Use techniques for sequential file input and output to retrieve and store information 2.6 Obtain and use user input to affect the operation of the script 2.7 Apply internal document principles to created code 2.8 Follow organisational guidelines for developing maintainable code when creating scripts 2.9 Adhere to coding standards when creating scripts
3. Use operating system tools	3.1 Use searching and sorting tools to select information from the logging output of operating system (OS) 3.2 Implement controls to ensure that where significant events occur, script creates and maintains a log of operations via operating system logging mechanism 3.3 Register and run scripts with OS scheduling facility
4. Test and debug code	4.1 Engineer, document and conduct simple tests to confirm

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ELEMENT	PERFORMANCE CRITERIA
	code meets design specification 4.2 Identify areas that are not covered or are covered incorrectly in the script 4.3 Take action to ensure that code complies with security policy 4.4 Take action to ensure that code operates with proper permissions 4.5 Use script debugging techniques suitable for use with scripting language to detect and resolve errors of syntactical, logical and design origin
5. Document script	5.1 Create technical-level documentation 5.2 Create user-level documentation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.8, 2.9, 4.3	• Recognises and interprets technical material, organisational policy and regulatory information to determine job requirements
Writing	2.7, 3.2, 4.1, 5.1, 5.2	• Prepares user, peer and technical documentation that communicates complex information clearly and effectively
Oral Communication	1.1, 2.6	• Uses listening and questioning skills to confirm understanding for requirements, participates in a verbal exchange of ideas/solutions and uses appropriate, detailed and clear language to address key personnel and to disseminate information
Navigate the world of work	2.8, 2.9, 4.3	• Recognises and follows explicit protocols and meets expectations associated with own role
Numeracy	1.3-1.5, 2.3	• Creates complex algorithms to calculate and process data for code creation
Get the work done	1.2, 2.1-2.5, 2.8, 3.1-3.3, 4.1, 4.2, 4.4, 4.5	• Uses logical planning processes and an increasingly intuitive understanding of context to identify relevant information to plan business requirements • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals and begins to recognise strategic and operational applications • Understands the key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology • Seeks advice and feedback from client when making decisions • Applies formal problem solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts and identifying and evaluating options

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK409 Create scripts for networking	ICANWK409A Create scripts for networking	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK409 Create scripts for networking

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop an algorithmic statement of a solution for a set process
- design, document, construct and test a small single purpose operating system (OS) utility application in response to a problem description
- create scripted programs that access information stored in files on the system and use system utility programs to sort or find information within these files
- validate and record script results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the principles of algorithm design
- identify and describe operating system components and processes, including:
  - command line interface
  - log files
  - program scheduling utilities
  - development methodologies
  - tools and utilities
  - testing methods
- explain debugging for a variety of scripting scenarios
- outline programming structured control constructs: sequence, selection and iteration
- summarise scripting techniques and language syntax.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- technical requirements
- software development environment
- software testing environment.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK410 Install hardware to a network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, manage and install new hardware components in a network.

It applies to individuals employed in technical information and communications technology (ICT) support roles, such as network administrators, who support network hardware in a peer-to-peer or client-server networked environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine network hardware requirements	1.1 Assess client network hardware and cabling requirements, considering compatibility with existing application software and operating system 1.2 Analyse requirements against local area network (LAN), wide area network (WAN), wireless networks, and mobile equipment access design limitations and organisational guidelines 1.3 Evaluate client requirements according to organisational guidelines, corporate purchasing procedures, licensing arrangements and budget
2. Obtain network hardware	2.1 Contact vendors and obtain technical specifications 2.2 Evaluate or test hardware according to client requirements and organisational guidelines 2.3 Document recommendations and provide copies to appropriate person 2.4 Determine and document licensing requirements and security issues 2.5 Acquire hardware according to recommendations and organisational procedures 2.6 Organise cabling infrastructure where required
3. Install network hardware	3.1 Conduct installation with minimal disruption to clients 3.2 Install hardware according to appropriate installation procedures 3.3 Configure and test the installation to ensure that it meets client needs
4. Provide instruction and support for installed products	4.1 Determine and document client instructions and needs 4.2 Provide one-to-one or group instruction to client and users as required 4.3 Obtain client evaluation and feedback to ensure that client requirements have been met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.2, 2.5	• Recognises and interprets licensing and security issues, technical information and organisational procedures to determine job requirements
Writing	2.4, 4.1	• Prepares information which incorporates evaluation of information and specialised and cohesive language in a format and style appropriate to a specific audience
Oral Communication	2.1, 2.3, 4.1-4.3	• Uses listening and questioning skills to confirm understanding for requirements • Participates in regular verbal exchanges and uses appropriate, detailed and clear language to address key personnel and to disseminate information
Numeracy	1.3	• Uses mathematical formulas and calculations to estimate and plan costs according to business budgets
Navigate the world of work	1.2, 1.3, 2.4, 2.5	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1-1.3, 2.2, 2.5, 2.6, 3.1- 3.3	• Determines job priorities, resources and equipment, and works logically and systematically to maintain the continuity of network operations and business functions during network installation tasks • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Recognises and responds to predictable routine problems related to own role in the immediate work context • Automatically implements standard procedures for routine decisions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK410 Install hardware to a network	ICANWK410A Install hardware to a network	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK410 Install hardware to a network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate client user requirements and hardware installation
- install a range of network hardware by planning, managing and supporting the installation of new components in a network, according to organisational policies and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise current industry, data and voice networking, security products, devices and procedures, including:
  - current industry accepted network protocols
  - organisational contracting procedures and responsibilities
  - system diagnostic software
- outline current industry accepted network hardware and software products
- explain hardware and software installation procedures
- describe local area network (LAN) capabilities and characteristics, such as network type, internet protocol (IP) addressing, switch or hub operation
- describe various features of network connections, including types of cables, cabling distance limitations and wireless connections
- outline operating systems sufficient to enable basic installation
- summarise set-up and configuration procedures
- describe software packages supported by the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- vendor hardware and software components
- application software and operating system
- hardware maintenance tools
- a live network
- networked computers
- organisational guidelines
- technical documentation and installation manuals.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK411 Deploy software to networked computers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, manage and support the installation of new or upgraded software to networked computers according to vendor and organisation specifications.

It applies to individuals involved in installing, configuring, maintaining and supporting software, such as network administrators and network support staff.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine operating system and software and hardware requirements	1.1 Assess client software and licensing requirements, considering compatibility with existing application software and operating system 1.2 Assess hardware requirements 1.3 Analyse requirements against local area network (LAN), wide area network (WAN), and wireless networks within organisational guidelines 1.4 Evaluate client requirements according to organisational guidelines, corporate purchasing procedures and budget
2. Obtain deployment software to automate deployment	2.1 Evaluate deployment software according to client requirements and organisational guidelines 2.2 Contact vendors and obtain technical specifications, including support arrangements and licensing 2.3 Acquire software and licences according to organisational procedures 2.4 Store software licences and manuals according to organisational guidelines
3. Automate installation of operating system via network	3.1 Plan and deploy operating system according to appropriate vendor installation procedures, with minimal disruption to network and clients 3.2 Configure and test installation to ensure that it meets client needs and vendor specifications 3.3 Install updates and patches
4. Automate installation of software packages via network	4.1 Plan and deploy software packages according to appropriate vendor installation procedures, with minimal disruption to network and clients 4.2 Configure and test installation to ensure that it meets client needs and vendor specifications 4.3 Install updates and patches
5. Test and sign off	5.1 Test installed operating system and software for error-free performance, identifying and resolving problems 5.2 Determine and document security and licensing issues

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Obtain client evaluation and feedback to ensure that client requirements have been met

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.4, 2.1, 2.3, 2.4, 3.1, 3.2, 4.1, 4.2	• Recognises and interprets technical, licensing and organisational information to determine business requirements
Writing	1.3, 5.2	• Develops material for a specific audience, using clear and detailed language in order to convey explicit information
Oral Communication	2.2, 5.3	• Uses active listening, observational and questioning techniques in order to identify information and confirm, clarify or revise understanding • Uses specific and relevant language to obtain information to determine job requirements
Numeracy	1.4	• Uses mathematical formulas and calculations to estimate and plan costs according to business budgets
Navigate the world of work	1.1, 1.3, 1.4, 2.1-2.4, 5.2	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1-1.4, 2.1, 2.3, 2.4, 3.1-3.3, 4.1-4.3, 5.1	• Determines job priorities, resources and equipment, and works logically and systematically • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Uses analytical processes to respond to deployment and configuration issues in the immediate work context • Automatically implements standard procedures for routine decisions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK411 Deploy software to networked computers	ICANWK411A Deploy software to networked computers	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK411 Deploy software to networked computers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify client software requirements
- plan and deploy automatic installation of operating system and software
- configure and test installation, ensuring client needs are met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise network protocols and operating systems, including:
  - transmission control protocols (TCP)
  - internet protocols (IPs)
  - network applications
- describe organisational contracting procedures and responsibilities
- outline software licensing requirements and documentation
- explain current industry standards related to software deployment, including:
  - deployment software configuration
  - configuration of automated deployment processes
  - operating system deployment
  - software package deployment
  - troubleshooting deployment processes.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype where deployment processes may be implemented
- a live network
- software tools to support implementation of deployment processes
- technical documentation and installation manuals
- organisational guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK412 Create network documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine network requirements, and produce and evaluate appropriate network documentation.

It applies to individuals with good task management and competent information and communications technology (ICT) skills, who are working as network administrators, technicians and support personnel.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine network documentation requirements	1.1 Consult with appropriate personnel 1.2 Identify network documentation standards 1.3 Define network configuration 1.4 Develop naming standards and labelling schemes 1.5 Develop network addressing scheme and verify, using calculations
2. Design network diagrams and checklists	2.1 Identify network software mapping tools 2.2 Use network software mapping tools to design network diagrams 2.3 Develop plans and checklists 2.4 Develop manuals
3. Produce network documentation	3.1 Validate documentation structure with appropriate personnel 3.2 Produce network diagrams 3.3 Produce network plans and checklists 3.4 Produce procedure and policy manuals 3.5 Prepare documentation for publication
4. Complete network documentation	4.1 Check network documentation with appropriate personnel 4.2 Select appropriate media 4.3 Publish network documentation 4.4 Record and store essential network documentation 4.5 Notify appropriate personnel of the completed network documentation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2	• Gathers, interprets and analyses current industry information from a range of sources and identifies relevant and key information
Writing	1.4, 2.3, 2.4, 3.2-3.5, 4.4, 4.5	• Prepares workplace documentation which incorporates an evaluation of information and specialised and cohesive language in a format and style appropriate to a specific audience
Oral Communication	1.1, 3.1, 4.1, 4.5	• Articulates requirements and strategies clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	1.5	• Recognises, compares and interprets technical data when developing network addressing scheme
Get the work done	1.2, 1.3, 1.5, 2.1, 2.2, 4.2- 4.4	• Takes responsibility for planning and organising own workload, identifying ways of sequencing, prioritising and monitoring own work • Uses familiar digital systems and tools to access, organise, analyse and display information relevant to role • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Makes a range of important decisions in relatively complex situations, taking a range of constraints into account

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK412 Create network documentation	ICANWK412A Create network documentation	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK412 Create network documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine client requirements
- design network documentation according to standards
- produce network documentation according to design specifications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain open systems interconnect (OSI) layered communication model
- summarise network requirements related to:
  - applications
  - life cycles
  - manageability
  - quality of service
- explain network design concepts related to:
  - financial constraints
  - network topologies
  - organisation requirements
  - physical constraints
  - security issues.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- relevant network documentation
- legislation and standards documentation
- industry codes of practice.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK414 Create a common gateway interface script

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to define and produce common gateway interface (CGI) script and install that script on a server.

It applies to individuals working in the network or web development area who are required to use CGI scripting as a common means of interacting with websites, providing security access to directories and databases.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define specification for CGI script	1.1 Determine the functionality of the CGI form 1.2 Define the functionality of the CGI script 1.3 Choose appropriate language in which to write the CGI script 1.4 Determine server requirements
2. Create CGI form and write script	2.1 Produce a hypertext markup language (HTML) web document that uses the form elements required by the CGI script specification and includes the uniform resource locator (URL) for the CGI script 2.2 Write the CGI script to function as required by the CGI script specification
3. Test CGI script	3.1 Configure the server, if required, that will host the CGI script 3.2 Upload the CGI script to the server 3.3 Run the CGI form and assess its output 3.4 Reiterate until the specification for the CGI script is met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.2, 2.1, 2.2	• Prepares workplace documentation that incorporates an evaluation of technical information and specialised and cohesive language in a format and style appropriate to a specific audience
Numeracy	2.1, 3.3, 3.4	• Analyses numerical data to determine functionality of script
Get the work done	1.1, 1.3, 1.4, 2.1, 3.1-3.4	• Takes responsibility for planning and organising own workload, identifying ways of sequencing, prioritising and monitoring own work • Uses familiar digital systems and tools to access, organise, analyse and display information relevant to role • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Makes a range of important decisions in relatively complex situations, taking a range of constraints into account • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK414 Create a common gateway interface script	ICANWK414A Create a common gateway interface script	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK414 Create a common gateway interface script

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review the requirements
- produce common gateway interface (CGI) forms and scripts to meet the requirements
- upload scripts to a server
- test the script and rework until requirements are met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe a scripting language suitable for CGI
- describe CGI 1.1/1.2 specifications and their functionality
- describe the security issues surrounding CGI
- outline common web servers
- outline the principles behind copyleft and Free Software Foundation
- describe copyright and intellectual property issues relating to programming.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- web servers
- an e-business website
- file transfer protocol (FTP) or file transfer client software
- server access.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK416 Build security into virtual private networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build security into a virtual private network (VPN).

It applies to individuals with competent information and communications technology (ICT) skills and who are working in the network area and are required to ensure that VPNs contain required security.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Configure router to provide for network security monitoring and management	1.1 Create and apply audit rules consistent with policies, standards, protocols and management systems 1.2 Configure router to provide appropriate level of asset security and monitoring of security consistent with commercial and business requirements 1.3 Monitor and manage system to assess the level of security and attempts to breach security of framework components 1.4 Employ appropriate hardware and software to monitor and address security issues and provide VPN solutions
2. Secure a site-to-site VPN	2.1 Configure internet key exchange (IKE) and internet protocol security (IPSec) 2.2 Configure site-to-site IPSec VPN using pre-shared keys 2.3 Configure site-to-site IPSec VPN using digital certificates
3. Secure a remote access VPN	3.1 Configure a VPN server 3.2 Install and administer a router management console 3.3 Develop documentation on current system settings and framework components, and file securely for future reference

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Gathers, interprets and analyses current industry rules from a range of sources and identifies relevant and key information
Writing	1.1, 3.3	• Prepares workplace documentation that incorporates an evaluation of information and specialised and cohesive language in a format and style appropriate to a specific audience
Navigate the world of work	1.1	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Get the work done	1.2-1.4, 2.1-2.3, 3.1-3.3	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks • Understands the importance of secure information in relation to own work and takes personal responsibility for identifying and managing risk • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when responding to familiar problems within the immediate context

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK416 Build security into virtual private networks	ICANWK416A Build security into virtual private networks	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK416 Build security into virtual private networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- configure a router to provide the required security
- implement and maintain security functionality for a virtual private network (VPN), including:
  - site to site VPN
  - remote access VPN
- produce security documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the characteristics of a VPN system, including:
  - site to site
  - remote access systems
  - network protocols and operating systems relevant to VPN, including its features, issues and functions
- describe the security requirements for a VPN, including:
  - auditing and penetration testing techniques
  - configuration of routers and switches
  - security protocols, standards and data encryption
  - processes and techniques related to security perimeters and their functions
  - security threats, including eavesdropping, data interception, data corruption and data falsification
  - transmission control protocol or internet protocol (TCP/IP) protocols and applications audit and intrusion detection systems
  - authentication issues
- recognise and describe the differences between common networks, including:
  - local area network (LAN)
  - wireless local area network (WLAN)
  - wide area networks (WAN)
- identify and describe organisational issues surrounding:
  - security cryptography
  - screened subnets
  - virus detection software.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- network technical requirements
- network infrastructure, including servers and security hardware and software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK417 Build an enterprise wireless network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build an enterprise, community or mesh wireless network within and outside buildings.

It applies to individuals with excellent task management, interpersonal and information and communications technology (ICT) skills working in senior design roles in the networking area, who are required to develop complex wireless networks for organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements and network equipment required	1.1 Identify and clarify organisational requirements of the client 1.2 Evaluate client requirements along with business needs in order to translate into technical requirements 1.3 Review existing network design documentation to ensure it is authorised, current and complete 1.4 Identify network topology 1.5 Identify the components required to be installed to meet the technical requirements 1.6 Contact vendors and service suppliers to obtain specifications and availability of identified components 1.7 Ensure preliminary work is completed within the required timeframe
2. Prepare for installation	2.1 Ensure client and users are aware of date and time of installation 2.2 Gather, prepare and check installation and safety equipment 2.3 Assess on-site safety arrangements for installers and users
3. Select, install and configure access points and other wireless devices	3.1 Select appropriate hardware based on identified components 3.2 Install and configure hardware to provide wireless access to network 3.3 Ensure connections are secured against intrusion or data access by unauthorised persons, are safe for users, and are protected from the environment 3.4 Configure security, monitoring, logging and quality of service features consistent with standards and protocols 3.5 Ensure test equipment is calibrated 3.6 Test wireless network systems performance and verify that it meets enterprise requirements and is consistent with standards and protocols
4. Select, install and configure antennas	4.1 Select appropriate antennas based on design plan 4.2 Safely install and configure antennas to provide wireless access to network 4.3 Measure and assess signal strength within and outside

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ELEMENT	PERFORMANCE CRITERIA
	building 4.4 Resolve and report radio frequency interference issues
5. Select, install and configure antennas	5.1 Identify possible security threats to assets 5.2 Configure client server and helper security devices 5.3 Configure associations and filters
6. Train users	6.1 Provide training for users to establish and manage network connections 6.2 Resolve pairing and log-on difficulties for users 6.3 Inform users of wireless network etiquette and traffic capacity issues 6.4 Advise users of help desk contact details
7. Monitor and administer wireless network	7.1 Monitor wireless network performance using diagnostic tools, including appropriate software 7.2 Debug networking issues to maintain trouble-free wireless connection 7.3 Document current settings and store securely, consistent with commercial and business requirements
8. Finalise build process	8.1 Review network for performance issues, planned maintenance or upgrade requirements 8.2 Report to client with network documentation and recommendations for performance issues 8.3 File documentation according to organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 1.5, 3.4, 3.6, 4.1, 8.3	• Gathers, interprets and analyses information from a range of sources and identifies relevant and key information
Writing	4.4, 7.3	• Prepares workplace documentation that incorporates an evaluation of information and specialised language in a format and style appropriate to a specific audience
Oral Communication	1.1, 1.2, 1.6, 2.1, 4.4, 6.1, 6.3, 6.4, 8.2	• Uses active listening and observational and questioning techniques to identify information and confirm, clarify or revise understanding • Articulates requirements and strategies clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	3.5, 4.3	• Interprets numerical information to calibrate equipment and measure and assess signal strength
Navigate the world of work	8.3	• Complies with explicit organisational policies and procedures
Interact with others	6.1, 6.3, 6.4, 8.2	• Recognises and applies the protocols governing what to communicate, with whom and how in a range of different contexts
Get the work done	1.4, 1.5, 1.7, 2.2, 2.3, 3.1-3.6, 4.1, 4.2, 4.4, 5.1-5.3, 6.2, 7.1-7.3, 8.1, 8.3	• Uses a combination of formal, logical planning processes to ensure work is completed according to time constraints and an increasingly intuitive understanding of context to identify relevant information and risks • Understands the importance of secure information in relation to own work and takes personal responsibility for identifying and managing risk • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when solving a broad range of ICT problems

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		• Uses familiar digital systems and tools to access, organise, analyse and store information

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK417 Build an enterprise wireless network	ICANWK417A Build an enterprise wireless network	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK417 Build an enterprise wireless network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- confirm client organisational and business requirements
- determine hardware and software requirements
- prepare for safe installation
- select, install and configure required wireless hardware
- train users
- test, monitor, and administer the installation
- finalise installation and prepare required documents documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- Identify and describe current wireless local area network (WLAN) and wireless area network (WAN) solutions, including:
  - audit and intrusion detection systems
  - auditing and penetration testing techniques
  - bandwidth and quality of service
  - factors affecting signal quality
  - layer 2 and layer 3 design issues
  - suitability for small office home office (SOHO) and enterprise local area networks (LANs)
  - transmission control protocols or internet protocols (TCPs/IPs) and applications
  - wireless topologies
- describe the common features of security threats and how to develop a security strategy, including:
  - security protocols
  - standards
  - data encryption
- identify and describe common network protocols and operating systems.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- technical requirements
- network infrastructure, including wireless hardware and software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK418 Implement backbone technologies in a local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement core layer (backbone) connectivity in a local area network (LAN) for applications between floors in a multi-storey building or between separate buildings.

This unit focuses on configuring high-speed (high-bandwidth) channels between high-end switches.

It applies to individuals who are required to enable backbone connectivity in a LAN.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define network	1.1 Identify current and future network requirements based on the organisation's business and technical requirements 1.2 Design an appropriate structure to meet client requirements, such as video, audio or data application services 1.3 Design a network addressing system with subnet and host identities (IP addressing) and virtual LANs (VLANs) 1.4 Identify and document resource requirements according to network design
2. Install and configure network backbone	2.1 Install and configure switches and routers according to network requirements and resources 2.2 Install network protocol suites using configurations on switch uplink ports as required by network design specifications 2.3 Configure hosts and workstations for network access
3. Test and validate network	3.1 Test network connectivity to ensure operation parameters are met between hosts on segments or VLANs 3.2 Make adjustments as required 3.3 Validate and document network performance

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2	• Gathers, interprets and analyses current network design specifications and identifies relevant and key information
Writing	1.4, 3.3	• Prepares technical documentation that incorporates an evaluation of information and specialised and cohesive language in a format and style appropriate to a specific audience
Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.3	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to prioritise tasks and contingency arrangements • Uses mobile communication tools and specialised software to ensure that geographically distributed team members remain connected in virtual environments • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when responding to familiar problems within the immediate context
Reading	2.2	• Gathers, interprets and analyses current network design specifications and identifies relevant and key information
Writing	1.4, 3.3	• Prepares technical documentation that incorporates an evaluation of information and specialised and cohesive language in a format and style appropriate to a specific audience
Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.3	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to prioritise tasks and contingency arrangements • Uses mobile communication tools and specialised software to ensure that geographically distributed team members remain connected in virtual environments • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when responding to familiar problems within the immediate context

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK418 Implement backbone technologies in a local area network	ICANWK418A Implement backbone technologies in a local area network	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK418 Implement backbone technologies in a local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define, design and document the structure of the network and subnets required for the network
- build and test an asynchronous transfer mode (ATM) local area network (LAN) that provides the required services at the required communication standards
- document resource requirements and network performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline current and emerging industry practice associated with:
  - bandwidth limitations, measuring and testing
  - LAN and wide area network (WAN) network topologies (three-layer LAN hierarchy: core distribution and access)
  - MAC addresses, network layer protocols
  - open systems interconnect (OSI) layer modelling
  - routers
  - virtual LANs
- identify and describe network interface cards (NICs) and switches, including:
  - fast Ethernet
  - gigabit
  - 10-gigabit Ethernet
  - store-and-forward
  - fast-forward
  - fragment-free
- identify and describe internetworking protocol suites, including:
  - TCP/IP
  - IPX
  - DECnet
  - AppleTalk
  - IPv6.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- local area network infrastructure
- switches with various interfaces.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK419 Identify and use current virtualisation technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use virtualisation technology, according to the industry standards for reviewing and demonstrating work processes, skills and techniques to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of virtualisation technology.

This unit applies to individuals engaged in ongoing review and research who review, and maintain, business processes at the highest level possible.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to use virtualisation technologies	1.1 Identify the enterprise requirements, and determine the need for desktop virtualisation software 1.2 Identify the virtualisation vendors and the different types of virtualisation technology that they offer 1.3 Identify, review and select the desktop virtualisation software, where appropriate 1.4 Select suitable desktop virtualisation software
2. Use desktop virtualisation software to assist in solving organisational problems	2.1 Test the desktop virtualisation software 2.2 Use the features and functions of desktop virtualisation software in an organisational context, in line with environmental factors 2.3 Demonstrate an in-depth of knowledge of desktop virtualisation technologies, to an accepted industry standard 2.4 Access and use, the sources of information relating to desktop virtualisation technology
3. Evaluate the desktop virtualisation software performance	3.1 Review the effect of desktop virtualisation software on benefits to the enterprise 3.2 Seek feedback from users, where appropriate, and update the desktop

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.4, 3.1	• Critically analyses documentation from a variety of sources and records, and consolidates information, to determine requirements
Writing	3.2	• Writes, edits and proofreads documents to ensure clarity of meaning, and the accuracy and consistency of information
Oral Communication	3.2	• Uses specific and relevant language to clearly describe and explain, a range of technical, operational and business-related matters, with internal and external personnel
Navigate the world of work	1.1, 2.2	• Identifies, and acts on, issues that contravene relevant policies, procedures and legal requirements • Takes personal responsibility for following explicit and implicit policies, procedures and legislative requirements
Interact with others	3.2	• Selects and uses, the appropriate conventions and protocols when communicating with clients and co-workers, in a range of work contexts
Get the work done	1.1-1.4, 2.1, 2.2, 2.3, 3.1	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes, for more complex and non-routine situations • Contributes to the continuous improvement of current work practices, by applying basic principles of analytical and lateral thinking

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK419 Identify and use current virtualisation technologies	ICANWK419A Identify and use current virtualisation technologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK419 Identify and use current virtualisation technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify current new, and emerging, virtualisation technology
- identify and use, the features and functions of industry-specific virtualisation technologies
- review and evaluate the virtualisation software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe current technology trends, and directions, in information and communications technology (ICT), specifically in the major industry technology standards used in virtualisation technology
- recognise the vendor product directions relating to virtualisation technology
- outline current industry hardware and software products, and their general features, capabilities and application
- recognise information-gathering techniques
- describe the environmental and sustainability policies of the workplace
- identify the features of virtualisation technology
- recognise how to test, and evaluate, virtualisation technology
- locate the appropriate sources of information regarding virtualisation technology.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where industry-specific technologies may be used
- industry-specific technologies currently used in the industry
- documents detailing work health and safety (WHS) standards, environmental guidelines, and enterprise requirements
- the virtualisation software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK501 Plan, implement and test enterprise communication solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage deployment and administration of an enterprise messaging environment.

It applies to individuals working as information and communications technology (ICT) professionals who configure and deploy software to supply mail, collaboration and messaging services in an enterprise environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan, implement and test an enterprise email solution	1.1 Plan implementation to provide mail services to meet business requirements 1.2 Prepare existing network for mail server installation 1.3 Install and configure mail servers 1.4 Configure users, mailboxes, address lists, distribution lists and user constraints 1.5 Configure mail-client access 1.6 Configure message integrity and anti-spam, antivirus and anti-phishing measures 1.7 Configure message transport to deliver mail within and outside enterprise 1.8 Monitor mail system performance 1.9 Implement measures to provide high availability and data recovery 1.10 Test functionality
2. Plan, implement and test remote access to email	2.1 Plan remote access to mail 2.2 Configure mail system to provide remote access 2.3 Test remote mail access
3. Plan, implement and test an enterprise web portal or content management solution	3.1 Plan namespace and server roles, and deploy web portal or content management software 3.2 Configure access and security 3.3 Configure network infrastructure 3.4 Manage design and customisation of portal and related services 3.5 Monitor performance and logs 3.6 Implement measures to provide high availability and disaster recovery 3.7 Test functionality
4. Plan, implement and test business collaboration tools	4.1 Plan namespace and server roles, and deploy business collaboration software

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ELEMENT	PERFORMANCE CRITERIA
	4.2 Configure access and security 4.3 Configure network infrastructure 4.4 Customise to meet business requirements 4.5 Monitor performance and logs 4.6 Implement measures to provide high availability and disaster recovery 4.7 Test functionality

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.5	• Gathers, interprets and analyses technical documentation to test and implement business tools successfully
Numeracy	1.10, 3.5	• Selects and interprets mathematical information that may be partly embedded in a range of familiar and less familiar tasks to evaluate performance and interoperability of communication services
Get the work done	1.1-1.10, 2.1-2.3, 3.-3.4, 3.6, 3.7, 4.1-4.4, 4.6, 4.7	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, design and implement a communications solution • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals and begins to recognise strategic and operational applications • Uses specialised software to ensure a business can engage with geographically distributed team members in virtual environments • Initiates standard procedures when responding to a predictable range of network and software compatibility problems

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK501 Plan, implement and test enterprise communication solutions	ICANWK501A Plan, implement and test enterprise communication solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK501 Plan, implement and test enterprise communication solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and implement an enterprise mail system
- plan and implement an enterprise web portal or content management system
- design and implement business collaboration tools
- configure network, servers and application software to provide optimal performance, meet security requirements and avoid known conflicts
- configure applications to meet customisation requirements
- monitor and test the performance of aspects of the solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe the features of a mail server application
- describe business collaboration tools
- explain the purpose and use of web portal or content management software
- outline the importance of administering database servers to support portal applications
- describe the key principles of data protection, including:
  - backup and restoration
  - firewall configuration
  - security and authentication practices
- describe the important features of administering a network, including:
  - load balancing for applications
  - server or directory administration
  - infrastructure
  - web server administration.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- site where server applications can be installed
- networked servers
- workstations
- switch
- wide area network (WAN) service point of presence.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK502 Implement secure encryption technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure secure file encryption is selected, implemented and monitored on a computer network or local environment.

It applies to individuals working as information and communications technology (ICT) professionals who may select, implement and monitor a secure encryption environment in any size enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine encryption methods	1.1 Analyse enterprise data security requirements 1.2 Create a new or review an existing security plan to determine appropriate encryption methods 1.3 Review a range of encryption technologies and rank the most appropriate options 1.4 Assess the costs associated with each encryption option 1.5 Document encryption options and costs, and forward to appropriate person for decision
2. Implement encryption	2.1 Apply encryption technologies to the enterprise system 2.2 Analyse effect of encryption technologies on user roles and responsibilities 2.3 Inform user of new encryption technologies and the effect it has on their responsibilities
3. Monitor encryption	3.1 Analyse implementation of the encryption technologies, confirming function and performance 3.2 Review help desk records for problems concerning implementation and take appropriate action 3.3 Review system logs for encryption issues and compromises 3.4 Document encryption issues and compromises, and notify appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.2	• Gathers, interprets and analyses technical data to determine security requirements and help desk records to interpret technical compromises
Writing	1.1, 1.3, 1.5, 3.4	• Prepares workplace documentation that incorporates an evaluation of technical information and specialised and cohesive language in a format and style appropriate to a specific audience
Oral Communication	2.3, 3.4	• Articulates requirements and responsibilities clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	1.4	• Uses mathematical formulas and calculations to undertake a cost-benefit analysis
Navigate the world of work	1.1	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Interact with others	1.5	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.3, 2.1, 2.2, 3.1-3.3	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to determine data security threats, risks and countermeasures • Manages and maintains data securely and actively monitors technology, notifying others if security becomes compromised • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks • Initiates standard procedures when responding to familiar problems to troubleshoot, debug and correct connectivity and security issues

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK502 Implement secure encryption technologies	ICANWK502A Implement secure encryption technologies	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK502 Implement secure encryption technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse enterprise data security requirements
- create or review existing security plan to determine the appropriate encryption methods
- rank and document appropriate encryption methods
- implement encryption systems and inform users of any impacts
- monitor and document encryption issues and compromises, and notify appropriate person.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain certificate related infrastructure (certificate authorities, registration authorities, repository services)
- summarise common asymmetric key algorithms and their usage
- explain common symmetric key algorithms and their usage, such as:
  - advanced encryption standard (AES)
  - data encryption standard (DES)
  - triple data encryption algorithm (triple DES)
  - Blowfish
- explain encryption strength
- summarise various encryption types, including public key, secret key, hash key
- summarise the functions and features of:
  - access control permissions
  - digital signatures
  - symmetric encryption, asymmetric encryption and one-way encryption
  - timestamps
- explain one-way message digests, such as message digest algorithm 5 (MD5) and secure hash algorithm (SHA)
- explain public key infrastructure (PKI), pretty good privacy (PGP) and GNU Privacy Guard (GnuPG)
- outline replay security
- outline possible sources of security threats, including eavesdropping, data interception, data corruption, data falsification and authentication issues
- explain transmission control protocol or internet protocol (TCP/IP) protocols and applications
- summarise security problems and challenges that arise from organisational issues
- outline wired equivalent privacy (WEP), Wi-Fi protected access (WPA) and Wi-Fi protected access 2 (WPA2).

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where encryption installation may be conducted
- a live network
- servers
- encryption software
- encryption tools.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK503 Install and maintain valid authentication processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, develop, install and maintain authentication processes to reduce the vulnerability of the system.

It applies to individuals working as middle managers such as information security managers, network engineers or security analysts, who are responsible for implementing and monitoring the organisational security management system.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine authentication requirements	1.1 Determine user and enterprise security requirements with reference to enterprise security plan 1.2 Identify and analyse authentication options according to user and enterprise requirements 1.3 Select the most appropriate authentication and authorisation processes
2. Configure authentication software or tools	2.1 Create an authentication realm and reuse as required to protect different areas of server 2.2 Add users and authorisation rules to new realm according to business needs 2.3 Describe user attributes and user attribute set-up 2.4 Set up an authentication filter and authorisation parameters on the appropriate server according to business requirements
3. Apply authentication methods	3.1 Develop or obtain authentication protocols as required 3.2 Develop and distribute related methods to users according to business need 3.3 Brief user on authentication system and their responsibilities according to enterprise security plan 3.4 Apply authentication system to network and user according to system product requirements 3.5 Record and store permission and configuration information in a secure central location
4. Monitor authentication system	4.1 Review the authentication system according to user and enterprise security and quality of service requirements 4.2 Ensure ongoing security monitoring, using incident management and reporting processes, according to enterprise security plan 4.3 Adjust authentication system if required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.3, 4.2	• Gathers, interprets and analyses technical data to determine requirements according to user and enterprise plans
Writing	2.3, 3.1, 3.2, 3.5	• Prepares workplace documentation that incorporates an evaluation of technical information and specialised and cohesive language in a format and style appropriate for a specific audience
Oral Communication	1.2, 3.1-3.3, 4.2	• Uses active listening, observational and questioning techniques in order to identify information and confirm, clarify or revise understanding • Initiates and contributes to a range of formal and informal conversations relevant to role, responding, clarifying, explaining and expanding on information as required
Navigate the world of work	1.1, 3.3	• Recognises and follows explicit and implicit protocols, and meets expectations associated with own role
Get the work done	1.1, 1.3, 2.1, 2.2, 2.4, 3.4, 3.5, 4.1-4.3	• Reflects on the ways in which digital systems and tools are used or could be used to achieve work goals and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely when implementing and monitoring a system with a growing awareness of the permanence and transparency of all activities • Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan control methods and systems processes • When dealing with complex issues such as authentication failure and security incidents may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues and using lateral thinking processes to generate possible solutions • Makes decisions in relatively complex situations, taking a range of factors into consideration

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK503 Install and maintain valid authentication processes	ICANWK503A Install and maintain valid authentication processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK503 Install and maintain valid authentication processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and deploy authentications solutions to the business technology environment and business needs
- configure authentication software or tools
- monitor and test authentication process after implementation
- ensure authentication solutions are current.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the problems and challenges dealing with organisational authentication issues, including resource accounting through authentication
- discuss common virtual private network (VPN) issues, including:
  - quality of service (QoS) considerations
  - bandwidth
  - dynamic security environment
  - function and operation of VPN concepts
- outline authentication adaptors
- summarise biometric authentication adaptors
- summarise digital certificates, such as VeriSign, X.509, and SSL
- explain the function and operation of authentication controls including:
  - passwords
  - personal identification numbers (PINs)
  - smart cards
  - biometric devices
  - other authentication protocols
- outline network authentication services, such as Kerberos and NT LAN Manager (NTLM)
- summarise the features of common password protocols, such as:
  - challenge handshake authentication protocol (CHAP)
  - challenge phrases
  - password authentication protocol (PAP)
  - remote authentication dial-in user service (RADIUS) authentication
- describe the principles of security tokens.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype where network authentication may be implemented and managed
- network support tools currently used in industry
- organisational security policies related to authentication
- manufacturers recommendations
- current authentication standards, including biometric authentication adaptors.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK504 Design and implement an integrated server solution

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and implement a network authentication model that allows users to log in using the same user credentials between multiple operating system platforms to provide a secure method of sharing files on the same network.

It applies to individuals employed in network or systems engineering roles where they are required to support multiple operating systems in a complex computing environment of medium-to-large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for the design and installation of an integrated server solution	1.1 Consult with client and key stakeholders to identify server integration requirements 1.2 Prepare for work, according to site specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures 1.3 Arrange access to site and advise client of deployment and potential down times 1.4 Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Plan and design integrated server solution	2.1 Research and review authentication methods available for integration of network operating systems 2.2 Select appropriate authentication methods and protocols 2.3 Research redundancy and replication requirements for selected authentication model 2.4 Produce the integrated server design, including authentication, file sharing and security
3. Install and configure the integrated server solution	3.1 Implement integrated authentication solution 3.2 Implement integrated file sharing solution 3.3 Configure workstations for integrated environment 3.4 Implement security for the integrated server environment
4. Test and reconfigure network servers	4.1 Test server for benchmarking against client specification and requirements according to test plan, and record outcomes 4.2 Analyse error report and make changes as required 4.3 Use troubleshooting tools and techniques to diagnose and correct integration problems 4.4 Test required changes or additions 4.5 Validate changes or additions against specifications
5. Complete and document network design and installation	5.1 Make and document server configuration and operational changes 5.2 Complete client report and notification of server status 5.3 Clean up and restore worksite to client's satisfaction

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ELEMENT	PERFORMANCE CRITERIA
	5.4 Secure sign-off from appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.3, 4.1, 4.2, 4.5	• Gathers, interprets and analyses enterprise procedures, manuals and specifications to determine requirements
Writing	2.4, 4.1, 5.1, 5.2	• Prepares workplace documentation that incorporates an evaluation of technical information and specialised and cohesive language in a format and style appropriate for a specific audience
Oral Communication	1.1, 1.3, 1.4	• Uses active listening, observational and questioning techniques to identify information and confirm, clarify or revise understanding
Numeracy	4.1, 4.2, 4.4, 4.5	• Analyses numerical information to take measurements, interpret results and evaluate performance and interoperability of network
Navigate the world of work	1.2	• Appreciates the implications of legal and regulatory responsibilities related to own work
Interact with others	5.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.3, 2.1, 2.2, 2.4, 3.1-3.4, 4.1-4.5, 5.1, 5.3	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, prioritise and monitor own work • Understands the key principles and concepts underpinning the design and operation of digital systems and tools, and applies these when troubleshooting existing technology • Initiates standard procedures and contingency management skills when responding to familiar problems to adapt configuration procedures to requirements of network and reconfigure, depending on differing operational contingencies, risk situations and environments • Makes a range of decisions in relatively complex situations, taking a range of constraints into account

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK504 Design and implement an integrated server solution	ICANWK504A Design and implement an integrated server solution	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK504 Design and implement an integrated server solution

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce design documents to integrate multiple server operating systems for authentication, file sharing and security
- install and configure the integrated solution according to the produced design
- monitor and test the solution
- troubleshoot integration problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain authentication methods and protocols, such as lightweight directory access protocol (LDAP) and Kerberos
- summarise compatibility issues and resolution procedures
- outline current network operating systems (NOS)
- describe current server applications, compatibility issues and resolution procedures
- list documentation required for networks
- outline error and event logging and reporting
- summarise file and print management
- explain file system security
- outline high availability options for servers
- summarise network file systems and shares
- outline network service configuration and security
- summarise operating system help and support utilities
- list and describe performance monitoring tools and tuning options
- describe the process of managing a project, including:
  - process or task management
  - task scheduling utilities
- explain troubleshooting tools and techniques, including network diagnostic utilities
- describe user authentication and directory services.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where server installation may be conducted
- relevant server specifications such as:
  - multiple operating system platforms
  - cabling
- networked (LAN) computers
- server diagnostic software
- switching equipment
- client requirements
- workstations
- relevant regulatory documentation that affects installation activities.

Assessors must satisfy NVR/AQTF assessor requirements.

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Links

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ICTNWK505 Design, build and test a network server

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, install and test a server in a complex network environment.

It applies to individuals who are employed in network or systems engineering roles, such as network engineers who are required to design and build network servers in a complex computing environment of medium-to-large organisations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and design network servers to meet business requirements	1.1 Consult with client and key stakeholders to identify requirements 1.2 Assess business problems, opportunities, scope, objectives and budget, confirming details with appropriate person 1.3 Analyse and document data migration requirements 1.4 Review requirements to identify network server specifications 1.5 Produce detailed documentation for the design and configuration of the network services, server applications, security and redundancy 1.6 Prototype design and update documentation as necessary 1.7 Produce installation checklists as part of the quality assurance process 1.8 Develop the test plan to ensure that the system meets client requirements, performance standards and quality expectations 1.9 Obtain client sign-off for the design report
2. Prepare for network server installation	2.1 Prepare for work according to site specific safety requirements and enterprise workplace health and safety (WHS) processes and procedures 2.2 Identify safety hazards and implement risk control measures in consultation with appropriate personnel 2.3 Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite 2.4 Back up local data in preparation for installation
3. Build and configure the servers according to design	3.1 Install network operating system to design specifications using installation checklists 3.2 Install additional tools or third-party software applications as required by the design 3.3 Patch the operating system and applications to ensure maximum security and reliability 3.4 Configure network services and applications 3.5 Implement security design to prevent unauthorised access to

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ELEMENT	PERFORMANCE CRITERIA
	system 3.6 Reconnect and reconfigure connectivity devices 3.7 Configure update services to provide automatic updates for operating system and applications 3.8 Restore local data to new server 3.9 Implement backup and recovery methods to enable restoration capability in the event of a disaster
4. Test and reconfigure network servers	4.1 Test server for benchmarking against client specification and requirements according to test plan, and record outcomes 4.2 Analyse the error report and make changes as required 4.3 Use troubleshooting tools and techniques to diagnose and correct server problems 4.4 Test required changes or additions 4.5 Validate changes or additions against specifications
5. Complete and document network design and installation	5.1 Make and document server configuration and operational changes 5.2 Complete client report and notify of server status 5.3 Clean up and restore worksite to client's satisfaction 5.4 Secure sign-off from appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.4, 3.1, 3.2, 4.1, 4.2, 4.5	• Gathers and interprets enterprise procedures, manuals and specifications to determine requirements
Writing	1.3, 1.5, 1.6, 4.1, 5.1, 5.2	• Prepares workplace documentation that incorporates an evaluation of technical information and specialised language in a format and style appropriate for a specific audience
Oral Communication	1.1, 1.2, 2.2, 2.3, 5.2	• Uses active listening, observational and questioning techniques in order to identify information and confirm, clarify or revise understanding • Articulates requirements clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	1.2, 4.2	• Analyses numerical information to take measurements, interpret results and evaluate performance and interoperability of network • Uses mathematical formulas and calculations to estimate and plan project costs within a defined budget
Navigate the world of work	2.1, 2.2, 5.3	• Understands the nature and purpose of own role and associated responsibilities, and how it contributes to the work of others in the immediate work context • Keeps up to date with current legislation and regulations relevant to own rights and responsibilities, and considers the implications of these when planning and undertaking work
Interact with others	1.9, 5.4	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.2, 1.3, 1.7, 1.8, 2.4, 3.1- 3.9, 4.1-4.5, 5.1	• Reflects on the ways in which digital systems and tools are used or could be used to achieve work goals and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely when implementing and monitoring a system, with a growing awareness of the

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		permanence and transparency of all activities • Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, prioritise and monitor own work • Uses formal and informal processes to monitor implementation of solutions and reflect on outcomes • Makes decisions in relatively complex situations, taking a range of factors into consideration

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK505 Design, build and test a network server	ICANWK505A Design, build and test a network server	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK505 Design, build and test a network server

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a design report for a server (or servers) with complex user and network service requirements
- install and configure the server according to the produced design
- monitor and test the server
- troubleshoot server and network failures
- configure a wide range of server network and security services, including:
  - domain name system (DNS)
  - dynamic host configuration protocol (DHCP)
  - web and proxy mail
  - file transfer protocol (FTP)
  - firewall.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of current network operating systems (NOS)
- identify and describe current server applications compatibility issues and resolution procedures
- discuss network service configuration, including:
  - domain name system (DNS)
  - dynamic host configuration protocol (DHCP)
  - file transfer protocol (FTP)
  - mail
  - network time protocol (NTP)
  - proxy
  - server messages block (SMB)
  - web
- describe common network service management, including:
  - start
  - stop
  - restart
  - start on boot
- identify and describe network service security features, including server firewall configuration
- identify and summarise troubleshooting tools and techniques, including network diagnostic utilities
- describe common operating system installation and operation issues, including:
  - installation media:
    - CD
    - DVD
    - universal serial bus (USB)
    - boot disk
    - network and script (automated install)
    - deployment services
  - boot process and diagnosing boot failures
  - operating system rescue environment
  - operating system help and support utilities
  - performance monitoring tools and tuning options
  - compatibility issues and resolution procedures
  - high availability options for servers
  - file and print management
- describe data security and storage measures required on a networked server, including:
  - user authentication and directory services
  - best practice procedures for implementing backup and recovery
  - error and event logging and reporting
  - storage options, including file systems and disk partitioning schemes
- describe the process of managing a project, including:
  - documentation skills required for networks

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- process or task management
- task scheduling utilities.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where server installation may be conducted
- relevant server specifications
- cabling
- networked (LAN) computers
- server diagnostic software
- switching equipment
- client requirements
- wide area network (WAN) service point of presence
- workstations
- relevant regulatory documentation that affects installation activities.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate, and troubleshoot medium enterprise switches.

It applies to individuals with excellent communication skills who are working as help desk technicians and network support technicians.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to install medium enterprise WAN links	1.1 Prepare for given work according to legislation, work health and safety (WHS) codes, regulations and standards 1.2 Arrange access to the site according to required procedure 1.3 Review existing network design documentation to ensure it is current and complete 1.4 Select network elements required to be installed to meet technical requirements 1.5 Contact vendors and service suppliers to obtain specifications and availability of identified components 1.6 Develop plans, with prioritised tasks and contingency arrangements, for installation of components with minimum disruption to client 1.7 Liaise with appropriate person to obtain approval for the plans, including security clearance and timing
2. Configure WAN links	2.1 Determine different methods for connecting to a wide area network (WAN) 2.2 Configure and verify a basic serial WAN configuration 2.3 Configure and verify at least two WAN protocols 2.4 Determine virtual private network (VPN) technology 2.5 Configure and verify a site-to-site VPN 2.6 Determine asymmetric digital subscriber line (ADSL) technology 2.7 Configure and verify an ADSL connection
3. Configure and verify IP services on a router	3.1 Determine the operation and benefits of using dynamic host configuration protocol (DHCP) 3.2 Configure and verify DHCP operation on a router 3.3 Implement static and dynamic addressing services for hosts in a local area network (LAN) environment 3.4 Determine the basic operation of network address translation (NAT) 3.5 Configure NAT for given network requirements 3.6 Implement and verify NAT in a medium sized enterprise

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ELEMENT	PERFORMANCE CRITERIA
	branch office network 3.7 Describe the basic operation and configuration of internet protocol version 6 (IPv6)
4. Secure a network using router services	4.1 Determine the purpose and types of access control lists (ACLs) 4.2 Configure and apply ACLs based on network filtering requirements 4.3 Configure and apply ACLs to provide secure access to the router
5. Troubleshoot medium enterprise WAN links	5.1 Troubleshoot WAN implementation issues 5.2 Rectify WAN problems 5.3 Document solutions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3	• Gathers, interprets and analyses technical information to determine requirements according to client needs
Writing	1.5, 1.6, 2.1, 4.1, 5.3	• Prepares workplace documentation which incorporates an evaluation of technical information and specialised and cohesive language in a format and style appropriate for a specific audience
Oral Communication	1.5, 1.7, 2.1, 2.4, 2.6, 3.1, 3.4, 3.7, 4.1	• Uses specific and relevant language to clearly describe and explain a range of technical, operational and business related matters with internal and external personnel • Uses listening and questioning skills to confirm understanding for requirements, participates in a verbal exchange of ideas/solutions and uses appropriate, detailed and clear language to address key personnel and to disseminate information
Numeracy	2.2, 2.3, 2.5, 2.7, 3.2, 3.5, 4.2, 4.3	• Analyses numerical information to take measurements, interpret results and evaluate performance and interoperability of network
Navigate the world of work	1.1	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1, 1.2, 1.4, 1.6, 2.2, 2.3, 2.5, 2.7, 3.2, 3.3, 3.5, 3.6, 4.2, 4.3, 5.1, 5.2	• Reflects on the ways in which digital systems and tools are used or could be used to achieve work goals, and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely when implementing and monitoring a system, with a growing awareness of the permanence and transparency of all activities • Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, prioritise and monitor own work • Makes decisions in relatively complex situations, taking a range of factors into

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		consideration • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues, and lateral thinking processes to generate possible solutions

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network	ICANWK506A Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and prepare for the wide area network (WAN) link installation task
- install and configure WAN links
- configure and troubleshoot the following internet protocol (IP) services:
  - network address translation (NAT)
  - dynamic host configuration protocol (DHCP)
  - access control lists (ACLs)
  - configure and troubleshoot ADSL links
  - configure and troubleshoot VPNs
- document solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the basic operation and configuration of internet protocol version 6 (IPv6)
- identify and describe typical router setup and operations, including:
  - ACLs
  - router calling line identification (CLI) configuration
  - router debug commands
- explain typical problems and solutions with WAN link installations.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- WAN service point of presence.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK507 Install, operate and troubleshoot medium enterprise routers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use the appropriate tools, equipment, software and protocols to install, operate and troubleshoot, medium enterprise routers.

It applies to individuals working as network technicians, network administrator and network support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to install a medium enterprise router	1.1 Prepare for given work, according to legislation, workplace health and safety (WHS), codes, regulations and standards 1.2 Arrange the access to the network facility, according to the required procedures 1.3 Review the existing network design documentation to ensure that it is current and complete 1.4 Select the network elements required to be installed, to meet the technical requirements 1.5 Contact vendors and service suppliers to obtain the specifications, and determine the availability of the identified components 1.6 Develop plans, with prioritised tasks and contingency arrangements, for the installation of components with minimum disruptions to the client 1.7 Liaise with the appropriate person to obtain approval for the plans, including security and timing
2. Configure the basic router operation	2.1 Determine the basic routing requirements 2.2 Determine the router operating parameters 2.3 Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts 2.4 Access and use the router to set basic parameters 2.5 Upgrade the firmware on a router 2.6 Save and back up the router configuration files 2.7 Implement basic router security 2.8 Configure the static and default routes
3. Configure, and verify, the dynamic classless routing protocols	3.1 Determine the appropriate classless addressing scheme, using variable length subnet mapping (VLSM) and summarisation to satisfy addressing requirements in a local area network (LAN) or a wide area network (WAN) environment 3.2 Calculate and apply an addressing scheme, including a VLSM internet protocol (IP) addressing design, to a network 3.3 Configure and verify, the classless routing protocols

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ELEMENT	PERFORMANCE CRITERIA
4. Apply sound troubleshooting processes to determine network connectivity	4.1 Troubleshoot the device configuration and network connectivity using basic utilities 4.2 Identify and correct, common problems associated with IP addressing and host configurations 4.3 Perform basic troubleshooting principles to verify the network's operation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3	• Gathers, interprets and analyses technical and regulatory information, to determine the requirements according to client needs
Writing	1.5	• Uses factual information and industry-related terminology, to convey information to internal and external personnel on technical, operational and business-related matters
Oral Communication	1.5, 1.7, 2.1, 2.2	• Uses specific and relevant language to clearly describe and explain, a range of technical, operational and business-related matters, with internal and external personnel • Uses listening and questioning skills to confirm understanding for the requirements, participates in a verbal exchange of ideas/solutions, and uses appropriate, detailed and clear language to address key personnel, and to disseminate information
Numeracy	3.2, 3.3	• Analyses numerical information to take measurements, interpret results and evaluate the performance, and interoperability, of the network
Navigate the world of work	1.1	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1, 1.2, 1.4, 1.6, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3	• Reflects on the ways in which digital systems and tools are, or could be, used to achieve work goals, and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely, when implementing and monitoring a system, with a growing awareness of the permanence and transparency of all activities • Uses a combination of formal, logical planning processes, and an increasingly intuitive understanding of context to plan, prioritise and monitor own work, and coordinate processes, in liaison with others • Makes decisions in relatively complex

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		situations, taking a range of factors into consideration • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues, and uses lateral thinking processes to generate possible solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK507 Install, operate and troubleshoot medium enterprise routers	ICANWK507A Install, operate and troubleshoot medium enterprise routers	Updated to meet Standards for Training Packages. Minor changes to the wording of Element 4, and some Performance Criteria for clarity.	Equivalent unit

Links

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Assessment Requirements for ICTNWK507 Install, operate and troubleshoot medium enterprise routers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and prepare for the installation of an enterprise router
- design a classless internet protocol (IP) addressing scheme, to suit requirements
- install, configure and test the network elements, to ensure interoperability within the network
- apply network topologies, routing and security protocols
- apply solutions, and troubleshoot any defined network problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the basic routing concepts for small enterprise network switches and routers
- outline classless routing protocols, including:
  - enhanced interior gateway routing protocol (EIGRP)
  - open shortest path first (OSPF)
  - routing information protocol (RIPv2)
- summarise debug commands
- explain internet protocol version 4 (IPv4)
- summarise the purpose, and basic operation, of protocols in the open system interconnection (OSI) and transmission control protocol, or internet protocol (TCP/IP), models
- explain the router calling line identification (CLI) configuration.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where network installation may be conducted
- enterprise routers and operating systems
- hardware and software
- the organisational guidelines
- computers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK508 Install, operate and troubleshoot medium enterprise switches

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate, and troubleshoot medium enterprise switches.

It applies to individuals working as help desk technicians and network support technicians.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to install a medium enterprise switch	1.1 Prepare for given work according to legislation, workplace health and safety (WHS), codes, regulations and standards 1.2 Arrange access to the site according to required procedure 1.3 Review existing network design documentation to ensure it is current and complete 1.4 Select the network elements required to be installed to meet the technical requirements 1.5 Contact vendors and service suppliers to obtain specifications and availability of identified components 1.6 Develop plans, with prioritised tasks and contingency arrangements, for installation of components with minimum disruption to client 1.7 Liaise with appropriate person to obtain approval for the plans, including security clearance and timing
2. Configure basic switch operation	2.1 Determine network segmentation, basic traffic management and basic switching requirements 2.2 Perform, save and verify initial switch configuration tasks 2.3 Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts 2.4 Perform, save and verify initial switch configuration tasks 2.5 Upgrade firmware on a switch 2.6 Save and back up switch configuration files 2.7 Implement basic switch security
3. Configure and verify advanced switching functions	3.1 Determine enhanced switching technologies 3.2 Configure and verify virtual local area networks (VLANs) 3.3 Configure and verify trunks between switches 3.4 Configure and verify inter-VLAN routing 3.5 Configure and verify spanning tree protocol (STP) and rapid spanning tree protocol (RSTP) operation
4. Troubleshoot medium enterprise switches	4.1 Troubleshoot device configuration and network connectivity using basic utilities

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ELEMENT	PERFORMANCE CRITERIA
	4.2 Identify and resolve common switched network issues

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3	• Gathers, interprets and analyses technical and regulatory information to determine requirements according to client needs
Writing	1.6	• Uses factual information and industry-related terminology to convey information to internal and external personnel on technical, operational and business related matters
Oral Communication	1.5, 1.7, 2.1, 3.1	• Uses active listening, observational and questioning techniques to identify information and confirm, clarify or revise understanding • Articulates requirements clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	3.2-3.5	• Analyses numerical information to take measurements, interpret results and evaluate performance and interoperability of network
Navigate the world of work	1.1	• Appreciates the implications of legal and regulatory responsibilities related to own work
Get the work done	1.1, 1.2, 1.4, 1.6, 2.2-2.7, 3.2-3.5, 4.1, 4.2	• Reflects on the ways in which digital systems and tools are used or could be used to achieve work goals, and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely when implementing and monitoring a system, with a growing awareness of the permanence and transparency of all activities • Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, prioritise and monitor own work and coordinate processes in liaison with others • Makes decisions in relatively complex situations, taking a range of factors into consideration • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues, and uses lateral thinking processes to generate possible solutions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence unit
ICTNWK508 Install, operate and troubleshoot medium enterprise switches	ICANWK508A Install, operate and troubleshoot medium enterprise switches	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK508 Install, operate and troubleshoot medium enterprise switches

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare for the installation of an enterprise switch
- install, configure and test network elements to ensure interoperability within the network
- apply network topologies, protocols and security issues
- apply solutions and troubleshoot defined network problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe switches and their operation
- describe the installation requirements of switches, including:
  - debug commands
  - routing between virtual local area networks (VLANs)
  - spanning tree protocol (STP)
  - switch calling line identification (CLI) commands
  - switch security, including:
    - port deactivation
    - port security
    - secure shell (SSH)
  - advanced switching technologies
  - common network switching issues
- identify and describe the different types of network and related equipment
- outline the types of documentation required when installing switches.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where network installation may be conducted
- enterprise switches and operating systems
- equipment specifications
- hardware and software
- organisational guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK509 Design and implement a security perimeter for ICT networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build a high performance, high security, failure resistant security perimeter, for an enterprise information and communications technology (ICT) network.

It applies to individuals with excellent ICT expertise who are working as middle managers, including information security managers, network engineers, network technicians and security analysts.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and design firewall solution	1.1 Determine level and nature of security needed to meet enterprise requirements 1.2 Identify security threats 1.3 Research available perimeter security options 1.4 Design security perimeter to meet identified enterprise requirements
2. Configure perimeter to secure network	2.1 Deploy perimeter devices according to design 2.2 Configure perimeter topology 2.3 Configure basic functionality of devices to allow access 2.4 Configure advanced functions
3. Plan, design and configure network devices to provide secure fallover and redundancy	3.1 Back up device configuration 3.2 Design and configure perimeter to enable continuity of service during upgrade of devices 3.3 Design and configure perimeter to enable continuity of service in the event of device failure
4. Plan, design and configure a VPN solution	4.1 Configure perimeter for site-to-site virtual private networks (VPNs) 4.2 Configure perimeter as a remote access VPN server 4.3 Configure perimeter to allow VPN tunnel forwarding 4.4 Diagnose and resolve VPN connectivity issues
5. Test and verify design performance	5.1 Test functionality of basic features 5.2 Test functionality of advanced features 5.3 Perform penetration testing to verify that the perimeter meets security requirements 5.4 Monitor perimeter device performance 5.5 Monitor security breaches 5.6 Document test results and report to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.4	• Gathers, interprets and analyses technical and enterprise information to determine requirements according to client needs
Writing	1.4, 3.2, 3.3, 5.6	• Uses factual information and industry related terminology to convey complex technical information, and notes security breaches for client records to clients on technical, operational and business related matters
Oral Communication	1.1, 5.6	• Uses active listening, observational and questioning techniques in order to identify information and confirm, clarify or revise understanding • Reports test results clearly and distinctively, using technical language appropriate to audience and environment
Numeracy	2.3, 2.4, 3.2, 3.3, 4.1-4.3, 5.3	• Selects from and applies an expanding range of mathematical and problem solving strategies to design and configure advanced features of perimeter devices and an integrated VPN solution
Get the work done	1.1, 1.2, 2.1-2.4, 3.1-3.3, 4.1-4.4, 5.1- 5.5	• Reflects on the ways in which digital systems and tools are used or could be used to achieve work goals, and begins to recognise strategic and operational applications • Uses digital technologies and systems safely and securely when implementing and monitoring a system, with a growing awareness of the permanence and transparency of all activities • Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to plan, prioritise and monitor own work, and coordinate processes in liaison with others • Makes decisions in relatively complex situations, taking a range of factors into consideration • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to meet security requirements and resolve other technical problems

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTNWK509 Design and implement a security perimeter for ICT networks	ICANWK509A Design and implement a security perimeter for ICT networks	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK509 Design and implement a security perimeter for ICT networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify threats to perimeter security
- develop design for a secure perimeter
- deploy perimeter to meet security requirements
- design and configure advanced features of perimeter devices to provide additional services
- design and configure an integrated VPN solution
- conduct exhaustive testing of perimeter.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe emerging security issues and the need for security policies
- describe the security perimeter issues related to networks, including:
  - auditing and penetration testing techniques
  - capabilities of software and hardware perimeter solutions
  - logging analysis techniques
  - organisational network infrastructure
  - security technologies according to perimeter design
  - weaknesses of installed perimeter design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- site or prototype where perimeter security may be implemented and managed
- perimeter devices
- organisational security requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK510 Develop, implement and evaluate system and application security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, implement and evaluate information security in an information and communications technology (ICT) system or application during the system development life cycle (SDLC), prior to the operations and maintenance phase.

It applies to individuals with excellent information and communications technology (ICT) expertise who are working as network managers and are required to handle system and application security from the development phase through implementation to evaluation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop system and application security	1.1 Identify enterprise ICT system or application security policies 1.2 Identify security requirements for the ICT system or application 1.3 Write an ICT system or application security plan according to the enterprise and ICT system or application security policies 1.4 Identify standards against which to engineer the ICT system or application 1.5 Identify criteria for performing risk based audits against the ICT system or application 1.6 Develop processes and procedures to mitigate the introduction of vulnerabilities during the engineering process 1.7 Integrate applicable information security requirements, controls, processes, and procedures into ICT system and application design specifications according to established requirements
2. Implement system and application security	2.1 Execute enterprise and ICT system or application security policies 2.2 Apply and verify compliance with identified standards against which to engineer the ICT system or application 2.3 Perform processes and procedures to mitigate the introduction of vulnerabilities during the engineering process 2.4 Perform secure configuration management practices 2.5 Validate that the engineered ICT system and application security controls meet the specified requirements 2.6 Re-engineer security controls to mitigate vulnerabilities identified during the operations phase 2.7 Ensure integration of information security practices throughout the SDLC process 2.8 Document ICT system or application security controls addressed within the system 2.9 Practise secure coding
3. Evaluate system and	3.1 Review new and existing risk management technologies to

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ELEMENT	PERFORMANCE CRITERIA
application security	achieve an optimal enterprise risk posture 3.2 Review new and existing ICT security technologies to support secure engineering across the SDLC phases 3.3 Continually assess effectiveness of the information system controls based on risk management practices and procedures 3.4 Assess and evaluate system compliance with corporate policies and architectures 3.5 Assess system maturation and readiness for promotion to the production stage 3.6 Collect lessons learned from integration of information security into the SDLC and use to identify improvement actions 3.7 Collect, analyse and report performance measures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.6	• Builds on prior knowledge and experience to clarify, extend understanding and contribute to ongoing organisational improvement
Reading	1.1-1.4, 1.7, 2.2, 3.4, 3.7	• Gathers, interprets and analyses technical and regulatory information to determine requirements according to client needs
Writing	1.3, 2.8, 3.7	• Uses factual information and industry related terminology to produce workplace documents
Oral Communication	3.7	• Conveys information about performance measures clearly, using specific and relevant language suitable to audience • Uses listening and questioning techniques to confirm understanding
Navigate the world of work	1.1, 1.3, 1.7	• Takes full responsibility for identifying and considering relevant policies and legislative requirements in the development of system security processes
Get the work done	1.5-1.7, 2.1, 2.3-2.7, 2.9, 3.1-3.5	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and reduce risks • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks • Makes a range of critical decisions in relatively complex situations, taking a range of constraints into account

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK510 Develop, implement and evaluate system and application security	ICANWK510A Develop, implement and evaluate system and application security	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK510 Develop, implement and evaluate system and application security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create an information and communications technology (ICT) system or application security plan
- implement system and application security
- apply and verify compliance with the identified standards
- practise secure coding practices
- assess and evaluate system compliance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise a range of programming languages, including those used by the organisation
- summarise best practice in application of language syntax rules
- explain data structures
- outline graphical user interfaces (GUIs)
- summarise small-size application development
- identify and summarise the legislation, regulations and codes of practice that impact on network security
- describe the risk assessment process required in evaluating system vulnerabilities, including:
  - risk mitigation
  - security control selection
  - implementation and evaluation process
  - software security standards compliance.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- ICT business specifications
- information on the security environment, including laws and legislation, existing organisational security policies, organisational expertise and knowledge
- possible security environment, which also includes the threats to security that are, or are held to be, present in the environment
- risk analysis tools and methodologies
- ICT security assurance specifications
- application and system scenarios.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK511 Manage network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement and manage security functions throughout a network.

It applies to individuals with excellent information and communications technology (ICT) expertise who lead the development of strategic reviews of security and provide technical advice, guidance and leadership in resolution of specified problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define a process for designing security	1.1 Define planning phase for network security design 1.2 Define building phase for network security design 1.3 Define managing phase for network security design
2. Identify threats to network security	2.1 Determine why attacks occur 2.2 Determine who the attack may come from 2.3 Analyse common types of network vulnerabilities 2.4 Determine how attacks occur 2.5 Design a threat model to categorise treats
3. Analyse security risks	3.1 Determine elements of risk management 3.2 Determine assets that require protection 3.3 Categorise assets and calculate their value to the organisation 3.4 Create a risk management plan
4. Create a security design	4.1 Determine attacker scenarios and threats 4.2 Design security measures for network components 4.3 Obtain feedback and adjust if required 4.4 Develop security policies
5. Design and implement responses to security incidents	5.1 Design auditing and incident response procedure 5.2 Document security incidents 5.3 Implement configurations aligned with incident response procedure design 5.4 Test and sign off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	2.5, 3.4, 4.2, 4.4, 5.1, 5.2, 5.4	• Uses factual information and industry related terminology to develop organisational plans, security policies and document security breaches
Oral Communication	4.3	• Uses active listening, observational and questioning techniques in order to identify different perspectives and confirm and clarify understanding
Numeracy	3.3	• Calculates equipment costs in order to assess their business related value
Get the work done	1.1-1.3, 2.1-2.4, 3.1-3.3, 4.1, 4.2, 5.3, 5.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and reduce risks • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to plan control methods for managing system security • Makes a range of critical decisions in relatively complex situations, taking a range of constraints into account • Recognises and addresses complex problems, including systems processes and rapid deployment of solutions to problems involving failure and security incidents

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK511 Manage network security	ICANWK511A Manage network security	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK511 Manage network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify threats to security
- develop risk management plan
- design network security policies
- analyse and plan solutions to compromised networks and design incident response
- evaluate security information and use it to plan suitable control methods and countermeasures
- add network controls, according to system security policies, procedures and risk management plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- recognise and describe common ICT networks and their configuration
- identify and describe network attacks, vulnerabilities and related weaknesses of installed infrastructure, including:
  - security technologies
  - emerging security issues
- identify and describe network security measures, including:
  - auditing and penetration testing techniques
  - logging analysis techniques
  - organisational network infrastructure
  - capabilities of software and hardware solutions
  - general features of emerging security policies, with depth in security procedures
  - network management and security process controls
- explain network security implementation risk management plans and procedures, including:
  - network security planning
  - implementation
  - cost analysis and budgeting.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype where network security may be implemented and managed
- network support tools currently used in industry
- organisational security policies, manufacturer recommendations and security standards.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK513 Manage system security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement and manage security on an operational system.

It applies to individuals working in middle management in technical advice, guidance and leadership roles such as security managers and security analysts responsible for implementing and managing the organisations security management system.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse threats to system	1.1 Evaluate the organisation's system and verify that it meets enterprise guidelines and policies 1.2 Conduct risk analysis on system and document outcomes 1.3 Evaluate threats to the system and document findings 1.4 Compile and document human interactions with system
2. Determine risk category	2.1 Conduct a risk assessment on the system and categorise risks 2.2 Conduct a risk assessment on human operations and interactions with the system and categorise risks 2.3 Match risk plans to risk categories 2.4 Determine and plan resources by risk categories
3. Identify appropriate controls	3.1 Devise and put in place effective controls to manage risk 3.2 Design policies and procedures to cover user access of the system 3.3 Conduct training in the use of system-related policies and procedures 3.4 Monitor high-risk categories at specified periods 3.5 Categorise and record system breakdowns
4. Include controls in the system	4.1 Develop security plan and procedures to include in management system 4.2 Develop security recovery plan 4.3 Implement system controls to reduce risks in human interaction with the system
5. Monitor system tools and procedures	5.1 Review and monitor risks and controls, using a management review process 5.2 Review risk analysis process based on security benchmarks from vendors, security specialists and organisational reviews 5.3 Plan to re-evaluate system and identify new threats and risks

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 5.1, 5.2	• Gathers, interprets and analyses technical and enterprise information to determine requirements according to client needs
Writing	1.2-1.4, 2.1, 2.2, 3.2, 3.5, 4.1, 4.2	• Prepares information that incorporates a synthesis of knowledge, using information and communications technology (ICT) terminology and cohesive language in a format and style appropriate to a specific audience
Navigate the world of work	1.1	• Takes full responsibility for identifying and considering relevant policies and procedures when managing a security system
Interact with others	3.3	• Demonstrates an increasing capacity to manipulate oral, visual and or written formats to achieve a specific purpose with full command of vocabulary relevant to context
Get the work done	1.1-1.3, 2.1-2.4, 3.1, 3.4, 4.3, 5.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and reduce risks • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to develop a security plan and a security recovery plan • Makes a range of critical decisions in relatively complex situations, taking a range of constraints into account • Recognises and addresses complex problems involving participation in group solutions and analysis, and resolving issues for a mixed mode environment of people and systems processes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK513 Manage system security	ICANWK513A Manage system security	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK513 Manage system security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- implement and manage security functions on a system
- conduct risk assessment
- set up effective controls to manage risk
- develop security plan and security recovery plan
- monitor risks and controls
- review risk analysis process.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the general features of specific security technologies
- describe risk analysis techniques, with a focus on their general features, and depth in security procedures
- describe the common security requirements of a client's organisation, including:
  - threats
  - security techniques and technologies
- outline systems management and process control in relation to security
- explain systems technologies, including a broad summary of their general features and capabilities.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where system security may be implemented and managed
- use of utility tools currently used in industry
- organisational security policies
- manufacturer recommendations
- security standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK514 Model preferred system solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to fit a physical model into the design phase of the methodology.

It applies to individuals working as system designers who are required to model proposed solutions.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review and confirm information requirements and existing models	1.1 Review information requirements and clarify areas that are not understood 1.2 Identify organisational standards for developing models, and check the model development method for consistency with organisational goals 1.3 Identify assumptions and incorporate into modelling process 1.4 Identify goals and resolve into tasks required to be performed to obtain goals 1.5 Define internal tasks needed to perform identified goals
2. Resolve conflicts and inconsistencies	2.1 Identify missed opportunities arising from previous and current model development 2.2 Identify bottlenecks, overlooked functionalities and other issues, and resolve with client input as required
3. Build and test model	3.1 Develop model based on existing architecture 3.2 Document details of model, according to agreed project or organisational standards 3.3 Develop model according to project deliverables and acceptance criteria within determined timeframe and project constraints 3.4 Test model against the test plan 3.5 Document test data to ensure that test procedures validate performance of the model
4. Ensure that the model represents a workable solution	4.1 Ensure a consensus view of key information and communications technology (ICT) stakeholders is represented in model 4.2 Ensure model is checked by key ICT stakeholders to confirm common knowledge of the model and the proposed solution 4.3 Submit model to appropriate person for sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.2, 3.4, 3.5	• Recognises and interprets technical material and organisational standards to determine job requirements
Writing	3.2, 3.5	• Develops material for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	1.1, 2.2	• Clearly articulates requirements, using relevant language suitable to diverse audiences, and employs listening and questioning techniques to confirm understanding
Navigate the world of work	1.2	• Takes full responsibility for identifying and considering relevant policies and requirements in the development of preferred system solutions
Interact with others	4.2, 4.3	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.3-1.5, 2.1, 2.2, 3.1-3.4, 4.1	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a combination of formal and logical planning processes and an increasingly intuitive understanding of context to set benchmarks and identify project scope when developing a model • Makes a range of critical decisions in relatively complex situations, taking a range of constraints into account • Recognises and addresses complex problems in systems models and may seek advice from relevant experts

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK514 Model preferred system solutions	ICANWK514A Model preferred system solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK514 Model preferred system solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use two or more development tools
- develop specific areas of a system for further information or to confirm a software or hardware direction
- identify opportunities for expansion of the model
- test the model to a test plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the client business domain in relation to the organisational structure
- summarise current industry-accepted hardware and software products and standards
- explain modelling techniques and methodologies
- outline a range of development and test tools
- explain systems development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry and include access to:

- acceptance criteria
- client requirements
- future organisational business processes
- organisational and process goals
- project budget
- project deliverables
- standards for model development
- technical specifications
- a test plan.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK515 Develop configuration management protocols

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop administrative and technical procedures throughout the life cycle of a system, network, software and documentation project.

It applies to individuals working in a variety of information and communications technology (ICT) areas who develop and manage tasks that facilitate the development of a system, such as version control and naming standards.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish configuration management requirements	1.1 Establish identification standards for naming and version control of system, network, software and documentation to align with organisational needs 1.2 Establish tools and procedures for the required level of integration into the programming, system or network environment 1.3 Determine responsibilities for configuration management within the project and for ongoing support, including approval of changes 1.4 Determine the appropriate points for configuration of particular items
2. Establish control mechanisms	2.1 Establish methods for identification and recording of change requests in line with organisational guidelines 2.2 Establish acceptance criteria, test and acceptance processes and processes for approval of change requests in line with organisational guidelines 2.3 Establish security, access and management control criteria and quality benchmarks 2.4 Determine necessary audit trails and alerts for variations or non-conformance
3. Establish monitoring mechanisms	3.1 Establish mechanisms to identify software status throughout the software life cycle, or the status of the system or network during upgrading or reconfiguration 3.2 Determine management of records and status reports, including the history of baselines and their links to backups 3.3 Define target audiences and determine the level of detail required in the status reports 3.4 Integrate configuration management into general project management processes for monitoring and control purposes 3.5 Document control and monitoring mechanisms
4. Manage the release of the product to clients	4.1 Determine physical and functional completeness of items prior to release 4.2 Determine requirements for formal control of software

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ELEMENT	PERFORMANCE CRITERIA
	products and documentation 4.3 Determine policies for retention of baseline and master copies in line with safety, security and legislative requirements and organisational guidelines

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2, 4.3	• Recognises and interprets legislative, organisational and technical material to determine job requirements
Writing	1.1, 1.2, 2.1-2.3, 3.5, 4.2	• Develops a broad range of materials, such as administrative procedures, for a specific audience using clear and detailed language to convey explicit information, requirements and recommendations
Navigate the world of work	4.3	• Understands own legal rights and responsibilities, and is extending understanding of general legal principles applicable across work contexts
Interact with others	1.3	• Collaborates with others to achieve joint outcomes, playing a lead role in facilitating consensus
Get the work done	1.2-1.4, 2.1-2.4, 3.1- 3.4, 4.1, 4.2	• Develops plans to manage relatively complex, non-routine tasks with an awareness of how they may contribute to longer term operational and strategic goals • Uses formal and informal processes to monitor implementation of solutions • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information, and reflects on outcomes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK515 Develop configuration management protocols	ICANWK515A Develop configuration management protocols	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK515 Develop configuration management protocols

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop technical and administrative procedures for use during the software life cycle, system or network reconfiguration or the upgrade process, including:
  - quality processes
  - audit trials
  - version control
  - configuration management procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain benchmarking methodologies
- outline configuration management
- summarise control mechanisms, such as acceptance criteria, test and acceptance processes, and security, access and management control criteria
- explain monitoring mechanisms
- identify and describe standards, benchmarks and organisational guidelines that impact on management protocols
- outline project planning methodologies and tools
- summarise quality assurance and quality processes
- clarify safety, security and legislative requirements
- explain software development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- Computer aided software engineering (CASE) tools
- future organisational business processes
- organisational standards for documentation and version control
- project budget and timeframe
- project management process and hierarchy
- legislation and organisational guidelines
- technical specifications
- test plans.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK516 Determine best-fit topology for a local network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine the most appropriate way of networking computers to meet user needs and business requirements.

It applies to individuals in senior networking roles who are required to plan the most appropriate topology for a proposed network.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine user needs	1.1 Identify the different segments of the proposed network based on business requirements 1.2 Determine segment needs, using network functional analysis 1.3 Estimate traffic content and volumes based on business requirements 1.4 Develop a prioritised organisational network functional matrix
2. Develop local area network specification	2.1 Determine the resource requirements for each network segment on the basis of functional analysis 2.2 Analyse features of the physical environment for the effect on network design 2.3 Conduct a costing process for possible topology options 2.4 Consider topology options with reference to available resources and network functional matrix 2.5 Select and document appropriate network topology based on business requirements and functional analysis

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.5	• Interprets textual information obtained from a range of sources and determines how content may be applied to organisational requirements
Writing	2.5	• Develops material for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	1.3, 2.1, 2.3, 2.4	• Interprets numerical information and applies mathematical calculations to determine resource expenditure within predetermined constraints • Interprets numerical data to estimate traffic needs
Get the work done	1.1, 1.2, 1.4, 2.1, 2.2, 2.4, 2.5	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK516 Determine best-fit topology for a local network	ICANWK516A Determine best-fit topology for a local network	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK516 Determine best-fit topology for a local network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse business or organisational needs
- identify the most appropriate local area network (LAN), virtual private network (VPN) or wireless local area network (WLAN) topology
- document recommendations.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the typical network topologies for the following:
  - large and small LANs
  - wide area networks (WANs)
  - VPNs
  - virtual local area networks (VLANs)
  - WLANs
- identify and describe the typical components of a local network, including:
  - adaptor cards
  - bridges
  - Ethernet hardware
  - gateways
  - hubs
  - routers
- describe the software and programming requirements of a local network, including:
  - security protocols
  - transmission control protocol or internet protocol (TCP/IP)
- describe the business consideration for establishing a local network including:
  - growth projections and capacity planning
  - costs and queuing constraints
  - high and low speed links
  - redundancy paths
  - response time and reliability requirements
  - scope of operation
  - traffic flow patterns
  - traffic load
  - application requirements of users
- outline of installation requirements for local area networks:
  - cabling, particularly unshielded twisted pair (UTP), shielded twisted pair (STP) or optic fibre
  - characteristics and relative strengths and weaknesses of LAN network topologies
  - features and capabilities of current industry accepted hardware and software products
  - features of line sharing protocols.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- business requirements
- equipment specifications
- organisational and industry costing.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK517 Determine best-fit topology for a wide area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify the best way computers and local area networks (LANs) can be connected to make a wide area network (WAN).

It applies to individuals with excellent planning and information and communications technology (ICT) skills in networking areas who are required to research and recommend the most appropriate topology for a WAN.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify WAN needs	1.1 Identify the different LAN, wireless local area network (WLAN) or virtual private network (VPN) segments of the proposed WAN 1.2 Determine segment needs using functional analysis 1.3 Estimate traffic content and volumes according to expected organisational usage, by examining telecommunications infrastructure 1.4 Develop an organisational WAN functional matrix
2. Create WAN specification	2.1 Determine resource requirements for each LAN, WLAN or VPN segment on the basis of functional analysis 2.2 Consider and report how features of the physical environment affect WAN design 2.3 Choose a WAN service appropriate to the amount and type of traffic expected to access the WAN 2.4 Include redundant links in the proposed WAN connectivity for link backup purposes, in case the main link is disrupted 2.5 Document appropriate WAN service

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	2.2, 2.5	• Develops material for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	1.3, 1.4	• Undertakes complex functional calculus to develop a WAN functional matrix • Interprets numerical data to estimate traffic needs and calculate business expenses
Get the work done	1.1-1.3, 2.1-2.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues with reference to resource constraints

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK517 Determine best-fit topology for a wide area network	ICANWK517A Determine best-fit topology for a wide area network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK517 Determine best-fit topology for a wide area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- consider budget constraints and business needs
- identify the configuration for connecting a local area network (LAN), wireless local area network (WLAN) or virtual private network (VPN) into a wide area network (WAN)
- document the configuration.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the typical network topologies for the following networks:
  - large and small LANs
  - WANs
  - VPNs
  - virtual local area networks (VLANs)
  - WLANs
- identify and describe the typical components and technologies required for a WAN, including:
  - concepts and types of modems
  - internet protocol (IP) addressing
  - packet switching
  - routed or routable protocols, including IP, IPX and AppleTalk
  - router operations, including double data rate (DDR)
  - routing protocols, including routing information protocol (RIP), enhanced interior gateway routing protocol (EIGRP) and open shortest path first (OSPF)
  - transmission control protocols or internet protocols (TCPs/IPs)
  - relationship of asynchronous and synchronous communication
  - use of microwave and satellite communication in networking
- describe the business consideration for establishing a WAN, including:
  - constraints and costs
  - features of telecommunications infrastructure, including the difference between digital and analogue networks
  - growth projections and capacity planning
  - high or low speed links
  - protocols
  - redundancy paths
  - response time and reliability requirements
  - scope of operation
  - security
  - traffic flow patterns
  - traffic load
  - users and the applications expected.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- design documents relating to LANs to be incorporated into the WAN
- equipment specifications
- vendor product catalogues and costs.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK518 Design an enterprise wireless local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to conduct an internal and outdoor site survey, and design a complex wireless local area network (WLAN).

It applies to individuals working in the networking area who are required to evaluate client requirements and design an appropriate WLAN.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Document current network configuration	1.1 Obtain details of current network layout and parameters 1.2 Hold consultations with key stakeholders 1.3 Document the current network configuration, network topology and links to carrier
2. Research client needs	2.1 Identify the client's current needs 2.2 Determine future needs 2.3 Document current and future needs according to organisational requirements
3. Implement site survey	3.1 Select the appropriate diagnostic tools and measurement processes 3.2 Select test equipment and ensure calibration 3.3 Undertake site survey with minimum disruption to client and ensure safe working environment for users and survey personnel 3.4 Record physical infrastructure, building use, aesthetics and other issues that will impact on future network performance and acceptance by the client 3.5 Record radio frequency interference issues, sources and possible resolution 3.6 Document results of site survey
4. Develop specifications for upgrade of wireless network	4.1 Document the current network performance equipment and capacity for the expanded network 4.2 Assess interference issues relating to existing radio frequency, topographic barriers, climate, obstacles, transmission distances and construction materials 4.3 Assess optimum location and position of access points, repeaters, routers and other equipment 4.4 Develop cabling plans and repeater links, including power requirements 4.5 Determine frequency to be used based on client and user requirements

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ELEMENT	PERFORMANCE CRITERIA
5. Model network	5.1 Determine appropriate test and modelling routines 5.2 Determine estimated network traffic and planned growth 5.3 Test planned network using modelling tools and techniques 5.4 Document outcome of tests and revise design where required
6. Determine components for network	6.1 Select and test vendor products and equipment where appropriate 6.2 Consult others, including emerging industry bodies, for sustainable compatibility, economic running costs and user connectivity access 6.3 Finalise components list for suitability and vendor claims 6.4 Prepare implementation plans
7. Present design to client	7.1 Present the design in a clear and logical fashion 7.2 Provide advice to client on reasons for design choice 7.3 Inform the client of design limitations, performance expectations and possible unanticipated outcomes, including security threats 7.4 Obtain feedback from client 7.5 Undertake modifications to design if required 7.6 Complete final design documentation and seek client endorsement

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.3, 3.2, 7.4	• Recognises and interprets legislative, organisational and technical material to determine job requirements
Writing	1.3, 2.3, 3.4-3.6, 4.1, 4.4, 5.4, 6.3, 7.5, 7.6	• Develops a broad range of technical material and creates records for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	1.2, 6.2, 7.2-7.4, 7.6	• Uses listening and questioning skills to confirm understanding for requirements and participates in a verbal exchange of ideas/solutions • Uses appropriate, detailed and clear language to address stakeholders, users and industry bodies to disseminate information
Numeracy	3.2, 5.2, 6.2	• Interprets numerical data to estimate and project traffic needs, undertake a cost benefit analysis and accurately calibrate equipment
Navigate the world of work	3.3	• Understands own legal rights and responsibilities and is extending understanding of general legal principles applicable across work contexts
Interact with others	7.1	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1, 2.1, 2.2, 3.1-3.3, 3.5, 4.2-4.5, 5.1, 5.3, 6.1, 6.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital tools to access and organise complex data and analyse multiple sources of information for strategic purposes • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Takes responsibility for high-impact decisions in complex situations involving many variables

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		and constraints • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention on critical issues and variables

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK518 Design an enterprise wireless local area network	ICANWK518A Design an enterprise wireless local area network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK518 Design an enterprise wireless local area network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assess wireless network performance requirements for the client
- measure and diagnose wireless working environment
- produce wireless models and network specifications appropriate to client requirements
- produce wireless network designs and component lists
- document the design and obtain client approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe wireless network survey techniques, including:
  - audit and intrusion detection systems
  - auditing and penetration testing techniques
  - bandwidth and quality of service
  - factors affecting signal quality
- outline the key technical considerations for designing a wireless network, including:
  - features of antenna design
  - layer 2 and layer 3 design issues
  - impact of radio frequency
  - problems associated with topography and obstacles in radio transmission path
  - wireless topologies
  - wireless local area networks (WLAN) and wireless metropolitan access network (WMAN) solutions
- outline the key client organisation considerations when designing a wireless network, including:
  - small office home office (SOHO) and enterprise local area networks (LANs)
  - transmission control protocols or internet protocols (TCP/IP) and applications
  - wireless security strategies
  - security threats
- outline the software consideration when designing a wireless network, including:
  - network protocols and operating systems
  - security protocols, standards and data encryption.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- network infrastructure, including wireless hardware and software
- network technical requirements
- real or simulated wireless networks
- appropriate diagnostic equipment and standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK519 Design an ICT security framework

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to evaluate information and communications technology (ICT) security requirements for a new system and to plan for controls and contingencies.

It applies to individuals working in senior roles in the networking area who are required to design security for new ICT systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research ICT security requirements	1.1 Investigate and gather statutory, commercial and application security requirements 1.2 Assess impact on the existing ICT system 1.3 Identify additional ICT security requirements 1.4 Document security requirements and forward to appropriate person for approval
2. Conduct risk analysis	2.1 Identify security threats and determine security specifications, taking into account the internal and external business environment 2.2 Develop controls and contingencies to alleviate security threats 2.3 Identify the costs associated with contingencies 2.4 Document and forward recommendations to appropriate person for approval
3. Develop ICT security policy and operational procedures	3.1 Review feedback from appropriate person to determine how to manage security threats 3.2 Develop security policies based on the security strategy 3.3 Create and document work procedures based on the security policies 3.4 Document operating procedures and forward to appropriate person for approval 3.5 Take action to ensure confidentiality of client and user information 3.6 Apply statutory requirements to policy and procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1-3.3	• Recognises and interprets legislative, organisational and technical material to determine job requirements
Writing	1.4, 2.1, 2.4, 3.2-3.4	• Develops a broad range of procedural material for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	3.1	• Uses listening and questioning skills to confirm understanding for requirements and articulates information clearly and concisely
Numeracy	2.3	• Interprets numerical data to develop a broad plan, budget and strategy
Navigate the world of work	1.1, 3.6	• Understands own legal rights and responsibilities, and understands general legal principles applicable across work contexts
Interact with others	1.4, 2.4, 3.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.1-2.3, 3.5	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Uses digital technologies and systems safely and legally when gathering, storing, accessing and sharing information, with a growing awareness of the permanence and transparency of all activities • May operate from a broad conceptual plan, developing the operational detail in stages, and regularly reviewing priorities and performance • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention on critical issues and variables

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK519 Design an ICT security framework	ICANWK519A Design an IT security framework	Updated to meet Standards for Training Packages. Minor change to the title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK519 Design an ICT security framework

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and assess security framework requirements with consideration of statutory and commercial requirements
- determine the security risks and develop controls and contingencies
- identify costs associated
- document the security framework and obtain approval
- develop security policies and operating procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the design criteria for a security framework, including:
  - the client business domain
  - legislation relating to information and communications technology (ICT) security
  - current industry accepted hardware
  - current industry software products
  - security features and capabilities
  - operating systems
  - risk relating to ICT security
- identify and outline relevant privacy legislation
- identify and outline common security considerations for businesses, including:
  - typical environments
  - threats
  - policies and strategies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- information on the security environment
- laws or legislation
- existing organisational security policies
- organisational expertise
- ICT business specifications
- ICT security assurance specifications
- security environment, which also includes the threats to security that are, or are held to be, present in the environment
- risk analysis tools or methodologies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK520 Design ICT system security controls

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design the security controls that ensure an information and communications technology (ICT) system is both physically and legally secure.

It applies to individuals in a range of ICT areas who are required to guarantee the security of ICT systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review organisational security policy and procedures	1.1 Review business environment to identify existing requirements 1.2 Determine organisational goals for legal and security requirements 1.3 Verify security needs in a policy document 1.4 Determine legislative impact on business domain 1.5 Gather and document objective evidence on current security threats 1.6 Identify options for using internal and external expertise 1.7 Establish and document a standard methodology for performing security tests
2. Develop security plan	2.1 Investigate theoretical attacks and threats on the business 2.2 Evaluate risks and threats associated with the investigation 2.3 Prioritise assessment results and write security policy 2.4 Document information related to attacks, threats, risks and controls in a security plan 2.5 Review the security strategy with security approved key stakeholders 2.6 Integrate approved changes into business plan and ensure compliance with statutory requirements
3. Design controls to be incorporated into system	3.1 Implement controls in a procedurally organised manner to ensure minimum risk of security breach in line with organisational guidelines 3.2 Monitor each phase of the implementation to determine the impact on the business 3.3 Take corrective action on system implementation breakdown 3.4 Record implementation process 3.5 Evaluate corrective actions for risk 3.6 Plan risk assessment review process 3.7 Take action to ensure confidentiality throughout all phases of design

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.5, 3.1	• Recognises and interprets legislative, organisational and technical material to determine job requirements
Writing	1.3, 1.5, 1.7, 2.3, 2.4, 2.6, 3.4	• Develops a broad range of business reports for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	2.5	• Uses appropriate, detailed and clear language to address personnel and disseminate information in a group environment • Uses listening and questioning skills to confirm understanding for requirements, and participates in a verbal exchange of ideas/solutions
Navigate the world of work	1.2, 1.4, 2.6	• Keeps abreast of legislative or regulatory requirements relevant to own role and considers implications of any changes when planning and undertaking work
Get the work done	1.5, 1.6, 2.1-2.3, 3.1-3.3, 3.5-3.7	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles that may be adaptable in the future

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK520 Design ICT system security controls	ICANWK520A Design IT system security controls	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK520 Design ICT system security controls

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review organisational security policies and procedures
- establish realistic security procedures
- design security plan and controls for a system
- develop a security control strategy
- oversee the implementation and evaluation of the strategy.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe communications security, including human organisational interactions
- describe how to conduct an information security risk assessment
- identify and summarise internet security technologies and processes, including:
  - firewalls
  - physical security
  - security testing methods for performing security tests
  - wireless security
  - security threats
  - the impact of security policies, plans and strategies
  - general features of specific security technology
  - risk assessment
- describe current industry accepted security processes, including general features and capabilities of software and hardware solutions
- outline the legal and ethical standards expected when considering security controls, including:
  - ethics in information and communications technology (ICT)
  - privacy issues
  - legislation
- summarise the need for developing organisational guidelines, processes, policies and procedures.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- ICT security assurance specifications
- probability, frequency and severity of direct and indirect harm, loss or misuse of the ICT system
- risk analysis tools and methodologies
- an ICT environment in which there are security risks
- legislation, regulations and standards relating to security
- existing organisational security policies
- organisational expertise.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK521 Install, configure and test a payment gateway

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure and test a payment gateway that enables translation of electronic payment information provided online into a form accessible to a merchant processor.

It applies to individuals in the network or web development area who are required to build e-commerce facilities into websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare server and e-business software for payment site	1.1 Analyse client requirements and regulatory requirements 1.2 Evaluate payment software and select appropriate software to meet specifications, including security and privacy benchmarks 1.3 Review and compare online merchant options 1.4 Choose payment method with reference to business requirements and client expectations 1.5 Test payment software and evaluate to ensure suitability and compatibility with current system and to meet client needs
2. Install payment gateway	2.1 Install selected payment software 2.2 Establish online merchant account 2.3 Configure web pages and back-end solutions to handle requests and integrate with the database for each transaction 2.4 Obtain merchant account information from the financial institution 2.5 Implement appropriate security systems to protect the payment infrastructure 2.6 Configure payment gateway to accept the appropriate payment methods and transaction types according to business requirements
3. Test payment gateway	3.1 Check transaction server for functionality against expected performance benchmarks 3.2 Test gateway using transaction types 3.3 Verify transactions by using the administrative functions of chosen payment software 3.4 Document payment gateway

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 3.3	• Recognises and interprets organisational and technical material to determine job requirements
Writing	2.4, 2.6, 3.4	• Develops a range of reports for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	1.2, 1.5, 3.1	• Interprets numerical data to check payment transactions against expectations and requirements
Get the work done	1.2-1.5, 2.1-2.6, 3.1-3.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles that may be adaptable in the future • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention and remedying problems as they arise

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK521 Install, configure and test a payment gateway	ICANWK521A Install, configure and test a payment gateway	Updated to meet Standards for Training Packages.	Equivalent unit

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Assessment Requirements for ICTNWK521 Install, configure and test a payment gateway

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review client requirements and determine payment software
- install and configure the payment gateway
- test and verify transactions and functionality
- document completed payment gateway.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe online commerce systems and processes and their respective advantages/disadvantages, including:
  - batching verification
  - payment software products
  - public key infrastructure (PKI)
  - globally unique ID (GUID)
- describe the processes and techniques associated with implementing client-side shopping carts through active server pages (ASP) and interfacing with databases with ActiveX Data Objects (ADO)
- describe the relative advantages and disadvantages of credit card, digital cash and online cheque systems
- describe the relevance of Copyleft and Free Software Foundation
- outline electronic commerce modelling language (ECML)
- summarise encryption options for national and international business
- identify legislation, regulations and standards that influence online commerce, including:
  - copyright
  - intellectual property
  - privacy.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- appropriate servers and software
- payment software
- a simulated merchant account
- a website.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK522 Build decks using wireless markup language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create wireless markup language (WML) decks.

It applies to individuals who create specialised language intended for devices that implement the Wireless Application Protocol (WAP) specification, such as mobile phones. It provides navigational support, data input, hyperlinks, text and image presentation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design WML deck	1.1 Analyse existing hypertext markup language (HTML) page design and identify information to be accessible via hand-held device 1.2 Design deck logical structure, ensuring that deck size is kept within acceptable boundaries 1.3 Determine structure of content based on business needs and user requirements 1.4 Identify links between sets of cards 1.5 Design cards for user input or for the selection of more than one item
2. Create deck	2.1 Code each card in the deck, ensuring each card has an ID and a title 2.2 Create cards using language and practices compliant with the international WML standard 2.3 Use best practice coding standards in creating the deck 2.4 Avoid device specific features in creating the deck
3. Test deck	3.1 Test deck on multiple devices to ensure compatibility with as many hand-held devices as possible 3.2 Validate WML files by typing and submitting the uniform resource locator of the WML file or the WML validator 3.3 Ensure the <go> and <prev> tasks select the correct card in the deck 3.4 Ensure the tested WML files meet the needs of the business client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 2.2, 3.4	• Recognises and interprets technical material to determine and confirm job requirements
Writing	2.1, 2.2, 3.2	• Demonstrates sophisticated writing skills using specialised language, stylistic devices and appropriate conventions to express precise meaning
Oral Communication	1.3	• Uses listening and questioning skills to confirm understanding for requirements, and participates in a verbal exchange of ideas/solutions
Navigate the world of work	2.2, 2.3	• Recognises and responds to explicit and implicit protocols within familiar work contexts
Get the work done	1.2, 1.4, 1.5, 2.4, 3.1-3.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Monitors outcomes of decisions, considering results and identifying key concepts and principles that may be adaptable in the future • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention and remedying problems as they arise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK522 Build decks using wireless markup language	ICANWK522A Build decks using wireless markup language	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK522 Build decks using wireless markup language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse existing parameters
- design wireless markup language (WML) files that meet the business client's need
- create the code using appropriate language and standards
- test and validate compatibility and performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the internet standards and transmission control protocols and internet protocols (TCPs/IPs) relevant to WML
- define five layer protocol stack of TCP/IP and explain its function in applications development
- outline wireless application protocol (WAP)
- outline application communication protocols
- identify and apply WML code, including:
  - WMLScript
  - WMLScript specification
  - extensible markup language (XML) 1.0 standard
  - XML applications
- explain the following features of wireless:
  - application environment
  - datagram protocol
  - session protocol
  - transaction protocol
  - transport layer security
- identify and summarise the computer code of ethics as it applies to programming.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in networking, and include access to:

- XML parser
- WML valuator.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK524 Install and configure network access storage devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to select, install and test a network access storage (NAS) device in a local area network (LAN).

It applies to individuals who install, configure and test a NAS device.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine specifications for NAS	1.1 Determine and document the topology of the local area network (LAN) 1.2 Investigate and determine current and future storage requirements according to current and future business needs 1.3 Determine the number and type of NAS devices required, and refer to current and future network requirements 1.4 Determine the requirements for network management, backup, security and redundancy according to organisational policy
2. Select appropriate hardware and software	2.1 Select the hardware and operating system software version with the appropriate features according to required specifications 2.2 Choose storage applications to determine access and response times
3. Install hardware and software	3.1 Install required level of RAID hardware or software 3.2 Install hard disks as specified by manufacturer instructions 3.3 Install operating system software according to manufacturer instructions 3.4 Connect to network media using media that meets required standard 3.5 Connect power, power it up and check operation
4. Configure NAS	4.1 Configure a network address and hostname 4.2 Establish and test a valid network connection with other LAN devices 4.3 Configure hard disks according to RAID requirements and format with appropriate file system 4.4 Configure access and security according to application and organisational requirements
5. Test and troubleshoot NAS	5.1 Test NAS according to manufacturer requirements and organisational guidelines 5.2 Ensure access and response times are acceptable to required applications, users and organisational policy

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Make adjustments to the configuration, depending on test and troubleshooting results

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.4, 2.1, 3.2, 3.3, 4.4, 5.1, 5.2	• Recognises and interprets technical, manufacturer and organisational documentation to determine and confirm job requirements
Writing	1.1, 4.1	• Develops a range of workplace documentation for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	1.2, 1.3, 5.2	• Uses mathematical formulae to calculate required equipment, undertake measurements and determine response times
Navigate the world of work	1.4, 3.4, 5.1, 5.2	• Takes full responsibility for identifying and considering relevant organisational protocols and requirements
Get the work done	1.1-3, 2.1, 2.2, 3.1-3.5, 4.1-4.4, 5.2, 5.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Monitors outcomes of decisions, considering results and identifying key concepts and principles that may be adaptable in the future • Uses nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focussing attention and remedying problems as they arise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK524 Install and configure network access storage devices	ICANWK524A Install and configure network access storage devices	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK524 Install and configure network access storage devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the specifications for a network access storage (NAS)
- select the appropriate hardware and software requirements
- install a network access storage (NAS) device without interruption to other local area network (LAN) services
- configure LAN services accessing the NAS to allow user-less intervention for normal operation
- test and resolve configuration problems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the advantages and disadvantages of NAS versus direct attached storage (DAS) devices
- identify and summarise the legislative, regulatory, standards and codes of practice related to NAS
- Identify and describe common hard drive types and connectors
- identify and describe common network cable types and connectors
- outline the common network topologies
- describe the implementation and configuration of networks
- recognise and describe redundant array of independent disks (RAID) configurations and state their application in data storage.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a NAS device or basic components to build a NAS, such as personal computer, operating system, hard disk, and network connection
- network devices, such as switches and routers
- workstations and servers
- cabling access points and a wireless access point.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK525 Configure an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and implement virtualisation technologies, with the goal of providing a more sustainable information and communications technology (ICT) environment.

It applies to individuals working as senior networking staff responsible for increasing the sustainability of an organisation, by using virtualisation technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to configure the virtual environment	1.1 Obtain the technical specifications and system requirements from virtualisation software vendors 1.2 Review the environmental requirements for installing the virtualisation software
2. Install and configure the support services	2.1 Install and configure the required services and ports, according to virtualisation software vendors 2.2 Install and configure virtualisation client and server management software, according to the enterprise requirements 2.3 Install, configure and manage environmental requirements to ensure that virtual machines function 2.4 Configure virtual machines, using remote client management software
3. Design and configure the virtual network	3.1 Plan and design the virtual network, according to client needs 3.2 Install and configure the virtual networks 3.3 Verify the functionality of virtualisation network, according to the enterprise requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1, 3.3	• Recognises and interprets technical, manufacturer and organisational documentation, to determine and confirm job requirements
Writing	1.1, 1.2, 3.1	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Navigate the world of work	1.2, 2.2	• Takes full responsibility for identifying and considering the relevant organisational protocols and policies for designing, configuring and managing virtual networks in a virtual environment
Interact with Others	1.1, 3.1, 3.3	• Collaborates with others, sharing information to build strong work groups • Elicits feedback and provides feedback to others
Get the work done	1.1, 1.2, 1.3, 2.1-2.4	• Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, identifying and addressing any issues • Actively identifies systems, devices and applications with the potential to meet current and/or future needs • Responds intuitively to problems requiring immediate resolution, using understanding of the context to recognise anomalies and deviations from normal expectations, in a virtualised machine environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK525 Configure an enterprise virtual computing environment	ICANWK525B Configure an enterprise virtual computing environment	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK525 Configure an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- obtain the visualisation specifications from vendors, and compare them with the environmental requirements
- install, configure and test, virtual machines
- manage the environmental requirements
- install and use software tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and summarise, current government and industry policies, and guidelines, related to the development of sustainable information and communication technology (ICT) environments
- describe the current technologies, and processes, designed to produce a sustainable ICT environment
- outline the available tools and software applications required to manage virtual machines
- explain the configuration of software applications required to manage virtual machines
- explain the configuration required to integrate virtual machines into the existing network design
- outline the structure, function and business organisation of the client.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in networking, and include access to:

- a site or prototype where virtual machine environments may be implemented
- the network's technical requirements
- industry relevant virtualisation software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK527 Manage an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage virtualisation technologies, with the goal of providing a more sustainable information and communications technology (ICT) environment.

It applies to individuals with excellent communication skills responsible for managing virtualisation technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage resources	1.1 Monitor and adjust resources, to ensure virtual environment performance functions according to enterprise requirements 1.2 Verify the functionality of the virtual environment
2. Manage virtual machines	2.1 Use migration tools to convert a physical machine to a virtual machine 2.2 Select the appropriate deployment methods for a virtual machine 2.3 Create and deploy a virtual machine, using installation media 2.4 Create and deploy a virtual machine, using automated templates 2.5 Use virtual machine snapshots to reverse, or implement, changes to a virtual machine
3. Ensure high availability	3.1 Plan and design a strategy, to ensure high availability of the virtual environment 3.2 Identify and select suitable resources for high availability implementation, according to the enterprise requirements 3.3 Configure the virtual machine environment to ensure high availability 3.4 Configure the virtual machine environment to provide live migration 3.5 Plan and design a backup strategy 3.6 Back up, and recover, a virtual machine using and integrating third-party tools

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2	• Gathers, interprets and analyses technical and organisational data to determine requirements, according to client needs
Writing	1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.5	• Prepares documentation that expresses ideas and explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Oral Communication	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2	• Liaises with clients about operational requirements, using specific and relevant language • Uses listening and questioning techniques to confirm understanding
Navigate the world of work	1.1, 1.2	• Takes full responsibility for identifying and considering, the relevant policies and legislative requirements in the management of an enterprise's virtual computing environment
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.3, 3.4, 3.6	• Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world and understands the uses, and potential, of new technology • May operate from a broad conceptual plan, developing operational detail in stages and regularly reviewing priorities, and performance, during implementation, and identifying, and addressing any issues • Monitors the outcomes of decisions, considering the results from a range of perspectives, and identifying key concepts and principles that may be adaptable in the future • Uses a nuanced understanding of context to recognise anomalies and subtle deviations to normal expectations, focusing attention and quickly remedying any problems as they arise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK527 Manage an enterprise virtual computing environment	ICANWK527B Manage an enterprise virtual computing environment	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK527 Manage an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor and provide resources to a virtual environment
- create and deploy virtual machines
- implement changes to virtual machines
- back up and recover a virtual machine.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe, current government and industry policies, and guidelines, in relation to the development of sustainable information and communications technology (ICT) environments
- describe the current technologies, and processes, designed to produce a sustainable ICT environment
- define the structure, functions, and business organisation of the client
- summarise the application and deployment of virtual machine management tools
- outline virtual machine configuration and integration options.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype, where virtual machine environments may be implemented
- the network's technical requirements
- the appropriate software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK529 Install and manage complex ICT networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install and manage enterprise-wide information and communications technology (ICT) networks.

It applies to individuals with excellent ICT skills who are working as senior networking staff responsible for the sustainability of an organisation by using virtualisation technologies in complex computing environments of medium- to-large companies to provide network services and resources.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and design a complex network to meet business requirements	1.1 Review network design, business requirements and latest vendor technical specifications for network components 1.2 Research options available for providing the network functionality required 1.3 Plan network implementation to provide network services and resources to meet business requirements
2. Design and implement a security strategy	2.1 Analyse requirements for internal and external security 2.2 Design security strategy to meet requirements 2.3 Implement security strategy 2.4 Undertake ongoing monitoring of the viability and reliability of network security, through testing and use of technical tools 2.5 Continually monitor internal and external network access for security breaches
3. Install and configure a complex network to meet business requirements	3.1 Check and install cabling and associated components according to industry standards 3.2 Install and configure servers, routers, switches or other devices to provide internet protocol (IP) addressing and routing 3.3 Install and configure servers, routers, switches or other devices to provide name resolution 3.4 Install and configure servers, routers, switches or other devices to provide network services 3.5 Install and configure remote access services 3.6 Install and configure devices to provide data management services
4. Provide integrated network services across a complex network	4.1 Integrate multiple network services across network 4.2 Analyse and resolve interoperability issues 4.3 Optimise performance 4.4 Rectify security conflicts arising from integrating services
5. Plan, design and implement voice and video business	5.1 Install software and configure and test voice over internet protocol (VoIP) and videoconferencing services

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ELEMENT	PERFORMANCE CRITERIA
communications system	5.2 Incorporate the use of a communications server to provide real-time multimedia communications 5.3 Select common voice and videoconferencing codecs according to standards and practices
6. Manage and support a complex network	6.1 Identify and evaluate appropriate network management tools to assist in the administration of the complex network 6.2 Select and install network management tools according to industry and organisational standards 6.3 Set and monitor alerts and logs 6.4 Capture and analyse network performance data 6.5 Implement automated server updates 6.6 Implement desktop management policies 6.7 Implement automated virus checking 6.8 Use remote management tools
7. Test network functionality and obtain sign-off	7.1 Test network functionality and record results 7.2 Record results of network functionality test 7.3 Complete network documentation according to organisational standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 6.6	• Recognises and interprets technical and organisational documentation to determine and confirm job requirements
Writing	2.2, 7.1-7.3	• Develops a broad range of material, including recording test results for a specific audience using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	2.1	• Uses listening and questioning skills to confirm understanding for requirements, and participates in a verbal exchange of ideas/solutions
Numeracy	6.4	• Interprets numerical data when taking measurements and evaluating the performance and interoperability of network services
Navigate the world of work	3.1, 5.3, 6.2, 7.3	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations
Get the work done	1.1, 1.3, 2.3-2.5, 3.1-3.6, 4.1-4.4, 5.1-5.3, 6.1-6.8, 7.1	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Actively identifies, creates and utilises linkages to enhance knowledge sharing, idea creation, individual and collective engagement, and work outcomes • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and

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		addressing issues • Uses nuanced understanding of context to recognise anomalies in a network environment and subtle deviations to normal expectations, focussing attention and remedying problems as they arise

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK529 Install and manage complex ICT networks	ICANWK529A Install and manage complex ICT networks	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK529 Install and manage complex ICT networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and implement a complex network that involves integrating multiple network services to meet business requirements
- design and implement an appropriate security strategy for a complex network
- monitor and test the performance of aspects of the solution
- provide ongoing management and support of the network.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe firewall configurations and their application
- summarise internet protocol (IP) addressing and network configuration
- summarise and apply the following aspects of a network:
  - infrastructure
  - load balancing for applications
  - security
  - server operating systems
  - service configuration, including:
    - domain name system (DNS)
    - dynamic host configuration protocol (DHCP)
    - file transfer protocol (FTP)
    - network time protocol (NTP)
    - server messages block (SMB)
  - mail
  - proxy
  - web
  - service management
- identify and describe troubleshooting tools and techniques, including network diagnostic utilities
- outline the purpose of user authentication and directory services
- describe voice over internet protocol (VoIP)
- describe virtual private network (VPN).

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- network design and business requirements documents
- a complex network or hardware and software required to build a network involving multiple servers, multiple physical locations (or simulation of) and a combination of network services.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK531 Configure an internet gateway

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to connect network hardware devices, mainly personal computers (PCs), to an internet gateway.

It applies to individuals who are middle managers, network engineers, technical specialists or security analysts with excellent information communications and technology (ICT) skills who plan and implement networks, determine security threats and are involved in business budgeting.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements and network equipment	1.1 Confirm and validate client requirements 1.2 Determine scope of internet services with reference to client requirements 1.3 Identify and install both hardware and software components 1.4 Verify equipment specifications and availability of components
2. Review security issues	2.1 Assess security features of internet gateways with reference to architecture and security plan 2.2 Review security measures with the internet service provider (ISP) with reference to firewalls and other measures as required 2.3 Brief users on the security plan with reference to internet use and hazard possibilities
3. Install and configure gateway products and equipment	3.1 Identify and select installation and configuration options 3.2 Install and configure gateway products and equipment as required by technical guidelines 3.3 Plan and execute tests with reference to client requirements and network impact 3.4 Analyse error reports and make changes as required
4. Configure and test node	4.1 Assign node to specific gateway as required by network architecture and client requirements 4.2 Determine connection type and configure with reference to network architecture and client requirements 4.3 Ensure node software and hardware are configured as required according to vendor specifications and client requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.4, 2.1, 3.2-3.4, 4.1-4.3	• Recognises and interprets technical documentation, equipment manuals and specifications to determine and confirm job requirements
Oral Communication	1.1, 1.2, 2.2, 2.3, 3.3, 4.1-4.3	• Uses highly developed listening, observational and questioning skills to understand others' perspectives and clarify, explore and extend meaning • Establishes and maintains complex and effective spoken communication to convey and clarify a range of complex information to relevant personnel
Navigate the world of work	2.3, 3.2	• Monitors adherence to legal and regulatory rights and responsibilities for self and possibly others
Get the work done	1.2-1.4, 2.1, 2.2, 3.1-3.3, 4.1-4.3	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Uses nuanced understanding of context to recognise anomalies in a network environment and subtle deviations to normal expectations, focussing attention and solving problems as they arise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK531 Configure an internet gateway	ICANWK531A Configure an internet gateway	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK531 Configure an internet gateway

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine client requirements and network specifications
- determine security measures and brief users
- connect network hardware devices to an internet gateway
- configure and test gateway products
- configure and test node according to vendor specifications and client requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe current browser software
- explain domain name server (DNS) resolution
- outline the features and functions of:
  - network architecture
  - bridges as required
  - desktop operating systems
  - hubs
  - network gateways
  - network operating systems:
  - routers
  - switches
- describe the security issues that may impact on an internet gateway
- describe common security solutions and strategies
- identify and describe the principle function of current gateway software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a network and internet where gateway products may be installed and configured
- use of hardware and software currently used in industry
- client requirements documentation
- vendor specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK532 Identify and resolve network problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to troubleshoot local area network (LAN), wide area network (WAN) and wireless network problems.

It applies to individuals such as network managers, network engineers and technical specialists who generally work independently with limited supervision. Staff at this level perform a broad range of problem-solving activities, including troubleshooting, evaluating and analysing networks, and planning and developing new systems and procedures.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement regular network monitoring	1.1 Set up appropriate logs to monitor network activity and to produce a management information base (MIB) 1.2 Use network tools to benchmark the network and to establish a reference point for network performance 1.3 Identify critical activity levels and network capacity 1.4 Regularly review documents and logs to facilitate network tuning 1.5 Make recommendations to management for additional network resources to improve performance or to proactively avoid problems
2. Troubleshoot network problems	2.1 Communicate with help desk and other support services to quickly identify network problems 2.2 Use various tools and knowledge of network topology and protocols to identify network problems 2.3 Consult with vendor or service suppliers for assistance where appropriate
3. Diagnose network faults	3.1 Establish likely fault hierarchy using data from previous resolution attempts 3.2 Progressively isolate fault with concurrent testing of fault presence 3.3 Document steps taken to resolve fault 3.4 Refer fault to a higher level if not resolved within organisational limits
4. Rectify faults	4.1 Isolate and repair, replace and reconfigure equipment or software 4.2 Test network to ensure fault rectification 4.3 Advise users and clients of progress and solutions in a timely manner 4.4 Complete support documentation
5. Finalise fault rectification process	5.1 Review resolution of fault for possible reoccurrence, planned maintenance or upgrade requirements

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ELEMENT	PERFORMANCE CRITERIA
	5.2 Report to client with fault resolution and recommendations 5.3 Obtain sign-off from the appropriate person for work and billing outside of warranty or service level agreements 5.4 Forward necessary documentation to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.4, 3.1	• Recognises and interprets technical material, equipment manuals and other specifications to determine and confirm job requirements
Writing	1.5, 2.1, 2.3, 3.3, 4.3, 4.4, 5.2	• Develops a broad range of material such as reports and test documentation for a specific audience, using clear and detailed language to convey explicit information
Oral Communication	1.5, 2.1, 2.3, 4.3, 5.2	• Uses highly developed listening, observational and questioning skills to understand others' perspectives and clarify, explore and extend meaning • Establishes and maintains complex and effective spoken communication to convey and clarify a range of complex information to relevant personnel
Numeracy	1.5	• Performs mathematical calculations to analyse costs and values to accurately determine performance
Interact with others	5.3, 5.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Get the work done	1.1-1.3, 2.2, 3.1, 3.2, 3.4, 4.1, 4.2, 5.1,	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Uses nuanced understanding of context to recognise anomalies in a network environment and subtle deviations to normal expectations, focussing attention and solving problems as they arise • May identify a need for further information or seek advice from relevant experts

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK532 Identify and resolve network problems	ICANWK532A Identify and resolve network problems	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK532 Identify and resolve network problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a management information base
- benchmark the network performance
- troubleshoot and rectify network problems
- provide constant monitoring and tuning of the network
- review fault resolution and make recommendations.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain current industry accepted hardware, cabling and software products, including general features and capabilities
- summarise organisational maintenance response-level escalation procedures
- outline the client business domain, including client organisation structure and business functionality
- summarise network management tools, including the general features and capabilities, with substantial depth in troubleshooting areas
- outline network topologies
- summarise networking technologies, their features and capabilities, including those relating to:
  - protocol stacks of transmission control protocol or internet protocol (TCP/IP)
  - open system interconnection (OSI)
- identify and summarise the importance of the key organisations that oversee internet protocols
- identify and describe network protocols.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a live system and sites with a representative range of network environments and operating systems
- technical records and documentation
- management information base of accumulated fault resolution information
- network support tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK533 Configure and manage advanced virtual computing environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to configure and manage, advanced virtual computing environments to provide a more efficient and reliable information and communications technology (ICT) environment.

It applies to senior networking staff responsible for increasing the sustainability of an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Configure and manage core virtual networks	1.1 Plan and design the virtual network, according to enterprise requirements 1.2 Configure virtual local area networks (VLANs) and security, and virtual switch (vSwitch) ports 1.3 Implement security policies, traffic-shaping and network interface controller (NIC) teaming 1.4 Manage distributed vSwitch connections, vSwitch physical and vSwitch storage adapter connections 1.5 Configure and manage multiple networks
2. Configure and manage core infrastructure storage and services	2.1 Obtain the technical storage specifications and system requirements, from the virtualisation software vendors 2.2 Plan and design, the core infrastructure storage environment 2.3 Create, configure and secure the virtual storage connection 2.4 Manage and secure the virtual storage connection 2.5 Install and manage the local and shared data store, including the data store clusters and resource pools 2.6 Configure and manage provisioning services and templates
3. Secure virtual environment	3.1 Plan and design the administrative strategies 3.2 Configure the user roles to administer the virtual environment 3.3 Set up user privileges and permissions, according to the enterprise environment

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1	• Draws on a broad range of strategies, in order to build and maintain understanding throughout complex texts
Writing	1.1, 2.2, 3.1	• Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately
Navigate the world of work	1.1, 1.3, 3.3	• Modifies or develops organisational policies and procedures, to comply with legislative requirements and the organisation's goals
Get the work done	All	• Monitors the progress of plans and schedules, and reviews, and changes them, to meet new demands and priorities • Makes critical decisions quickly and intuitively in complex situations, taking into consideration a range of variables, including outcomes of previous decisions • Investigates new and innovative ideas as a means by which to continuously improve work practices and processes through consultation, formal and analytical thinking • Applies systematic and analytical decision- making processes for complex and non-routine situations • Uses and investigates, new digital technologies and applications to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK533 Configure and manage advanced virtual computing environments	ICANWK533A Configure and manage advanced virtual computing environments	Updated to meet Standards for Training Packages.	Equivalent unit

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Assessment Requirements for ICTNWK533 Configure and manage advanced virtual computing environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and design a virtual network, using the available advanced technologies
- configure the virtual network's security and storage requirements
- manage and administer the virtual network at an advanced level.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- define current government and industry policies, and guidelines, relating to the development of efficient and reliable, information and communications technology (ICT) environments
- determine the current technologies, and processes, designed to produce an efficient and reliable ICT environment
- describe the structure, functions, and business organisation of the client
- identify the benefits and costs of virtualisation
- summarise the procedures and processes for planning, designing and securing virtual environments
- specify the design, and configuration, of the available tools and software applications required to manage virtual machines
- specify the configuration required to integrate virtual machines into the existing network design
- describe the configuration and management of the storage infrastructure.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype, where virtual machine environments may be implemented
- the network's technical requirements
- a range of suitable software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK534 Monitor and troubleshoot virtual computing environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and troubleshoot, virtualisation technologies to provide a more efficient and reliable information and communications technology (ICT) environment.

It applies to senior networking staff responsible for increasing the sustainability of an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan the strategies to monitor and troubleshoot the performance of the enterprise's virtual computing environment	1.1 Develop a plan to monitor the virtual environment to ensure its availability and optimal performance, according to the enterprise requirements 1.2 Identify the virtual environment's critical activity level, and assign resources as needed 1.3 Review the system's logs and alerts, in order to facilitate virtual environment tuning
2. Manage virtual environment performance to ensure full resource optimisation	2.1 Monitor and diagnose the memory central processing unit (CPU) and distributed power management performance 2.2 Review the storage and cluster performance, in order to maximise operational efficiency 2.3 Monitor tasks, events and alarms, and network activity, and make relevant adjustments to ensure optimal operation
3. Analyse and troubleshoot the virtual environments	3.1 Review virtual machine capacity, application, storage, input and output (I/O) performance, to identify and resolve any performance issues 3.2 Test, analyse and troubleshoot, identified virtual network problems 3.3 Analyse and troubleshoot, high availability to ensure that the virtual machines are running at optimal performance levels 3.4 Consult with the virtualisation software vendors to provide solutions, where required
4. Diagnose virtual environment faults and provide solutions	4.1 Use virtualisation client and server management software tools, to help diagnose any virtual environment problems 4.2 Install and configure external virtualisation management tools, to help diagnose any virtual environment problems 4.3 Use system logs and alerts to collect and analyse errors 4.4 Evaluate problems using log files and alerts

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 2.2, 3.1, 3.3, 4.3, 4.4	• Critically analyses documentation from a variety of sources and records, and consolidates information, to determine requirements
Writing	1.1	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy, and the consistency of information
Oral Communication	3.4	• Presents complex information in formal situations, using clear and convincing language, and the tone and pace appropriate for the audience and purpose
Get the work done	1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Monitors the progress of plans and schedules, and reviews and changes them, to meet new demands and priorities • Applies systematic and analytical decision-making processes for complex and non-routine situations • Investigates new and innovative ideas, as a means by which to continuously improve work practices and processes, through consultation, formal and analytical thinking

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK534 Monitor and troubleshoot virtual computing environments	ICANWK534A Monitor and troubleshoot virtual computing environments	Updated to meet Standards for Training Packages.	Equivalent unit

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Assessment Requirements for ICTNWK534 Monitor and troubleshoot virtual computing environments

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor the enterprise's virtual computing environment, using the correct management tools
- configure the enterprise's virtual computing environment to operate at an optimal performance level
- troubleshoot problems in the virtual computing environment, using the relevant management tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and review, current government and industry policies, and guidelines, relating to the development of efficient and reliable, information and communications technology (ICT) environments
- define the current technologies, and processes, designed to produce an efficient and reliable ICT environment
- specify the structure, functions and business organisation of the client
- identify and apply, the available tools and software applications required to manage virtual machines
- specify the configuration of software applications required to manage virtual machines
- specify the configuration required to integrate virtual machines, into an existing network design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site or prototype, where virtual machine environments may be implemented
- the network's technical requirements
- a range of suitable software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK535 Install an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and implement, virtualisation technologies to provide a more efficient and reliable information and communications technology (ICT) environment.

It applies to senior networking staff responsible for increasing the sustainability of an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse client needs	1.1 Assess the client requirements 1.2 Assess the existing client or server systems that may be suitable to be virtualised
2. Analyse the virtualisation host software	2.1 Assess and compare suitable virtualisation host software, according to the enterprise requirements 2.2 Document the recommendations and provide these to the appropriate person
3. Evaluate the system requirements	3.1 Obtain and document the technical specifications, licensing and system requirements from the virtualisation software vendors 3.2 Evaluate, and compare, the system requirements needed to implement virtualisation 3.3 Document the recommendations and provide to the appropriate person
4. Plan and install the virtualisation host software	4.1 Plan and prepare, for the host software installation 4.2 Obtain and install the virtualisation host platform 4.3 Test and validate the functionality of the virtualisation host platform, according to the enterprise requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1, 3.2	• Critically analyses documentation from a variety of sources and records, and consolidates information, in order to determine requirements
Writing	2.2, 3.1, 3.3	• Prepares and produces dynamic material for a specific audience, using clear and detailed language in order to convey explicit information, requirements and recommendations
Oral Communication	1.1, 2.2, 3.1, 3.3	• Uses collaborative and inclusive techniques, including active listening and questioning, and the reading of verbal and non-verbal signals to convey and clarify information, and to confirm understanding
Navigate the world of work	2.1, 4.3	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies the organisational implications of new legislation or regulation • Identifies and resolves key business issues, processes, and practices that may have legal implications
Interact with others	1.1, 2.2, 3.1, 3.3	• Elicits feedback and provides feedback to others, in order to improve self or workgroup behaviours • Recognises the diversity in people, and manages this diversity to improve workplace relations and practices
Get the work done	1.1, 1.2, 3.2, 4.1, 4.2, 4.3	• Monitors the progress of plans and schedules, and reviews and changes them, to meet new demands and priorities • Makes critical decisions quickly and intuitively in complex situations, taking into consideration a range of variables, including the outcomes of previous decisions • Applies systematic and analytical decision- making processes for complex and non-routine situations • Investigates new and innovative ideas, as a means by which to continuously improve, work practices and processes through consultation, formal and analytical thinking

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK535 Install an enterprise virtual computing environment	ICANWK535A Install an enterprise virtual computing environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK535 Install an enterprise virtual computing environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and apply, the suitable tools and software applications required to manage virtual machines
- configure the software applications to manage virtual machines
- integrate the virtual machines into the existing network design
- test and validate the virtualisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- determine current government and industry policies, and guidelines, relating to the development of efficient and reliable, information and communications technology (ICT) environments
- analyse the current technologies, and processes, designed to produce an efficient and reliable ICT environment
- research the current recommendations on sustainability options in ICT design
- discuss the benefits of virtualisation
- identify and apply, the processes and procedures for installing and configuring virtualisation software and virtual machines
- identify and apply, the processes and procedures for configuring virtual machines into network design
- determine the structure, functions and business organisation of the client
- identify and apply, the available tools and software applications required to manage virtual machines
- research the configuration of software applications required to manage virtual machines
- research the configuration required to integrate virtual machines into existing network design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- site or prototype, where virtual machine environments may be implemented
- the network's technical requirements
- industry relevant virtualisation software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK601 Design and implement a security system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use software tools, equipment and protocols to implement a security system.

It applies to individuals who plan and implement networks, are involved in business budgeting, and determine and resolve network security threats.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess the security threats facing network Infrastructure	1.1 Evaluate mitigation methods for network attacks and different types of malware 1.2 Propose a methodical concept of defending network architecture
2. Secure edge devices (routers)	2.1 Secure network routers using software tools 2.2 Secure administration access to routers using the router operating system (OS) 2.3 Secure router OS and its configuration file(s)
3. Implement authentication, authorisation and accounting (AAA) and secure access control system (ACS)	3.1 Evaluate and implement the functions and importance of authentication, authorisation and accounting 3.2 Configure the router using AAA 3.3 Analyse and compare the features of Terminal Access Controller Access-Control System Plus(TACACS+) and Remote Authentication Dial In User Service (RADIUS) AAA protocols for securing the network
4. Mitigate threats to routers and networks using access control lists (ACLs)	4.1 Assess the functionality of access control lists and document the caveats to be considered when building them 4.2 Configure and verify IP ACLs to mitigate threats and to prevent internet protocol (IP) address spoofing using tools
5. Implement secure network management and reporting	5.1 Configure secure shell (SSH) on routers to enable secure management 5.2 Configure routers to send log messages to a log server with tools
6. Mitigate common layer 2 attacks	6.1 Document how to prevent layer 2 attacks by configuring basic switch security and features 6.2 Configure switch to prevent layer 2 attacks
7. Implement the router OS firewall-feature set	7.1 Evaluate and compare the operational strategies and weaknesses of the different firewall technologies 7.2 Implement zone-based firewall to strategically secure group of interfaces
8. Implement the intrusion	8.1 Evaluate and compare network based versus host based

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ELEMENT	PERFORMANCE CRITERIA
detection and prevention system (IDPS) feature set in the router OS using secure device manager (SDM)	IDPS to identify malicious activity, log information, attempt to block/stop activity, and report activity 8.2 Determine IDPS technologies, attack responses and monitoring options 8.3 Configure the router OS IDPS operations using secure device manager to monitor network and system activities for malicious activity
9. Implement site-to-site virtual private networks (VPNs) using SDM	9.1 Assess the different methods used in cryptography 9.2 Evaluate internet key exchange (IKE) protocol functionality and phases to support authentication and define the binding blocks of IPSec and the security functions it provides 9.3 Configure and verify an IPSec site-to-site VPN with pre-shared key (PSK) authentication to provide a secure channel between the two parties

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Recognises and interprets technical documentation to determine and confirm job requirements
Writing	1.2, 4.1, 6.1, 8.1, 8.2,	• Develops a broad range of materials, such as reports, for a specific audience using clear and detailed language to convey explicit information
Oral Communication	8.2	• Establishes and maintains complex and effective spoken communication to convey and clarify a range of complex information
Numeracy	9.2	• Interprets numerical data when taking test measurements, interpreting results and evaluating performance and interoperability of the network
Interact with others	1.2, 8.1	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience, and monitors impact
Get the work done	1.1, 2.1-2.3, 3.1-3.3, 4.1, 4.2, 5.1, 5.2, 6.2, 7.1, 7.2, 8.1, 8.3, 9.1-9.3	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Actively identifies, creates and utilises linkages to enhance knowledge sharing, idea creation, individual and collective engagement and work outcomes • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and

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		addressing issues • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles that may be adaptable to future situations • Responds intuitively to problems requiring immediate resolution, using understanding of context to recognise anomalies and deviations from normal expectation in a network environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK601 Design and implement a security system	ICANWK601A Design and implement a security system	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK601 Design and implement a security system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate network security system threats and requirements
- mitigate attacks and configure firewalls
- design and implement network security systems
- implement a virtual private network (VPN) using security device management tool.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise access control lists, configuration and troubleshooting
- outline authentication protocols
- explain encryption techniques
- explain intrusion detection system (IDS) and intrusion prevention system (IPS)
- clarify internet protocol (IP) and networking models
- explain current wireless regulations, standards and certifications
- describe local area network (LAN) or wide area network (WAN) implementations
- summarise malicious attacks and prevention techniques
- outline network management tools
- explain network security prevention methods
- explain procedures to configure, verify and troubleshoot:
  - switch with virtual local area networks (VLANs) and inter-switching communications
  - router
- outline procedures to set up virtual private networks (VPNs)
- explain routing protocols
- explain threat and attack mitigation techniques
- outline the use of command line interface to configure and test network elements
- describe the common features of Terminal Access Controller Access-Control System Plus(TACACS+) and Remote Authentication Dial In User Service (RADIUS) authentication, authorisation and accounting (AAA) protocols.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where network security may be evaluated and tightened
- hardware and software
- organisational guidelines, procedures and policies
- computers
- LAN or WLAN internet work technologies (hardware and software)
- security technologies (hardware and software).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK602 Plan, configure and test advanced server-based security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement advanced server security using secure authentication and network services on a network server.

It applies to individuals working as information and communications technology (ICT) network specialists, ICT network engineers, network security specialists, network security planners and network security designers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan advanced network server security according to business needs	1.1 Consult with client and key stakeholders to identify security requirements in an advanced network server environment 1.2 Analyse and review existing client security documentation and predict network service vulnerabilities 1.3 Research network authentication and network service configuration options and implications to produce network security solutions 1.4 Ensure features and capabilities of network service security options meet the business needs 1.5 Produce or update server security design documentation to include new solutions 1.6 Obtain sign-off for the security design from the appropriate person
2. Prepare for Network server security implementation	2.1 Prepare for work in line with site-specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures 2.2 Identify safety hazards and implement risk control measures in consultation with appropriate personnel 2.3 Consult appropriate person to ensure the task is coordinated effectively with others involved at the worksite 2.4 Back up server before implementing configuration changes
3. Configure the advanced network server security according to design	3.1 Configure update services to provide automatic updates to ensure maximum security and reliability 3.2 Configure network authentication, authorisation and accounting services to log and prevent unauthorised access to the server 3.3 Configure basic service security and access control lists to limit access to authorised users, groups or networks 3.4 Implement encryption as required by the design 3.5 Configure advanced network service security options for services and remote access 3.6 Configure the operating system or third-party firewall to filter traffic in line with security requirements

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ELEMENT	PERFORMANCE CRITERIA
	3.7 Ensure security of server logs and log servers are appropriately implemented for system integrity 3.8 Implement backup and recovery methods to enable restoration capability in the event of a disaster
4. Monitor and test network server security	4.1 Test server to assess the effectiveness of network service security according to agreed design plan 4.2 Monitor server logs, network traffic and open ports to detect possible intrusions 4.3 Monitor important files to detect unauthorised modifications 4.4 Investigate and verify alleged violations of server or data security and privacy breaches 4.5 Recover from, report and document security breaches according to security policies and procedures 4.6 Evaluate monitored results and reports to implement and test improvement actions required to maintain the required level of network service security

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 3.6, 4.1, 4.3, 4.5, 4.6	• Recognises and interprets technical enterprise security procedures, policies, specifications, and vendor notifications to determine and confirm job requirements
Writing	1.5, 4.5	• Develops a broad range of material including security reports for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	1.1, 2.2, 2.3, 4.5	• Uses listening and questioning skills to confirm understanding for requirements • Articulates clearly, using specific and relevant language suitable to audience, and participates in verbal exchanges of ideas and solutions
Interact with others	1.6	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience
Navigate the world of work	2.1	• Keeps up to date on changes to legislation or regulations relevant to own rights and responsibilities, and considers implications of these when planning, negotiating and undertaking work
Get the work done	1.2, 1.4, 2.2, 2.4, 3.1-3.8, 4.1, 4.2, 4.4-4.6	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Uses nuanced understanding of context to detect,

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		investigate and recover from security breaches

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK602 Plan, configure and test advanced server-based security	ICANWK602A Plan, configure and test advanced server-based security	Updated to meet Standards for Training Packages.	Equivalent unit

Links

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Assessment Requirements for ICTNWK602 Plan, configure and test advanced server-based security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify network service security vulnerabilities and appropriate controls
- plan, design and configure a secure network authentication service
- secure a wide range of network services to ensure server and data security, including:
  - dynamic name system (DNS)
  - web and proxy
  - mail
  - file transfer protocol (FTP)
  - firewall
- implement cryptographic techniques
- monitor the server for security breaches.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain auditing and penetration testing techniques
- summarise best practice procedures for implementing backup and restore
- outline cryptographic techniques
- clarify the procedures for error and event logging and reporting
- explain intrusion detection and recovery procedures
- outline network service configuration, including:
  - DNS
  - dynamic host configuration protocol (DHCP)
  - web
  - mail
  - FTP
  - server messages block (SMB)
  - network time protocol (NTP)
  - proxy
- summarise network service security features, options and limitations
- outline network service vulnerabilities
- summarise operating system help and support utilities
- describe planning, configuration, monitoring and troubleshooting techniques
- outline security protection mechanisms
- summarise security threats and risks
- explain server firewall configuration
- explain server monitoring and troubleshooting tools and techniques, including network monitoring and diagnostic utilities
- summarise user authentication and directory services.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where server installation may be conducted
- relevant server specifications
- cabling
- networked (LAN) computers
- server diagnostic software
- switch
- client requirements
- WAN service point of presence
- workstations
- relevant regulatory documentation that impacts on installation activities.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK603 Plan, configure and test advanced internetwork routing solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge necessary to plan, configure and support advanced internet protocol (IP) addressing and routing when implementing scalable and secure routers connected to local area networks (LANs) and wide area networks (WANs). The unit also covers configuration of secure routing solutions to support branch offices and mobile workers.

It applies to individuals with advanced information and communications technology (ICT) skills who are working in a variety of roles, including network specialists, network engineers, network infrastructure engineers, senior network administrators, network and systems managers, ICT security specialists, security engineers, communications engineers and communications managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan, configure and test a complex network-routing protocol solution	1.1 Determine network resources required for implementing a complex distance-vector routing protocol solution, a multi-area link-state routing protocol solution and an exterior routing protocol solution on a network 1.2 Produce separate protocol implementation plans and verification plans for each routing solution 1.3 Configure and test the routing protocol solution 1.4 Document results of the routing protocol solution implementation and verification plans for each solution
2. Plan, configure and test an internet protocol version 6- (IPv6) based network solution	2.1 Determine network resources needed for implementing IPv6 on a network 2.2 Produce an implementation plan and a verification plan for an IPv6-based network solution 2.3 Configure IPv6 routing and IPv6 interoperation with IPv4 2.4 Verify and test the IPv6 solution and make amendments if necessary 2.5 Document results of IPv6 implementation and verification plans
3. Plan, configure and test an IPv4 or IPv6-based network redistribution solution	3.1 Produce an IPv4 or IPv6 redistribution implementation plan and verification plan, based on the outcomes of a network redistribution analysis 3.2 Configure and verify the redistribution solution for the network 3.3 Document results of redistribution, implementation and verification plans 3.4 Analyse the differences between implementing an IPv4 and an IPv6 redistribution solution
4. Plan, configure and test a layer 3 path control solution	4.1 Produce a layer 3 path control implementation plan and a verification plan based on the outcomes of a network redistribution analysis 4.2 Configure and verify layer 3 path control for the network 4.3 Implement basic teleworker and branch services 4.4 Evaluate and compare broadband technologies and VPN

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ELEMENT	PERFORMANCE CRITERIA
	technologies in terms of access and data transfer rate as solutions for secure broadband network

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Recognises and interprets complex technical information to determine and confirm job requirements
Writing	1.2, 1.4, 2.2, 2.5, 3.1, 3.3, 4.1	• Develops a broad range of material including operational, technical and project management documentation for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Get the work done	1.1, 1.3, 2.1, 2.3, 2.4, 3.1, 3.2, 3.4, 4.1-4.4	• Considers the strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and enhance or reduce risks • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan to identify functional, performance and management features associated with the operation of complex networks • Uses nuanced understanding of context to solve problems in complex and dynamic environments with demanding service levels

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK603 Plan, configure and test advanced internetwork routing solutions	ICANWK603A Plan, configure and test advanced internetwork routing solutions	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK603 Plan, configure and test advanced internetwork routing solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan, configure and support advanced routed network infrastructure
- use network tools
- plan and analyse redistribution solutions
- produce and configure layer 3 path control implementation plan
- provide solutions to static and dynamic routing issues together with optimisation strategies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain broadband technologies relevant to advanced internetworking routing solutions
- summarise business justifications for having integrated and unified enterprise networks
- outline emerging viable business and social technologies
- clarify external developments or factors that affect network design
- summarise IPv4 and IPv6 technologies and solutions
- outline maintenance and management tools and practices suitable for complex networks to achieve availability and resilience
- summarise network topologies
- explain regulations, standards and certifications relevant to advanced internetworking routing solutions
- explain risk management strategies and practices suitable for a complex network environment
- outline routing tables, protocols and operational processes
- summarise routing technologies for an enterprise environment
- summarise security for enterprise networks
- explain security standards and technologies for network environments
- outline the benefits of formal or structured approaches to network management
- summarise virtual private network (VPN) technologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where network installation may be conducted
- router hardware and software
- organisational guidelines
- computers
- local area network (LAN) and wide area network (WAN) systems.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK604 Plan and configure advanced internetwork switching solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, configure and support advanced enterprise switching. The unit also covers secure integration of virtual local area networks (VLANs), wireless local area networks (WLANs), voice and video into campus networks.

It applies to individuals with advanced information and communications technology (ICT) skills who are working in a variety of roles, including network specialists, network engineers, network infrastructure engineers, senior network administrators, network and systems managers, ICT security specialists, security engineers, communications engineers and communications managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan, configure and test a VLAN-based solution	1.1 Determine network resources required for implementing a VLAN-based solution for a given network design and requirements 1.2 Produce an implementation plan and a verification plan for the VLAN-based network solution 1.3 Configure and verify switch-to-switch connectivity, loop prevention and access ports for the VLAN-based solution using network tools 1.4 Document results of the VLAN implementation and verification plans
2. Plan, configure and test a secure layer 2 network solution and a switch-based layer 3 services solution	2.1 Determine network resources required for implementing a secure layer 2 network solution and a switch-based layer 3 solution against vulnerabilities with organisational security policies 2.2 Produce an implementation plan and a verification plan for each of the layer 2 and layer 3 network solution 2.3 Configure and verify a private VLAN and features for port security and general switch security for the layer 2 network solution, using network tools 2.4 Configure and verify routing interfaces and layer 3 security for the switch-based layer 3 network solution, using network tools 2.5 Document results of security implementation and verification plans for each of the layer 2 and the layer 3 network solution
3. Prepare infrastructure to support advanced services	3.1 Implement a wireless extension of a layer 2 solution 3.2 Implement a support solution for a voice over internet protocol (VoIP) and a video application
4. Plan, configure and test high-availability networks using multilayer switches solution	4.1 Determine network resources needed for implementing high-availability solution for a given network design and requirements 4.2 Produce an implementation plan and a verification plan for the high-availability network, using multilayer switches 4.3 Configure, verify and manage first hop redundancy

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ELEMENT	PERFORMANCE CRITERIA
	protocols (FHRP) 4.4 Implement switch supervisor redundancy and use network tools to verify the high-availability solution 4.5 Document results of high-availability implementation and verification plans

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 4.1	• Recognises and interprets complex technical design information to determine and confirm job requirements
Writing	1.2, 1.4, 2.2, 2.5, 4.1, 4.2, 4.5	• Develops a broad range of material, including operational, technical, procedural and project management documentation for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Navigate the world of work	2.1	• Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations
Interact with others	1.1, 2.1, 4.1	• Collaborates with others, sharing information • Elicits feedback and provides feedback to others in order to improve
Get the work done	1.1, 1.3, 2.1, 2.3, 2.4, 3.1, 3.2, 4.1, 4.3, 4.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan to identify functional, performance and management features associated with the operation of complex switched networks • Uses nuanced understanding of context to solve problems in complex and dynamic environments with demanding service levels

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK604 Plan and configure advanced internetwork switching solutions	ICANWK604A Plan and configure advanced internetwork switching solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTNWK604 Plan and configure advanced internetwork switching solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, configure and support advanced switched network infrastructure
- implement wireless extension solution with multi-layered (layer 3) switches
- prepare infrastructure to support advanced services
- use network tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the benefits of formal or structured approach to network management
- summarise business justifications for having integrated and unified enterprise networks
- outline current wireless regulations, standards and certifications
- clarify emerging viable business and social technologies
- explain external developments or factors that affect switched network design
- summarise maintenance and management tools and practices suitable for complex networks to achieve availability and resilience
- outline network topologies
- explain organisational policies for internetworking
- summarise risk management strategies and practices suitable for a complex switched network environment
- outline security for an enterprise-switched environment
- explain security standards and technologies for switched network environments
- summarise switching and routing technologies for an enterprise-switched environment.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- local area network (LAN) and wide area network (WAN) systems, including voice and video (hardware or software).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK605 Design and configure secure integrated wireless systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use appropriate tools, equipment, software and protocols to produce a verified radio frequency (RF) design plan for a wireless local area network (WLAN) and to design, configure and troubleshoot secure integrated wireless systems.

It applies to individuals with advanced information and communications technology (ICT) skills who are working as wireless network installers, wireless network support specialists and wireless network engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and conduct a site survey for setting up a wireless network	1.1 Assess client requirements to plan for selecting appropriate WLAN technology and network elements 1.2 Evaluate existing network infrastructure and produce a wireless network topology to determine upgrade or new installation requirements 1.3 Prepare basic RF deployment considerations related to site survey design of data or voice over WLAN applications 1.4 Produce a survey model, including deployment characteristics to meet client requirements 1.5 Produce a spectral analysis predictive layer 1 site survey verified by a physical site survey 1.6 Analyse the survey results produced with an RF network design for a secure wireless network 1.7 Conduct an RF field trial for final evaluation of network topology and network element placements
2. Prepare design specifications and plan for secure enterprise WLANs	2.1 Prepare for work according to relevant legislation, workplace health and safety (WHS), codes, regulations and standards 2.2 Produce design specifications and layout for wireless network, using spread spectrum technology for enhanced network security 2.3 Review design plans to ensure sound WLAN RF principles and compliance with wireless regulatory bodies, standards and certifications
3. Configure and test a controller-based WLAN	3.1 Produce a controller-based wireless architecture from a possible range of industry-based wireless network architectures 3.2 Configure and test a WLAN controller and access points, using controller-based AP discovery and association to enable roaming facilities 3.3 Configure the basics of a stand-alone access point 3.4 Configure and test client operating system WLAN configuration and install vendor specific software and utilities where applicable

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ELEMENT	PERFORMANCE CRITERIA
4. Configure and test WLAN security	4.1 Review the general framework of wireless security and security components for securing the WLAN 4.2 Configure and test identification assignments to network elements 4.3 Configure and test authentication methods, using different sources of authentication 4.4 Configure and test encryption methods to comply with network security policies
5. Conduct WLAN maintenance and troubleshooting	5.1 Evaluate WLAN troubleshooting methods for controllers, access points and client methodologies 5.2 Use networking tools to maintain and troubleshoot network 5.3 Transfer device configurations and operating system (OS), using maintenance tools and commands

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.6, 2.3, 4.4	• Recognises and interprets complex technical documentation to determine and confirm job requirements
Writing	1.1, 1.4, 1.5, 2.2	• Develops a broad range of materials, including design and technical specifications, for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	3.2, 3.4, 4.2-4.4	• Interprets numerical data and undertakes measurements to evaluate performance and interoperability of network
Navigate the world of work	2.1, 2.3, 4.4	• Monitors adherence to legal and regulatory rights and responsibilities for self and possibly others
Interact with others	1.1, 1.4	• Identifies and uses appropriate communication conventions and protocols when liaising with internal and external stakeholders on technical, operational and business-related matters
Get the work done	1.1-1.3, 1.5-1.7, 2.2, 3.1-3.4, 4.1-4.4, 5.1- 5.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, coordinating the process with others to identify functional, performance and management features associated with the operation of complex switched networks • Uses understanding of context to troubleshoot and debug WAN issues, adapt configuration procedures to network requirements and reconfigure, depending on differing operational contingencies, risk situations and

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		environments

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK605 Design and configure secure integrated wireless systems	ICANWK605A Design and configure secure integrated wireless systems	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK605 Design and configure secure integrated wireless systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and conduct a wireless local area network (WLAN) site survey
- produce design specifications and layout of wireless network
- configure and test a controller-based WLAN
- test wireless security configurations
- maintain a WLAN.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain authentication and encryption methods
- summarise configuration, verification and troubleshooting procedures regarding:
  - router-operation
  - routing virtual local area network (VLAN) switching
  - inter-switching communications
- outline configuration of WLAN securities
- clarify current wireless regulations, standards and certifications
- summarise internetwork operating system (IOS) and internet protocol (IP) networking models
- explain radio frequency (RF) and WLAN technology and network design
- outline RF propagation and implementation issues
- explain spread spectrum technologies
- summarise wireless network topologies and elements
- outline wireless networking protocols
- describe WLAN devices, their specification and use
- summarise WLAN radio frequencies characteristics and their measuring techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- stand-alone and lightweight WLAN controllers and access point (AP)
- hardware and software WLAN site survey tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK606 Implement voice applications over secure wireless networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use network tools, equipment, software and protocols to design and integrate voice over wireless local area network (VoWLAN) services into the wireless local area network (WLAN), and to implement into the wireless network quality of service (QoS), multi-protocol label switching (MPLS), and high bandwidth applications.

It applies to individuals with excellent information communications and technology (ICT) skills who are working as wireless help desk technicians, wireless network support specialists and wireless network engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Specify requirements for voice over wireless architecture	1.1 Analyse voice requirements for use over a wireless network 1.2 Specify wireless requirements for voice applications for design considerations 1.3 Verify network for voice readiness and suitability
2. Design the implementation of secure VoWLAN	2.1 Configure wireless client devices 2.2 Design and configure the WLAN for VoWLAN with security configurations 2.3 Design and configure infrastructure devices 2.4 Devise structured troubleshooting methodology for VoWLAN implementation
3. Design and implement QoS for wireless applications	3.1 Plan general design considerations for wired QoS 3.2 Design wireless QoS deployment schemes 3.3 Configure WLAN equipment for QoS
4. Design, implement and test multicast over wireless environment	4.1 Evaluate general multicast concepts 4.2 Analyse the implications for multicast in 802.11 4.3 Configure multicast requirements for a wireless network 4.4 Devise structured troubleshooting methodology for multicast in a WLAN environment
5. Plan and scope the wireless network for video and high-bandwidth applications	5.1 Design and implement QoS for latency-sensitive applications 5.2 Analyse the requirement for video applications over 802.11n WLAN 5.3 Calculate and predict bandwidth requirements for video applications over the wireless network 5.4 Analyse the impact of the WLAN interconnectivity for devices on QoS for devices or the wired side

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Recognises and interprets complex technical documentation to determine and confirm job requirements
Writing	1.2, 2.2-2.4, 3.2, 4.4, 5.1	• Develops a range of material, including design and technical specifications, for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	5.3	• Interprets numerical data and undertakes measurements to evaluate performance and interoperability of the network
Get the work done	1.1-1.3, 2.1- 2.4, 3.1-3.3, 4.1-4.4, 5.1, 5.2, 5.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • May operate from a broad conceptual plan, coordinating the process with others to identify functional, performance and management features associated with the operation of complex VoWLAN services • Uses nuanced understanding of context to troubleshoot and debug WLAN issues, adapt configuration procedures to network requirements and reconfigure depending on differing operational contingencies, risk situations and environments

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK606 Implement voice applications over secure wireless networks	ICANWK606A Implement voice applications over secure wireless networks	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK606 Implement voice applications over secure wireless networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and specify voice over wireless architecture requirements
- design and implement voice applications over wireless local area network (WLAN)
- implement a quality of service (QoS) for wireless applications
- use network tools to configure and test wireless infrastructure and applications
- plan and scope the wireless network bandwidth.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the configuration, verification and troubleshoot procedures required to undertake:
  - router operation and routing
  - virtual local area network (VLAN) switching and inter-switching communications
- summarise iDevice operating system (iOS) and internet protocol (IP) networking models
- outline video and high-bandwidth applications and requirements
- explain voice applications and protocols
- clarify voice over wireless local area network (VoWLAN) technologies
- describe the following aspects of wireless networks:
  - current regulations, standards and certifications
  - deployment schemes
  - network security technology
  - network topologies and elements
  - networking protocols
- summarise WLAN devices and their specification and use.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- stand-alone and lightweight WLAN controllers and AP
- hardware and software LAN/WLAN voice technologies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK607 Design and implement wireless network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to mitigate security threats to a wireless local area network (WLAN) by implementing security standards and policies.

It applies to individuals with advanced information and communications technology (ICT) skills who are working as wireless help desk support technicians, wireless network support specialists and wireless network engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan to implement wireless network security	1.1 Research and evaluate organisational and regulatory security policies that have been used to benchmark acceptable network security standards 1.2 Assess customer requirements and needs against regulatory security compliance and work health and safety (WHS) considerations 1.3 Produce a plan with security solution documentation for future growth and security needs
2. Design, implement and test guest access services	2.1 Analyse and select the appropriate architecture for guest access services 2.2 Produce a map and set up guest access accounts 2.3 Configure WLAN controller authorisation 2.4 Configure the anchor and internal controllers 2.5 Troubleshoot guest access issues
3. Design, implement and test the security of wireless client devices	3.1 Design and configure authentication of clients and management frame protection on clients and controllers 3.2 Configure access control servers for integration with wireless network 3.3 Configure client- and server-side digital certificate services 3.4 Troubleshoot secure wireless connectivity services
4. Design, implement and test the integration of wireless network with organisational network admission control systems	4.1 Analyse network admission control architectures to assess the feasibility of network integration 4.2 Analyse the high-level authentication process flow to ensure compatible integration 4.3 Configure and test the wireless controller for admission control 4.4 Troubleshoot integration issues of network with access control
5. Evaluate and plan secure wireless connectivity services	5.1 Configure the intrusion detection system (IDS) to monitor the network activities for malicious activities or policy violations 5.2 Analyse the report produced by the IDS to review

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ELEMENT	PERFORMANCE CRITERIA
	threat-mitigation strategies 5.3 Update security solution plan to mitigate wireless vulnerabilities to ensure network integrity
6. Manage the requirements to integrate the WLAN with advanced security platforms	6.1 Evaluate end-to-end security solutions and assess how they integrate with the planned wireless solutions 6.2 Analyse the firewall configuration requirements of WLANs to ensure compliance with organisational policies 6.3 Configure and test the WLAN controllers for wired and wireless intrusion prevention and detection system (IPDS) security protection

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 5.2, 6.2	• Recognises and interprets complex technical information to determine hardware requirements
Writing	1.3, 2.2, 5.3	• Develops a broad range of material including plans, maps and other documentation for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	4.2, 4.3, 5.2, 6.3	• Interprets numerical data and undertakes measurements to evaluate performance and interoperability of network
Navigate the world of work	1.1, 1.2, 6.2	• Understands own legal rights and responsibilities, and considers implications of these when planning and undertaking work
Get the work done	1.2, 2.1, 2.2-2.5, 3.1-3.4, 4.1-4.4, 5.1, 6.1- 6.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • Uses nuanced understanding of context to adapt configuration procedures to requirements of network, troubleshoot and debug WLAN issues and modify work depending on operational contingencies, risk situations and environments • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles that may be adaptable to future situations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK607 Design and implement wireless network security	ICANWK607A Design and implement wireless network security	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK607 Design and implement wireless network security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- conduct research and produce a security solutions plan
- evaluate, design and implement a wireless local area network (WLAN) site security plan
- evaluate end-to-end security solutions and assess their integration with the planned wireless solutions
- use network tools to test wireless controllers and intrusion prevention and detection system (IPDS) solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain configuration, verification and troubleshooting procedures to undertake:
  - router operation and routing
  - virtual local area network (VLAN) switching and inter-switching communications
- outline iDevice Operating System (iOS) and internet protocol (IP) networking models
- explain intrusion prevention system (IPS) and intrusion detection system (IDS) security protection
- outline threat mitigation strategies
- summarise the following aspects of wireless, including:
  - current regulations, standards and certifications
  - deployment schemes
  - network security technology
  - network topologies, architectures and elements
  - networking protocols
- summarise WLAN with reference to:
  - advanced security platforms
  - devices, their specification and use
  - radio frequency characteristics and their measuring techniques.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site or prototype where network installation may be conducted
- hardware and software
- organisational guidelines
- live network
- stand-alone and lightweight WLAN controllers and access points (AP)
- hardware and software WLAN site survey tools
- hardware and software IDS and IPS.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK608 Configure network devices for a secure network infrastructure

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use software tools, equipment and protocols to configure network devices in the design of the infrastructure of a secure network.

It applies to individuals with advanced information and communications technology (ICT) skills who adapt router and switch operating system capabilities to mitigate attacks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement layer 2 security	1.1 Configure using router operating system (OS) commands to mitigate layer 2 attacks 1.2 Implement identity-based networking services (IBNS) on switches to provide layer 2 security 1.3 Implement identity management using access control system (ACS) as the authentication server
2. Configure router OS intrusion prevention system (OS-IPS) to mitigate threats to network resources	2.1 Evaluate the advanced capabilities of router OS-IPS firewall feature set to include event action processing (EAP) for threats to network resources 2.2 Configure and verify IPS features to identify threats and dynamically block them from entering the network 2.3 Maintain, update and tune the IPS signatures 2.4 Configure and verify context-based access control (CBAC) and network address translation (NAT) to dynamically mitigate identified threats to the network 2.5 Configure and verify zone-based firewall (ZFW) to include advanced application inspections and uniform resource locator (URL) filtering for improved network security
3. Configure virtual private networks (VPNs) to provide secure connectivity for site-to-site and remote access communications	3.1 Analyse and evaluate internet protocol security (IPSec) and generic routing encapsulation (IPSec/GRE) features and functionality 3.2 Configure secure connectivity for site-to-site VPN using certificate authorities 3.3 Analyse dynamic multipoint VPN (DMVPN) features and capabilities 3.4 Configure and verify secure connectivity for site-to-site VPN operations 3.5 Provide highly secure network access with secure socket layer (SSL) VPN to deliver remote access connectivity features and benefits 3.6 Evaluate EasyVPN benefits and configure EasyVPN server with dynamic virtual tunnel interface (DVTI) to create a virtual access interface on the virtual tunnel interface 3.7 Configure and verify EasyVPN remote to establish a

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ELEMENT	PERFORMANCE CRITERIA
	site-to-site connection using both router and VPN software clients 3.8 Implement group-encrypted transport (GET) VPN features to simplify the provisioning and management of VPN
4. Implement network foundation protection (NFP)	4.1 Evaluate NFP features and functionality to provide infrastructure protection 4.2 Secure the management plane, the data plane and the control plane using OS features of the router

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 3.1, 3.3, 3.6, 4.1	• Organises, evaluates and critiques ideas and information from a range of complex texts • Draws on a broad range of strategies to build and maintain understanding throughout complex texts
Writing	1.1-1.3, 2.2-2.5, 3.2, 3.4, 3.6, 3.7	• Generates complex written texts, demonstrating control over a broad range of writing styles and purposes • Writes and edits computer code and technical data ensuring correct syntax and accuracy
Numeracy	2.2, 2.4, 2.5, 3.4, 3.7	• Selects from, and flexibly applies, a wide range of highly developed mathematical and problem solving strategies and techniques in a broad range of contexts
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 4.1, 4.2	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK608 Configure network devices for a secure network infrastructure	ICANWK608A Configure network devices for a secure network infrastructure	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK608 Configure network devices for a secure network infrastructure

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate network security system requirements
- design, implement and verify network security systems using layer 2 and layer 3 devices
- mitigate threats to network security
- configure virtual private networks (VPNs) for secure connectivity
- evaluate and implement network foundation protection (NFP).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain configuration, verification and troubleshooting procedures to undertake:
  - virtual local area network (VLAN) switching
  - inter-switching communications
- outline the key features of deployment schemes
- summarise setting up and securing firewalls
- explain iDevice operating system (iOS) and internet protocol (IP) networking models
- outline local area network (LAN) and wide area network (WAN) implementations
- explain network address translation (NAT) concepts and configuration
- outline network topologies, architectures and elements
- explain networking standards and protocols
- outline procedures for configuring, verifying and troubleshooting router operations and routing
- summarise secure connectivity and remote access communications
- explain security protocols, such as secure socket layer (SSL)
- clarify threat mitigation strategies
- outline tunnelling protocols
- summarise VPN technologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site or prototype where network security may be evaluated and tightened
- hardware and software
- organisational guidelines, procedures and policies
- computers
- hardware and software LAN and WLAN internetwork technologies
- hardware and software security technologies.

Assessors must satisfy NVR/AQTF assessor requirements

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK609 Configure and manage intrusion prevention system on network sensors

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use appropriate tools, equipment and software to implement an intrusion prevention system (IPS) on IPS sensors to mitigate network attacks.

It applies to individuals with advanced information and communications technology (ICT) skills who are working as certified IPS specialists, network security specialists and network security managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate the ways IPS sensors are used to mitigate network attacks	1.1 Evaluate system requirements of the network according to industry standards for inline operations 1.2 Compare inline to promiscuous mode sensor operations and evaluate how IPS protects network devices from attacks 1.3 Evaluate the evasive techniques used by hackers and determine ways IPS can defeat those techniques in the network 1.4 Evaluate the considerations necessary for selection, placement, and deployment of a network IPS, including using features of IPS signature
2. Select and install IPS sensors and configure essential system parameters	2.1 Install and initialise the sensor for configuration of sensor interfaces, interface pairs, virtual local area network (VLAN) pairs and VLAN groups 2.2 Configure management access to the sensor appliance and create user accounts to comply with different user roles 2.3 Set up sensor communications with external management and monitoring systems 2.4 Manage and monitor sensor operation using built-in tools 2.5 Upgrade and maintain IPS sensor parameters and licensing requirements to maintain network integrity 2.6 Plan the mitigation of specific network vulnerabilities and exploits
3. Tune IPS sensor advanced system parameters to optimise attack mitigation performance	3.1 Tune sensor signatures to provide optimal protection of the network 3.2 Create custom signatures and a meta signature to meet mitigation performance configurations for given test scenarios while disabling alert production for the component signatures 3.3 Configure gateway for passive operating system (OS) fingerprinting 3.4 Configure the external product interface to receive and process information from external security and management products to automatically enhance the sensor configuration information 3.5 Configure a virtual sensor and anomaly detection

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Monitor the IPS advanced features for optimal performance
4. Manage security and response of the IPS to network attacks	4.1 Monitor IPS events using network tools to determine appropriate response to network attacks 4.2 Use network management tools to assess and manage IPS effectiveness against security intrusion

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4	• Recognises and interprets complex technical and regulatory information to determine and confirm job requirements
Writing	2.2, 2.5, 3.3-3.5	• Demonstrates sophisticated writing skills by selecting appropriate conventions and stylistic devices to express precise meaning • Writes and edits complex computer code and technical data, ensuring correct syntax and accuracy
Numeracy	2.2-2.4, 3.6, 4.1	• Selects from, and flexibly applies, a wide range of highly developed mathematical and problem solving strategies and techniques in a broad range of contexts
Navigate the world of work	1.1, 2.5	• Understands own legal rights and responsibilities, and considers implications of these when planning and undertaking work
Interact with others	2.2, 2.3, 3.4,	• Develops and implements communications strategies with internal and external persons • Shares knowledge, information and experience openly as an integral part of the working relationship
Get the work done	1.1-1.4, 2.1-2.6, 3.1-3.6, 4.1, 4.2	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • Recognises that identified 'problems' can be surface indicators of deeper issues and routinely reframes problem definitions as part of the process of identifying a root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK609 Configure and manage intrusion prevention system on network sensors	ICANWK609A Configure and manage intrusion prevention system on network sensors	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK609 Configure and manage intrusion prevention system on network sensors

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate intrusion prevention system (IPS) requirements and configure IPS sensors
- tune up IPS sensors to optimise attack mitigation
- use network tools and network management tools to monitor and manage security sensor events
- upgrade and maintain IPS sensors.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain configuration, verification and troubleshooting procedures to undertake a switch and router operation and routing protocol
- outline deployment schemes
- summarise setting up and securing firewalls
- summarise internetwork operating system (IOS) and internet protocol (IP) networking models
- explain IP addressing and detailed understanding of the transmission control protocol (TCP) or IP stack
- outline IPS and intrusion detection system (IDS) strategies
- explain IPS sensor technologies and licensing requirements
- outline local area network or wide area network (LAN/WAN) implementations and design
- summarise network topologies, architectures and elements
- outline networking standards and protocols
- explain signatures and meta signatures
- explain threat mitigation strategies
- explain virtual local area network (VLAN) concepts and functionality
- outline virtual private network (VPN) technologies
- identify and describe legislation, regulations, standards and codes of practice relevant to network security.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site or prototype where network installation may be conducted
- relevant hardware and software
- organisational guidelines
- live network
- an IPS system and its sensors.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTNWK610 Design and build integrated VoIP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use appropriate tools, equipment, software and protocols to design and build an internet protocol (IP) based integrated voice network for small-to-medium enterprises.

It applies to individuals with advanced information and communications technology (ICT) skills who are working as voice over internet protocol (VoIP) network support specialists, VoIP network engineers and VoIP systems installers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan design concepts of a voice network for specified voice quality	1.1 Determine the design requirements of an IP-based voice network, including the choice of network elements 1.2 Evaluate the various applications of real-time protocols and of signalling protocols for an appropriate gateway 1.3 Design a site numbering plan, including digit manipulation and path selection process 1.4 Plan and assign calling privileges as required 1.5 Predict VoIP call flow and potential impact on voice quality considerations and network performance
2. Design, configure implement and test voice protocols and interoperation of VoIP communications network	2.1 Produce the design layout of the voice network according to the design requirements 2.2 Design and configure a gateway and a gatekeeper to using H.323 protocol suite for dial plan resolution and call admission control for the network 2.3 Configure and test the use of real-time protocols, call management protocols and gateway signalling protocol in the network design 2.4 Analyse the function and interoperation of gatekeepers within an IP communications network
3. Design, configure and test a VoIP IP-to-IP call system	3.1 Analyse the IP-to-IP gateway features and functionality requirements for a given network design requirement 3.2 Configure the gatekeeper to support an IP-to-IP gateway 3.3 Configure and test the IP-to-IP gateway to provide address hiding, protocol and media interworking, and call admission control implementations 3.4 Produce test results and evaluate against design requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.1, 3.4	• Recognises and interprets complex technical information to determine and adhere to design requirements
Writing	1.3, 2.1, 3.4	• Develops a broad range of material including test results, planning and design documentation for a specific audience using clear and detailed language in order to convey explicit information, requirements and recommendations
Numeracy	1.3, 1.5, 2.3, 3.3, 3.4	• Interprets numerical data in the planning phase and undertakes measurements to evaluate performance and interoperability of network
Get the work done	1.1, 1.2, 1.4, 1.5, 2.2-2.4, 3.1-3.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • May use formal analytical and lateral thinking techniques for identifying issues and generating and evaluating possible solutions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK610 Design and build integrated VoIP networks	ICANWK610A Design and build integrated VoIP networks	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK610 Design and build integrated VoIP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine requirements and produce a concepts design of a voice over internet protocol (VoIP) network
- produce a design layout
- configure and test voice gateways
- design site numbering plan, dial plans and priorities
- use networking and network management tools
- configure and test real-time protocols, call management protocols and gateway signalling protocol in the network elements
- implement voice systems and applications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain codecs and their protocols for use
- summarise configuration, verification and troubleshooting procedures to undertake basic router operation and routing switch with VLANs and inter-switching communications
- outline design considerations and deployment schemes
- explain gateway technologies
- summarise internetwork operating system (IOS) and internet protocol (IP) networking models
- outline procedures and techniques for implementing local area network/wide area network (LAN/WAN) topologies
- explain network topologies, architectures and elements
- identify and describe networking standards and protocols
- outline voice applications and protocols
- explain VoIP technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- stand-alone and lightweight wireless local area network (WLAN) controllers and access point (AP)
- hardware and software local area network LAN/WLAN voice technologies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK611 Configure call processing network elements for secure VoIP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use tools, equipment, software and protocols to install or upgrade call processing network elements for secure and reliable internet protocol (IP)-based communications networks.

It applies to individuals with advanced information communications technology (ICT) skills who are working as advanced voice over internet protocol (VoIP) network support specialists, VoIP network engineers and VoIP systems installers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan to implement enterprise IP communications	1.1 Produce design considerations for planning and implementing IP-based voice communications networks 1.2 Produce a solutions plan to meet business expectations 1.3 Select the required resources to effectively install or upgrade voice management servers 1.4 Perform, test and evaluate the installation or upgrade of voice call management software against the solutions plan
2. Plan, configure and test call processing network elements for a single-site deployment	2.1 Produce a topology of the voice network and plan the location of the call processing network elements to best support the business requirements 2.2 Install and test voice servers to support user requirements, third-party session initiation protocol (SIP) phones and lightweight directory access protocol (LDAP) integration 2.3 Install and configure local area network (LAN) switches to support IP phones 2.4 Configure and test voice gateways according to gateway requirements to allow for internal calls and external calls and provide voice features 2.5 Configure and test the integration of voice servers with other media systems 2.6 Test and evaluate final configuration against the design requirements
3. Manage security and privacy of IP voice network	3.1 Produce design and installation templates for bulk deployment across the enterprise 3.2 Research and implement the use of a network support model to manage the performance and security of the IP voice network 3.3 Design and conduct simple security deployment scenarios to test the integrity and security of the voice network

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.4, 2.4, 2.6, 3.2	• Recognises and interprets complex technical information to determine and adhere to design requirements
Writing	1.1, 1.2, 2.1, 3.1	• Develops a broad range of material, including planning documentation, design and installation templates for a specific audience using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	1.3, 1.4, 2.2, 2.4-2.6	• Interprets numerical data in planning phase and undertakes measurements to evaluate performance and interoperability of network • Uses mathematical formulas and calculations to estimate and plan resource requirements
Get the work done	1.1, 1.3, 1.4, 2.1-2.6, 3.2	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot and understand the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • May use formal analytical and lateral thinking techniques for identifying issues and generating and evaluating possible solutions

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTNWK611 Configure call processing network elements for secure VoIP networks	ICANWK611A Configure call processing network elements for secure VoIP networks	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK611 Configure call processing network elements for secure VoIP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce design plan and requirements of call processing network elements
- configure and test voice gateways and local area network (LAN) switches
- evaluate voice call manager server requirements and design voice call systems and applications
- implement voice systems and applications on voice call manager
- manage security of voice network.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise call processing network element technology
- outline codecs and their protocols for use
- explain configuration, verification and troubleshoot procedures to undertake:
  - basic router operation and routing
  - switch with virtual local area network (VLANs) and inter-switching communications
- summarise design considerations and deployment schemes
- explain interoperability of legacy private branch exchange (PBX) to internet protocol (IP) voice communications
- outline internetwork operating system (IOS) and IP networking and network support models
- summarise LAN and wide area network (WAN) implementations
- outline network topologies, architectures and elements
- summarise network, signalling and call management protocols
- outline networking standards and protocols
- summarise security deployment scenarios
- explain voice applications and protocols
- outline voice over internet protocol (VoIP) technologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- site where network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- stand-alone and lightweight WLAN controllers and access points (AP)
- hardware and software LAN/WLAN voice technologies.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, manage and implement troubleshooting and monitoring strategies to ensure reliability and performance on advanced integrated internet protocol (IP) networks.

It applies to individuals with advanced information and communications technology (ICT) skills who are working as advanced support engineers, network support specialists and ICT network engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan the strategies for troubleshooting and monitoring the performance of advanced integrated IP networks	1.1 Develop a plan to monitor and manage the IP network to optimise its performance and reliability 1.2 Plan the isolation of network segments for troubleshooting procedures 1.3 Plan the testing sequences and scenarios of network infrastructure 1.4 Select appropriate network testing and monitoring tools, and software application to suit the specific network troubleshooting and monitoring sequence
2. Manage and monitor troubleshooting strategies for complex enterprise networks	2.1 Manage and monitor strategies for network monitoring structure 2.2 Produce a routine internetwork operating system (IOS) device maintenance plan to include monitoring of routing protocols and router configurations 2.3 Isolate sub-optimal internetwork operations at the appropriate open systems interconnection (OSI) model layer 2.4 Produce a plan for troubleshooting and monitoring security issues related to IOS services for mission critical applications 2.5 Produce a plan for troubleshooting and monitoring internet protocol version 6 (IPv6) and version 4 (IPv4) interoperability
3. Implement test plans for advanced network solutions	3.1 Test switch-to-switch connectivity, access ports and loop prevention for the virtual local area network (VLAN) based solution 3.2 Test private VLANs 3.3 Test switch virtual interfaces (SVI) 3.4 Test switch support of advanced services 3.5 Troubleshoot switch configuration

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2-1.4, 2.2, 2.4, 2.5	• Organises, evaluates and critiques ideas and information from a range of complex texts
Writing	1.1, 2.2, 2.4, 2.5	• Develops a broad range of material, including troubleshooting plans for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	3.1-3.4	• Interprets numerical data when testing plans for advanced network solutions, including taking measurements to evaluate performance and interoperability of network
Get the work done	1.2-1.4, 2.1-2.5, 3.1-3.4	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to generate possible solutions depending on differing operational contingencies, risk situations and environments

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks	ICANWK612A Plan and manage troubleshooting advanced integrated IP networks	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and monitor internet protocol (IP) networks for performance and reliability
- evaluate, design and implement a troubleshooting structured plan
- use network testing and monitoring tools
- produce a maintenance plan for monitoring routing protocols and configurations
- implement tests of advanced network solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise advanced network solutions
- explain configuration, verification and troubleshoot procedures to undertake:
  - router operation and routing
  - virtual local area networks (VLANs) switching and inter-switching communications
- outline deployment schemes
- explain iDevice operating system (iOS) and IP networking models
- explain IOS services
- explain IP network topologies, architectures and elements
- identify and describe network testing and monitoring tools
- outline networking standards and protocols
- summarise threat mitigation strategies
- outline VLAN technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a site where complex network installation may be conducted
- hardware and software
- organisational guidelines
- computers
- local area network (LAN) and wide area network (WAN) systems, including voice and video hardware and software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK613 Develop plans to manage structured troubleshooting process of enterprise networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the maintenance of a complex integrated enterprise network to ensure availability and performance standard.

It applies to individuals with advanced information and communications technology (ICT) skills who are working in a wide range of roles including network specialists, network engineers, network infrastructure engineers, senior network administrators, network and systems managers, ICT security specialists, security engineers, communications engineers and communications managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan the strategies for structured troubleshooting and monitoring of enterprise networks	1.1 Develop strategies to monitor and manage an enterprise network to ensure availability and performance standard 1.2 Conduct equipment and skills audits as required 1.3 Evaluate the business value of service level agreements (SLAs), formal maintenance plans and monitoring procedures against best practices for maintenance and fault procedures 1.4 Assign functional responsibilities to stakeholders according to the maintenance plan 1.5 Select and use appropriate network fault management tools and monitor and improve network performance
2. Manage and monitor structured troubleshooting strategies for complex enterprise networks	2.1 Implement structured network maintenance management processes and procedures in line with enterprise design plans and policies for ensuring high network reliability 2.2 Undertake risk assessment evaluation and rank threats for minimal impact 2.3 Develop and implement disaster recovery strategies for reliable contingencies and business continuity in a complex routing environment 2.4 Measure and analyse performance against an agreed baseline
3. Conduct structured network troubleshooting strategies	3.1 Analyse and troubleshoot layer 2 and 3 switch configuration to ensure the availability and resilience of a switched environment 3.2 Implement effective control of broadcast and multicast traffic in a switched environment 3.3 Analyse and troubleshoot scalable network layer connectivity with routing data structures and routing functions 3.4 Analyse and troubleshoot enterprise intra and internetwork routing protocols, architectures and processes 3.5 Analyse and troubleshoot route redistribution operations in inter-autonomous system routing architectures and processes 3.6 Test and manage internet protocol version 6 (IPv6) and version 4 (IPv4) addressing schema and verify internal and external internet protocol (IP) address translation standards 3.7 Analyse and troubleshoot communication filtering

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ELEMENT	PERFORMANCE CRITERIA
	techniques, automated address allocation systems and IPv6 operational issues in the context of enterprise routing protocols 3.8 Analyse and troubleshoot wireless network configuration issues 3.9 Analyse and resolve network performance issues in an integrated voice or video network

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.4, 2.1	• Identifies, analyses and evaluates complex text to determine all technical, regulatory and business requirements
Writing	1.1, 2.2, 2.3	• Develops a broad range of operational material for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	1.4	• Initiates and contributes to a range of complex conversations about technical concepts and issues relevant to personnel, responding, clarifying, explaining and expanding on information as required
Numeracy	1.2, 1.3, 2.4	• Interprets numerical data when testing plans for advanced network solutions, including taking measurements to evaluate performance and interoperability of network
Navigate the world of work	2.1	• Recognises protocols and policies that must be respected and maintained
Get the work done	1.1, 1.3-1.5, 2.1-2.4, 3.1-3.9	• Recognises the critical importance of clarifying, focussing and aligning goals and expectations, and may use the process to build ownership of and broad commitment to achieving outcomes • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to generate possible solutions, depending on differing operational contingencies, risk situations and environments

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK613 Develop plans to manage structured troubleshooting process of enterprise networks	ICANWK613A Develop plans to manage structured troubleshooting process of enterprise networks	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK613 Develop plans to manage structured troubleshooting process of enterprise networks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse, document and troubleshoot a given complex network using industry methodologies and resources
- develop monitoring and management plans
- use networking and network fault management tools
- evaluate risk assessments and minimise threats on enterprise networks.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline benefits of a formal or structured approach to network management
- explain disaster recovery strategies
- summarise emerging viable business and social technologies
- outline enterprise network technologies, design plans and policies
- summarise enterprise network topologies, architectures and elements
- outline external developments or factors that affect network design
- explain internet protocol version 4 (IPv4) and internet protocol version 6 (IPv6) addressing configurations
- outline maintenance and fault procedures
- explain maintenance and management tools and practices suitable for complex networks
- outline networking standards and protocols
- summarise risk management strategies and practices suitable for a complex network environment
- clarify routing and routed protocols
- outline routing and switching technologies for an enterprise environment
- summarise security for enterprise networks
- outline security standards and technologies for network environments
- explain service level agreements (SLAs)
- describe the value and process of conducting a skills audit
- explain troubleshooting and threat mitigation strategies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- a location where the network configuration can be implemented
- routers and switches with appropriate operating systems
- computers
- suitable testing and analysis tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTNWK614 Manage ICT security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage data security, enterprise continuity, incidents, networks and telecommunications security, and system and application security.

It applies to individuals with managerial responsibility and advanced information and communications technology (ICT) skills who are working as experienced security technical specialists, security analysts and security consultants.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage enterprise security parameters	1.1 Determine and evaluate parameters that affect enterprise security to establish benchmark 1.2 Review security classification and data management policies and procedures for relevance, and update if required 1.3 Plan and coordinate an effective enterprise continuity of operations (COOP) program and organisational structure for critical business continuity 1.4 Develop a plan to address factors to manage the risks of the enterprise 1.5 Integrate and evaluate risk management concepts into operational activities with related contingency planning activities, using an enterprise COOP performance measurement program 1.6 Evaluate and assess security incidents to establish an effective incident management program for the enterprise 1.7 Manage the coordination between related security teams for effective incident management processes and procedures
2. Manage networks and telecommunications security	2.1 Develop a network security and telecommunications program in line with enterprise policy and security goals 2.2 Manage the necessary resources to integrate network security and telecommunications program activities with technical support, security administration and incident response activities in a secure network 2.3 Establish effective communications protocols between the network security and telecommunications team and related security teams to manage the risks 2.4 Establish a performance measurement program to evaluate the security effectiveness of the integrated network security and telecommunications network 2.5 Ensure enterprise compliance with applicable network-based documents, and that network-based audits and management reviews are conducted to implement process improvement
3. Implement and document enhancements	3.1 Implement appropriate changes and improvement actions as required, and evaluate effectiveness of enhancements

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ELEMENT	PERFORMANCE CRITERIA
	3.2 Produce and table documentation for audit tracking

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.5, 1.6, 2.1, 2.5	• Identifies, analyses and evaluates complex text to determine regulatory and business requirements
Writing	1.2, 1.4, 1.6, 2.1, 2.3, 2.4, 3.2	• Develops a broad range of operational material, including recommendations and reports for a specific audience, using clear and detailed language to convey explicit information, requirements and recommendations
Numeracy	2.2	• Uses mathematical formulas and calculations to estimate and plan project costs
Navigate the world of work	1.2, 2.3-2.5	• Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	1.7, 2.2-2.5, 3.1	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Influences and fosters a collaborative culture, facilitating a sense of commitment and workplace cohesion • Understands diversity and seeks to integrate diversity into the work context, for managing change, making decisions and achieving shared outcomes
Get the work done	1.3-1.6, 2.1- 2.5, 3.1	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understand the uses and potential of new technology • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to generate possible solutions, depending on differing operational contingencies, risk situations and environments • Monitors outcomes of decisions, considering results

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		from a range of perspectives and identifying key concepts and principles that may be adaptable to future situations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK614 Manage ICT security	ICANWK614A Manage IT security	Updated to meet Standards for Training Packages. Minor change to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTNWK614 Manage ICT security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- direct contingency planning, operations and programs to manage risk
- establish the information and communications technology (ICT) system and application security engineering program
- manage the necessary resources to establish and maintain an effective network security and telecommunications program
- specify policy and coordinate review.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain business and commercial issues related to the management of ICT security
- explain continuity of operations (COOP)
- clarify critical analysis in a management context
- outline management specifications and objectives
- describe different management styles and systems
- explain systems development life cycle (SDLC).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking industry, and include access to:

- ICT business specifications
- ICT security assurance specifications
- management related scenarios
- a security environment, including the threats to security that are, or are held to be, present in the environment
- information on the security environment, including:
  - laws or legislation
  - existing organisational security policies
  - organisational expertise
  - use of risk analysis tools and methodologies currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTNWK615 Design and configure desktop virtualisation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, and configure, the desktop virtualisation technologies needed to support an enterprise virtualisation business solution.

It applies to senior networking staff responsible for increasing the sustainability of an enterprise.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare the design specifications and plan to implement enterprise desktop environments	1.1 Research the available desktop virtualisation software vendors 1.2 Evaluate the desktop virtualisation environment 1.3 Analyse and compare, the features and components of desktop virtualisation environment 1.4 Identify the desktop-specific design objectives, requirements and limitations 1.5 Document the design infrastructure, according to the enterprise requirements 1.6 Plan implementation and deployment, using the recommended design
2. Implement and configure the desktop virtualisation infrastructure and services	2.1 Assess the desktop virtualisation software and analyse its relevance to the enterprise requirements 2.2 Install and configure the desktop virtualisation environment 2.3 Implement specific features and functions, in order to provide suitable solutions to identified problems 2.4 Implement and manage the testing process 2.5 Apply desktop virtualisation technologies, to an accepted industry standard
3. Implement the application virtualisation	3.1 Plan the implementation and deployment of the application virtualisation software 3.2 Configure and test the application virtualisation system's components 3.3 Maintain, update and tune, the system's components

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1	• Organises, evaluates and critiques ideas, and information, from a wide range of complex texts
Writing	1.5, 3.1	• Demonstrates sophisticated writing skills by selecting the appropriate conventions and stylistic devices, to express the precise meaning
Navigate the world of work	1.5, 2.1, 2.5	• Works autonomously, making high-level decisions to achieve, and improve, organisational goals • Develops and implements strategies that ensure that organisational policies, procedures and regulatory requirements are being met
Get the work done	1.2-1.4, 1.6, 2.2-2.5, 3.2, 3.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Makes high-impact decisions in a complex and diverse environment, using input from a range of sources • Identifies the key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision- making strategies, where appropriate • Uses digital technologies to manage business operations, and actively investigates new technologies for strategic and operational purposes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK615 Design and configure desktop virtualisation	ICANWK615A Design and configure desktop virtualisation	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTNWK615 Design and configure desktop virtualisation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, configure and manage the implementation of the virtualised enterprise desktop environment
- analyse and critically evaluate, the features and functions of the virtualised enterprise desktop environment
- plan, configure and maintain, the application virtualisation software.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research current government and industry policies, and guidelines, relating to the development of efficient and reliable, information and communications technology (ICT) environments
- research the current technologies and processes designed to produce an efficient and reliable ICT environment
- determine the structure, functions and business organisation of the client
- identify and apply, the available tools and software applications required to manage the virtual desktop environment
- formulate the configuration of software applications required to manage the virtual desktop environment
- formulate the configuration required to integrate virtual machines into the existing network design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- a site where industry-specific technologies may be used
- industry-specific technologies currently used in the industry
- documents detailing workplace health and safety (WHS) standards, environmental guidelines and enterprise requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTNWK616 Manage security, privacy and compliance of cloud service deployment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage cloud security controls, and privacy and legal compliance, when implementing cloud services for an enterprise.

It applies to those with managerial responsibility, such as experienced security technical specialists, security analysts and security consultants.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Networking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage enterprise cloud security controls	1.1 Identify the cloud security issues faced by different delivery and deployment models relevant to the enterprise 1.2 Determine the specific enterprise areas of security responsibility 1.3 Implement the most relevant security controls and measures, to protect identified areas of responsibility
2. Manage enterprise cloud privacy and compliance	2.1 Identify the relevant compliance regulations relating to data storage 2.2 Determine the most relevant business continuity and data recovery plans 2.3 Identify, secure and maintain, the relevant logs and audit trails 2.4 Investigate and review legal, privacy and contractual issues to ensure that they meet the enterprise policy
3. Review, implement and document cloud security, privacy and compliance enhancements	3.1 Implement the appropriate changes, and integrate them into the current enterprise's continuity of operation program (COOP) 3.2 Establish a performance measurement program, to evaluate the security effectiveness of implemented security controls 3.3 Provide relevant documentation as part of COOP, for audit tracking purposes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.3, 2.4	• Organises, evaluates and critiques ideas, and information, from a wide range of complex texts
Writing	2.3, 3.3	• Demonstrates sophisticated writing skills by selecting the appropriate conventions and stylistic devices, to express precise meaning
Navigate the world of work	1.1	• Works autonomously making high-level decisions to achieve, and improve, organisational goals • Develops and implements strategies, that ensure that organisational policies, procedures and regulatory requirements are being met
Get the work done	1.2, 1.3, 2.1-2.4, 3.1-3.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment, exposed to competing demands • Gathers and analyses data, and seeks feedback to improve plans and processes • Makes high-impact decisions in a complex and diverse environment, using input from a range of sources • Identifies the key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision- making strategies, where appropriate • Explores and incubates, new and innovative ideas, through unconstrained analysis and critical thinking, to develop and improve the organisation's goals

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTNWK616 Manage security, privacy and compliance of cloud service deployment	ICANWK616A Manage security, privacy and compliance of cloud service deployment	Updated to meet Standards for Training Packages.	Equivalent unit

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Assessment Requirements for ICTNWK616 Manage security, privacy and compliance of cloud service deployment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify, manage and implement cloud security controls, according to legal and privacy requirements
- integrate the cloud security plans into the enterprise's existing security plans
- develop an ongoing performance measurement and evaluation review process.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- review the business and commercial issues relating to the management of cloud security
- research the legislation, organisational and jurisdictional policy and procedures that may impact on management areas including:
  - cloud-related privacy issues
  - codes of ethics and conduct
  - equal employment opportunity, equity and diversity principles
  - financial management requirements
  - governance requirements
- determine management specifications and objectives
- identify the management tools and techniques suited to a range of complex project activities
- describe the organisational and political context
- evaluate the systems development life cycle (SDLC)
- determine the techniques for critical analysis in a management context.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the network industry, and include access to:

- the cloud information and communications technology (ICT) business specifications
- the cloud ICT security assurance specifications
- management-related scenarios
- a cloud-focused security environment, including threats to security that are, or are held to be, present in the environment
- information on the security environment, including:
  - laws or legislation
  - existing enterprise security policies
  - enterprise expertise
- risk analysis tools and methodologies currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG401 Support small scale ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to support the management of low risk, straightforward information and communications technology (ICT) projects within an organisation.

It applies to individuals who may work under supervision but have responsibility to ensure workflow is planned and completed in line with requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Support project commencement	1.1 Confirm business opportunity to ensure the project objectives are understood 1.2 Identify stakeholders and gather requirements 1.3 Prepare a project charter or project proposal and obtain agreement from project sponsor
2. Support project plan development	2.1 Break down the requirements to identify tasks and resources needed to complete the project plan 2.2 Compile a schedule of project tasks, including realistic timeframes and costs if required 2.3 Allocate task responsibilities to project team members 2.4 Agree on a process with the sponsor to manage risks or unexpected events that may arise and affect project objectives
3. Support project completion	3.1 Work with project team to ensure project activities meet timeframe, scope, cost and quality expectations 3.2 Monitor and control project risks and issues according to the agreed process 3.3 Verify that project deliverables meet project expectations and sign off as complete 3.4 Train users, if applicable
4. Support project closure	4.1 Prepare ICT support or maintenance documents if applicable 4.2 Obtain final project sign-off from sponsor and key stakeholders 4.3 Document lessons learned and close the project

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.3	• Interprets and analyses text to gather detailed information and confirm requirements
Writing	1.3, 2.2, 4.1, 4.3	• Produces texts of varying complexity using appropriate language and grammar in logical sequence to convey information effectively
Oral Communication	1.1, 1.3, 2.3, 2.4, 3.1, 3.3, 3.4, 4.2	• Listens and participates in oral exchanges to effectively identify and confirm requirements • Delivers presentation using appropriate and effective language to convey information
Numeracy	2.2	• Formulates numerical assumptions and performs mathematical calculations appropriate to the task
Navigate the world of work	4.2	• Follows protocols and meets expectations associated with own role when obtaining final sign-off
Interact with others	2.3, 3.1, 3.4	• Collaborates with others to achieve joint outcomes, allocating tasks to team members and working with them to complete tasks according to plan
Get the work done	1.1-1.3, 2.1-2.4, 3.2, 3.3	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Applies formal problem-solving processes when tackling unfamiliar problems, breaking complex issues into manageable parts and identifying and evaluating several options for action when managing risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG401 Support small scale ICT projects	ICAPMG401A Support small scale IT projects	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG401 Support small scale ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a project plan appropriate to the project objectives and the project proposal
- support the initiation, control and completion of a simple small-scale information and communications technology (ICT) project
- identify and apply requirements and expectations of a project according to the project plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the different project-management and planning methods and tools
- explain the characteristics of technical teams
- describe the different methods of communication and communication styles, including interviewing techniques
- explain the organisational values, policies and processes that may be relevant to the project
- describe the risks associated with small scale projects including:
  - cost
  - scope
  - timelines.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work, and include access to office equipment, materials and industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPMG501 Manage ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the initiation, implementation and completion of reasonably complex information and communications technology (ICT) projects incorporating scope, risk control and financial factors.

It applies to individuals who utilise a range of specialised technical and managerial techniques to plan, carry out and evaluate their own work and/or the work of a team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage project definition activities	1.1 Confirm organisational project governance policy and processes 1.2 Confirm business problem or opportunity and project objectives 1.3 Develop project charter, including preliminary statement of project scope and obtain sign-off 1.4 Conduct a feasibility study and prepare a business case as necessary
2. Undertake project planning	2.1 Plan information gathering activities to determine project requirements, constraints and risks 2.2 Identify project partitioning on the basis of intended system development life cycle and risk 2.3 Prepare project work breakdown, schedule and budget 2.4 Compile project management plan documents as necessary to communicate the intended management strategy for the project and obtain sign-off
3. Establish the IT project team	3.1 Identify and select team members, and allocate roles and responsibilities, based on project solution requirements 3.2 Determine training and support needs of team members 3.3 Establish project team values and agreed behavioural standards with team members
4. Manage project execution activities	4.1 Monitor delivery and acceptance of assigned project team work activities and manage individuals 4.2 Monitor and control the quality of project deliverables 4.3 Monitor and control project scope changes, risks and issues 4.4 Manage system testing and hand over activities
5. Coordinate project closure	5.1 Prepare IT support plans and maintenance or support documents 5.2 Obtain final project sign-off 5.3 Conduct post project review and document lessons learned 5.4 Review and update disaster recovery plan

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ELEMENT	PERFORMANCE CRITERIA
	5.5 Close project

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.2	• Interprets complex text in order to appropriately address the project requirements
Writing	1.3, 1.4, 2.3, 2.4, 3.3, 5.1, 5.2, 5.4	• Prepares complex documents using appropriate language and grammar, and presents ideas, options and recommendations in a logical sequence
Oral Communication	1.1-1.3, 2.4, 3.2, 3.3, 4.1, 5.2, 5.3	• Actively listens and contributes to discussions to confirm requirements or discuss solutions to identified problems • Conducts presentation to senior management and other team members, and effectively communicates ideas in a logical sequence
Numeracy	2.3	• Uses a wide range of mathematical calculations to interpret numerical information and to prepare/reconcile financial data
Navigate the world of work	2.4, 4.4, 5.2, 5.5	• Recognises and follows explicit and implicit protocols and meets expectations associated with own role
Interact with others	3.1, 3.2, 3.3	• Fosters a collaborative culture within own sphere of influence, facilitating a sense of commitment and cohesion, and highlighting and using the strengths of those involved when establishing the project team • Actively builds formal and informal networks to include key people/communities with expert skills and knowledge
Get the work done	1.1-1.4, 2.1-2.4, 4.1-4.4, 5.3, 5.4	• Makes a range of decisions in relatively complex situations, taking a range of constraints into account when monitoring the project and system testing • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria when conducting post project reviews

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG501 Manage ICT projects	ICAPMG501A Manage IT projects	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG501 Manage ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- scope the activities of a complex information and communications technology (ICT) project
- prepare a project plan
- determine the project team and duties
- execute a project
- close the project, ensuring it has met requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the characteristics of leaders and technical teams
- outline the consultation and communication techniques and strategies
- describe the process of establishing technical teams and determine stages of team development
- explain estimation and cost-analysis techniques
- describe the methods of communication and communication styles, including interviewing techniques
- identify the objectives and perform benefits analysis
- outline the organisational values, policies and processes that apply to the project
- conduct performance management and project team appraisal methods
- explain the processes for monitoring team and own performance
- outline the project cash flow and budgeting processes
- identify the range of project-management methods and tools
- conduct systems analysis and modelling techniques
- explain team roles and delegation within a multi-project methodology context
- identify and analyse technology solution models and frameworks.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work, and include access to office equipment, materials and industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPMG601 Establish ICT project governance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish an information and communications technology (ICT) project, with a governance framework within small, medium or large organisations.

It applies to individuals who may be required to use advanced project management skills in developing logical and sustainable IT project plans using organisational/established benchmarks and ethical practices.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish project governance framework	1.1 Assess current project methodology and determine state of project management maturity 1.2 Determine governance framework 1.3 Appoint project governance team 1.4 Establish project governance reporting processes
2. Establish project governance roles and responsibilities	2.1 Agree with project sponsor on responsibilities 2.2 Delegate steering committee or project board responsibilities 2.3 Confirm project manager responsibilities
3. Establish IT project stakeholder expectations	3.1 Educate stakeholders on characteristics of ICT projects 3.2 Develop and maintain project relationships 3.3 Negotiate successful project outcomes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets and analyses complex text in order to ascertain requirements
Writing	1.4, 2.3	• Develops documents that present ideas and directives in an acceptable sequence and in a precise manner
Oral Communication	1.1-1.3, 2.1-2.3, 3.1-3.3	• Determines requirements through active listening, use of open ended questioning and paraphrasing • Uses appropriate language and style to present complex or technical information and ideas appropriate to the audience • Facilitates successful discussions by comparing and building on ideas of others and ensuring a win-win outcome
Navigate the world of work	1.3, 1.4, 2.1-2.3	• Recognises and follows explicit and implicit protocols when establishing reporting processes, appointing team and establishing roles and responsibilities
Interact with others	2.2, 2.3, 3.2, 3.3	• Demonstrates understanding of what to communicate, with whom and how, when developing and maintaining project relationships, negotiating outcomes and educating stakeholders • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking a leadership role on occasion
Get the work done	All	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks, and identify and evaluate alternative strategies and resources • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG601 Establish ICT project governance	ICAPMG601A Establish IT project governance	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG601 Establish ICT project governance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assess the project environment
- establish or implement an information and communications technology (ICT) project management governance framework
- negotiate with stakeholders to agree achievable project objectives.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the organisation's industry
- outline the organisation's current information systems and processes
- explain organisational policies and procedures, including:
  - project management and procurement policies
  - environment
  - duty of care
  - contract
  - company
  - freedom of information
  - industrial relations
  - privacy and confidentiality
  - due diligence
  - records management
- explain project governance approaches and methods
- outline relevant legislation and regulations that impact on project governance.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work, and include access to office equipment, materials and industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG602 Manage ICT project initiation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to initiate an information and communications technology (ICT) project within small, medium or large organisations.

It applies to individuals who may be required to apply project management skills to establish the necessary foundation to facilitate successful delivery of agreed project outcomes.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define project	1.1 Define business problems and initial scope 1.2 Identify key stakeholders and analyse stakeholder needs 1.3 Define project constraints
2. Develop project business case and feasibility	2.1 Identify project objectives and benefits 2.2 Identify and select feasible ICT solutions 2.3 Develop and present the business case or feasibility study 2.4 Obtain appropriate sign-off
3. Select project approach	3.1 Identify project core technology areas 3.2 Identify solution approach requirements 3.3 Negotiate project outcomes
4. Establish the ICT project team	4.1 Identify and select team members 4.2 Establish team member roles and responsibilities 4.3 Develop a cohesive technical team 4.4 Train and support team members

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.1, 2.2, 3.1, 3.2	• Interprets and analyses complex textual data to ascertain requirements
Writing	1.1, 1.3, 2.3	• Prepares a well-structured and cohesive document presenting alternative views, evidence and recommendations utilising technical language and correct spelling and grammar
Oral Communication	1.1-1.3, 2.3, 2.4, 3.3, 4.4	• Determines requirements through active listening, use of open ended questioning and paraphrasing • Uses appropriate language and style to present complex or technical information and ideas appropriate to the audience • Facilitates successful discussions by comparing and building on ideas of others and ensuring a win-win outcome
Numeracy	2.3	• Tests the viability of data by completing estimates and cost comparisons using relevant mathematical calculations
Navigate the world of work	2.4	• Recognises and follows explicit and implicit protocols and meets expectations associated with own role
Interact with others	4.1-4.4	• Invests time and energy in building rapport with others as an integral part of all work based interactions • Plays a lead role in situations requiring effective collaboration, demonstrating high level influencing skills, focusing and shaping awareness, and engaging and motivating others • Shares knowledge, experience information and resources with others as an integral part of work relationships • Seeks to establish a climate in which it is possible to clarify and share the real needs and issues
Get the work done	1.1-1.3, 2.2, 3.1-3.3	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating

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		options against agreed criteria • May use formal analytical and lateral thinking techniques for identifying issues, generating and evaluating feasible ICT solutions • Considers the strategic and operational potential of digital trends when selecting ICT solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG602 Manage ICT project initiation	ICAPMG602A Manage IT project initiation	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPMG602 Manage ICT project initiation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a comprehensive business case information and communications technology (ICT) project implementation approach that takes into account core technology limitations and project constraints
- establish and work in a cohesive project team.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the characteristics of leadership and technical teams
- describe the consultation and communication techniques, styles and strategies, including interviewing techniques required when managing a project
- describe estimation and cost analysis techniques
- explain the process of establishing technical teams and determining stages of team development
- describe the process of setting objectives and conducting a benefits analysis
- identify the organisational values, policies and processes that are applicable to the project
- describe performance management and project team appraisal methods
- identify and describe the processes for monitoring team and own performance
- explain cash flow and how it is managed through budgeting
- describe a range of project management methods and tools, and how they apply in a formal project management methodology
- explain the proposed systems analysis and modelling techniques
- summarise the process of determining team roles, and describe the delegation process within a multi-project methodology context
- explain the proposed technology solution models and frameworks.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- an organisation's identified problem, opportunity or unfulfilled legislative need.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPMG603 Manage ICT project planning

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and manage an information and communications technology (ICT) project within small, medium or large organisations.

It applies to individuals who may be required to apply advanced project management skills in developing and documenting logical processes and timelines to ensure that projects are delivered in accordance with stakeholder expectations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish project control plans	1.1 Develop the project management plan 1.2 Develop management sub-plans
2. Determine appropriate methodology	2.1 Assess models of project management 2.2 Assess product development or procurement approach 2.3 Select appropriate project management and systems development methodology 2.4 Tailor methodologies to solution requirements
3. Develop project schedule	3.1 Develop project component breakdown 3.2 Estimate project effort and duration 3.3 Create project schedule 3.4 Develop and allocate work packages 3.5 Establish schedule controls
4. Finalise project budget	4.1 Identify areas of anticipated project spend 4.2 Determine dollar amounts and timing of cash flows 4.3 Develop a project budget 4.4 Establish budget controls

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2	• Interprets and analyses complex text to ascertain requirements
Writing	1.1, 1.2, 2.4, 3.1, 3.3-3.5	• Develops documents that present ideas in logical and precise sequence while establishing inter-relationships between project stages • Presents ideas in a manner that is prescriptive and eliminates ambiguity
Oral Communication	1.1, 1.2, 2.1, 2.2	• Determines requirements through active listening, use of open-ended questioning and paraphrasing • Uses appropriate language and style to present complex or technical information and ideas appropriate to the audience • Facilitates successful discussions by comparing and building on ideas of others and ensuring a win-win outcome
Numeracy	3.2, 4.2-4.4	• Uses sound mathematical assumptions and applies equations in developing cost-benefit analyses, budgets and cash flows
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communications • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • May invest time in developing and shaping several options before making a final choice, using a combination of lateral and analytical thinking to choose an idea to suit needs, resources and constraints

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG603 Manage ICT project planning	ICAPMG603A Manage IT project planning	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPMG603 Manage ICT project planning

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop an information and communications technology (ICT) project management plan
- select appropriate methodology
- develop project schedule
- develop a project budget
- establish budgetary controls.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline current and emerging industry practice in relation to:
  - estimation techniques and methods
  - planning techniques and methods
  - project management methodologies
  - system development methodologies
- explain the impact of business needs on project management, including implications for project control and expected returns on business investment.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- an organisation's identified problem, opportunity or unfulfilled legislative need.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG604 Manage ICT project delivery

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the creation and delivery of the products of an information and communications technology (ICT) project within small, medium or large organisations.

It applies to individuals who are required to manage teams and apply high-level project management, business and technical skills necessary to ensure that the project delivered is consistent with system requirements and agreed design.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage systems analysis and design	1.1 Apply systems thinking to project design 1.2 Model ICT process and systems according to specifications 1.3 Re-engineer business processes 1.4 Control ICT systems development 1.5 Review ICT architecture 1.6 Manage the design and integration of the system
2. Facilitate project-related workshops	2.1 Apply facilitation techniques 2.2 Apply problem-solving techniques 2.3 Facilitate requirements gathering 2.4 Facilitate ICT design workshops
3. Manage ICT project team performance	3.1 Establish a project team performance framework 3.2 Measure team member performance 3.3 Manage the technical staff performance 3.4 Manage project team dissolution
4. Manage the project delivery cycle	4.1 Delegate project work to project team members 4.2 Review and report status of project 4.3 Assess progress and update plans 4.4 Assess the quality of deliverables and rectify where required 4.5 Control project issues and take corrective action 4.6 Update project control documents

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.5, 2.3, 2.4, 4.2-4.5	• Interprets and analyses models, diagrams and specifications for appropriate inclusion into the project requirements, plans and methodologies
Writing	1.2, 2.3, 3.1, 4.1-4.3, 4.6	• Uses technically specific language in developing design solutions for communication to project-team members and technical staff • Articulates researched information and presents this in a clear, concise sequential and grammatically-correct manner, and in a writing style that is appropriate to the audience
Oral Communication	1.2, 1.6, 2.1, 2.3, 2.4, 3.1-3.4, 4.1-4.5	• Uses appropriate language and style when presenting complex ideas to all stakeholders to ensure that project requirements are understood • Facilitates successful discussions by employing effective listening, questioning and summarising skills to ensure that the audience fully understands the proceedings
Interact with others	2.1-2.4, 3.1-3.4, 4.1	• Shares knowledge, experience, information and resources with others as an integral part of work relationships when facilitating design workshops • Plays a lead role in situations requiring effective collaboration, demonstrating high-level influencing skills, focusing and shaping awareness, and engaging and motivating others
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • May use formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG604 Manage ICT project delivery	ICAPMG604A Manage IT project delivery	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPMG604 Manage ICT project delivery

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and design the system
- facilitate workshops for design development
- manage the project team performance
- manage the project delivery cycle.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the formal management methodology, including project management roles and responsibilities
- identify the problem-solving tools and techniques
- identify and describe information and communications technology (ICT) process models and their application
- explain the key requirements of ICT design
- outline the business processes applicable to the project.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- an organisation's identified problem, opportunity or unfulfilled legislative need.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG605 Manage ICT project closure

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to decommission or close an information and communications technology (ICT) project within a small, medium or large organisation.

It applies to individuals who may be required to use advanced project-management skills in undertaking a strategic assessment of the status of a project.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate project performance	1.1 Collect project performance metrics 1.2 Debrief project team 1.3 Debrief project stakeholders 1.4 Summarise and report on results
2. Finalise the project	2.1 Review project performance to determine whether the project should be continued, decommissioned or closed 2.2 Assess the impact of continuing, decommissioning or closing the project 2.3 Recommend appropriate management action to the relevant governing authority 2.4 Decommission or close the project if required
3. Action outstanding activities	3.1 Identify outstanding activities and create an action plan 3.2 Assign responsibilities to action outstanding activities 3.3 Follow up outstanding activities to ensure completion

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1, 2.2, 3.1	• Analyses complex textual data to ascertain completion of project components and identify issues and root causes to facilitate the formulation of the appropriate recommendation
Writing	1.4, 2.3, 3.2	• Presents information in a logical manner and clear of any ambiguities using technical language appropriate to the stakeholders • Uses the appropriate technical language when compiling reports based on verifiable data • Uses correct grammar, spelling and punctuation when presenting options and recommendations to allow for an appropriate decision to be generated/formulated
Oral Communication	1.1-1.4, 2.3, 2.4, 3.1-3.3	• Uses appropriate language and style when with parties of various levels to ensure that the information being delivered accurately represents project status based on available analytical data, and that it is understood by all stakeholders • Uses language that is appropriate when negotiating the best outcomes • Facilitates discussions using active listening, questioning and summarising when undertaking reviews, debrief sessions and presentations to ensure the efficient exchange of ideas
Numeracy	1.1, 2.2	• Analyses complex numerical information embedded in performance metrics
Get the work done	2.1-2.3, 3.1-3.3	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG605 Manage ICT project closure	ICAPMG605A Manage IT project closure	Updated to meet Standards for Training Packages. Minor edits to the competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG605 Manage ICT project closure

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review relevant project documentation, including project metrics
- analyse the project performance
- recommend and plan the decommissioning or closure of a complex information and communications technology (ICT) project.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify project stakeholders
- explain the problem-solving techniques to address issues related to project closure
- outline the project management methods, practices and processes
- identify and describe project performance metrics.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG606 Manage ICT project quality

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement quality assurance processes using quality control data to ensure continuous improvement for the benefit of current and future information and communications technology (ICT) projects.

It applies to individuals who may be required to apply high level business management, quality and technical knowledge and skills to ensure that projects are delivered, evaluated and monitored in accordance with organisational quality management systems and processes.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish a quality management plan	1.1 Determine project quality requirements with reference to project scope and stakeholder needs and expectations 1.2 Adopt or agree on organisational quality policy and quality standards with stakeholders 1.3 Determine project quality management approach, including proposed quality assurance processes and quality control measurement methods and benchmarks 1.4 Negotiate project quality, cost, time trade-offs and changes to stakeholder expectations if necessary 1.5 Develop a quality management plan for the project and obtain sign-off
2. Perform ICT quality assurance processes	2.1 Execute quality assurance activities as the project progresses according to the quality management plan 2.2 Identify project processes not meeting quality standards agreed in the quality management plan 2.3 Raise project change request to action process changes or corrective actions, update project management plan and quality baselines as necessary
3. Perform quality control	3.1 Validate project processes and deliverables against quality requirements as the project progresses 3.2 Review quality control metrics and take action as necessary to investigate and understand the reasons for failure 3.3 Use quality management tools to determine failures and root causes, and implement continuous improvement processes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 2.1	• Interprets and analyses complex textual data to identify stakeholder requirements, establish project scope and identify issues
Writing	1.4, 1.5	• Compiles the project management plan using technical language appropriate to the readers • Presents project components in a logical and prescriptive manner to ensure clarity of expectations • Uses writing style that meets organisational requirements when presenting plans and negotiating approvals for complex projects
Oral Communication	1.1-1.5, 2.1-2.3	• Uses effective listening, questioning and summarising skills when participating or facilitating discussions crucial to the development of project management plans • Uses appropriate language when addressing individuals or groups and when discussing audit results and negotiations
Numeracy	1.4, 3.2, 3.3	• Uses mathematical and statistical formulae when validating researched data necessary to support the project management strategy and evaluate project quality metrics
Get the work done	1.1-1.5, 2.1, 2.2, 3.1, 3.2, 3.3	• Uses a combination of formal logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks • Identifies and evaluates alternative strategies and resources • May use formal analytical and lateral thinking techniques for identifying issues and generating and evaluating possible solutions • Recognises the potential of new approaches to enhance work practices and outcomes

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTPMG606 Manage ICT project quality	ICAPMG606 Manage IT project quality	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG606 Manage ICT project quality

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare a quality management plan
- identify and implement appropriate quality management processes within a complex information and communications technology (ICT) project
- evaluate performance using quality assurance processes
- prepare quality reports.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the problem-solving tools and techniques
- identify and explain project management roles and responsibilities
- outline the quality improvement processes and methodology
- explain the quality management theory, techniques, tools and methodologies
- identify and describe the purpose of quality standards and benchmarks.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- facilities suitable for holding quality assurance problem-solving workshops.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG607 Manage and control ICT project risks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage and control risks in an information and communications technology (ICT) project within small, medium or large organisations.

It applies to individuals who may be required to apply a high level of business, technical and risk management skills to ensure that project risks are managed and controlled in accordance with organisational risk management strategies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify project risks	1.1 Review project planning documents, organisational risk policies and relevant lessons learned from earlier projects 1.2 Identify major project risks and potential sources of project risk 1.3 Establish relevant risk management processes and procedures 1.4 Develop a project risk management plan, including a risk register in consultation with stakeholder and obtain sign-off
2. Treat project risks	2.1 Assess the likelihood of the risk occurring and the resulting consequence of the risk 2.2 Develop risk-response strategies and contingency measures as appropriate 2.3 Incorporate risk-response actions and contingency measures into the risk register and project schedule in consultation with stakeholders and obtain sign-off
3. Monitor project risks	3.1 Undertake activities to monitor the risk factors or identified events as the project progresses 3.2 Establish formal risk reviews at appropriate intervals or project milestones 3.3 Update risk register and raise project change requests to update baseline project schedule as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1	• Interprets and analyses complex textual information and other relevant data to ensure the proper identification of project risks
Writing	1.3, 1.4, 2.2, 3.3	• Uses technical language in compiling complex strategic documents and support materials, and presents this information in a logical manner using correct grammar and spelling
Oral Communication	1.2-1.4, 2.1-2.3, 3.1, 3.2	• Uses techniques including active listening, open-ended questioning and paraphrasing when gathering information • Uses appropriate language and style to present complex technical information and ideas appropriate to the audience
Get the work done	1.1-1.3, 2.1, 2.2, 3.1, 3.2, 3.3	• Uses a combination of formal logical planning processes and an increasingly intuitive understanding of context to identify relevant information and risks, and identify and evaluate alternative strategies and resources • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG607 Manage and control ICT project risks	ICAPMG607A Manage and control IT project risks	Updated to meet Standards for Training Packages. Minor edits to the competency title.	Equivalent unit

Links

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Assessment Requirements for ICTPMG607 Manage and control ICT project risks

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify actual and potential risks within a complex information and communications (ICT) project
- establish risk management processes and procedures
- develop and implement risk management plan
- monitor risk factors and update risk management strategies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the methods and techniques of risk management
- identify organisational policies relating to risk and organisational risk potential
- explain processes and techniques of business analysis
- outline the project management and systems development techniques and their associated potential risks.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- project documentation
- relevant organisational documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPMG608 Manage ICT project systems implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

ly to this unit at the time of publication. This unit describes the skills and knowledge required to manage the system-implementation process in an information and communications technology (ICT) project within small, medium or large organisations.

It applies to individuals who may be required to use high-level business management technical and communication skills to ensure that ICT projects are implemented to ensure alignment with project and system development documentation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for system implementation	1.1 Review relevant project and system development documentation 1.2 Consider organisational culture as part of an implementation risk analysis 1.3 Identify implementation options and constraints, and select a preferred approach in consultation with stakeholders 1.4 Develop a detailed implementation plan and a high-level training plan and obtain sign-off 1.5 Ensure the creation of system user documentation and obtain sign-off 1.6 Ensure the preparation of operations documentation and obtain sign-off
2. Manage organisational change	2.1 Communicate relevant information about the pending change through appropriate channels 2.2 Establish necessary support structures
3. Coordinate release management	3.1 Establish and confirm release management roles and responsibilities, including those of the release manager 3.2 Determine release configuration items, including any production system software, hardware and capacity changes required, and compile a request for change 3.3 Ensure the creation of required test environment 3.4 Establish ongoing monitoring procedure to cover the post-release warranty period 3.5 Undertake data conversion activities if needed
4. Manage acceptance testing	4.1 Review results of system test and ensure acceptance test entry criteria are met 4.2 Ensure test environment and ICT configuration management processes meet solution requirements and organisational standards 4.3 Ensure acceptance testing is performed and results are collated 4.4 Ensure test results meet acceptance test exit criteria and

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ELEMENT	PERFORMANCE CRITERIA
	obtain sign-off
5. Manage user training	5.1 Undertake training needs analysis 5.2 Review high-level training plan and schedule, and add detailed activities as necessary 5.3 Ensure training materials are prepared and user training is conducted
6. Release system to production	6.1 Develop an hour-by-hour action plan or checklist for release activities 6.2 Create a rollback strategy and plan to guide rollback of changes if required 6.3 Prepare appropriate communication to inform users of possible interruption to service due to the release 6.4 Manage the installation of the new release into production and ensure performance of operational verification tests and rollback changes if necessary 6.5 Review and update service level agreements (SLAs) and disaster recovery plan

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 3.1, 3.2, 4.1-4.4, 5.1-5.3, 6.4, 6.5	• Interprets and analyses complex textual information to ensure that all requirements are identified, understood and appropriately addressed
Writing	1.4-1.6, 2.1, 2.2, 3.1, 4.3, 5.1-5.3, 6.1-6.3, 6.5	• Uses high-level of narrative and technical language in developing and presenting ideas and information of a complex nature to ensure that these are understood by stakeholders • Presents qualitative test results in a manner that is consistent with organisational and industry standards
Oral Communication	1.1, 1.3-1.6, 2.1, 2.2, 3.1-3.5, 4.1-4.4, 5.1-5.3, 6.4	• Uses appropriate language and style, effective listening, questioning and summarising skills when presenting complex ideas to all stakeholders to ensure that project requirements and test results are clearly understood
Get the work done	All	• Develops flexible plans for complex, high-impact activities with strategic implications that involve a diverse range of stakeholders with potentially competing demands when preparing for system implementation • Sequences and schedules complex activities, monitors implementation and manages relevant communication when managing organisational change, coordinating release management, managing testing, user training and release of system to production • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG608 Manage ICT project systems implementation	ICAPMG608A Manage IT project systems implementation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPMG608 Manage ICT project systems implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review and analyse the project documentation and prepare an implementation plan
- communicate and establish structure in preparation for change
- coordinate the release of new system
- manage the system tests and acceptance
- manage the training of users
- release the system to production.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the methods and techniques of configuration management
- describe organisational policies and standards relating to information and communications technology (ICT) configuration management
- explain the business analysis, processes and techniques appropriate to the project
- explain the project management and systems development processes, as well as potential risks associated with implementation activities
- outline the structure and implications of disaster recovery plans and Service Level Agreements (SLAs)
- explain what a "training needs analysis" is and its role in a training program
- describe the purpose of a "rollback strategy" for an ICT project.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- industry software packages
- project documentation
- relevant organisational documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPMG609 Plan and direct complex ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, plan, control and finalise complex information and communications technology (ICT) projects.

It applies to individuals who may be required to use high-level business and project management skills to ensure effective and timely delivery of projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Project management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the strategic and operational needs of the ICT project during the planning phase	1.1 Identify the strategic and operational needs of the project during the planning phase 1.2 Identify and consider the project's strategic context and requirements 1.3 Identify and consider the organisation's strategic and business plans, and its output requirements 1.4 Identify and explore client requirements and the impact of legislation and industry codes and standards 1.5 Conduct a risk management analysis and develop and document a risk-management plan
2. Prepare the ICT project plan	2.1 Define and document precise specifications and terms of reference for the project 2.2 Identify and document project budget, specified to a level that can be used for the management of sub-tasks 2.3 Define skills needed for the successful completion of project 2.4 Define, document and secure physical and other resources required to support the project 2.5 Develop and document timelines, schedules and critical path for the project, taking into consideration contingencies and planning for time slippages 2.6 Define and document a consultation strategy or process that will be used to inform clients, contractors and other interested parties of the project's progress, and seek their input as required
3. Assemble the ICT project team and commence work	3.1 Secure and brief appropriate project-team members regarding the project, their roles, levels of delegated responsibility and the outcomes to be achieved 3.2 Implement effective communication processes to coordinate work and inform team members of progress 3.3 Identify and communicate clear reporting processes for team members
4. Manage the IT project	4.1 Monitor project progress according to project plan requirements, using appropriate project management tools and methodologies

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ELEMENT	PERFORMANCE CRITERIA
	4.2 Manage team member performance, ensuring that their output is directed to the key performance indicators identified in the project plan 4.3 Make corrections, changes and additions to the project plan in light of changing circumstances to ensure project aims and outcomes 4.4 Monitor resourcing to support the project and make corrections to reflect changing circumstances 4.5 Report overall project progress to senior management or funding bodies as required and in line with the project plan
5. Finalise the IT project	5.1 Finalise the project in line with the project plan 5.2 Conduct handover to staff members responsible for the ongoing implementation or maintenance of project products or services efficiently, effectively and in line with organisational procedures 5.3 Debrief project team members and relevant stakeholders about the conduct of the project and the outcomes achieved 5.4 Prepare a report analysing the strengths and weaknesses of the project plan and the conduct of the project
6. Use the IT project to contribute to improved policies and processes	6.1 Identify and analyse opportunities for wider organisational learning, including changes to processes or policies generated by the project 6.2 Forward opportunities for future further developments following project completion for consideration by senior management 6.3 Consider the strategic impact of the project and feed into the organisation's ongoing strategic planning processes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.3, 3.3, 4.1, 4.2, 5.1, 5.4, 6.1	• Interprets and analyses complex textual information to ensure that all requirements are identified, understood, addressed and aligned with the organisational strategic and operational plans
Writing	1.5, 2.1-2.6, 3.1-3.3, 4.3-4.5, 5.1-5.2, 5.4, 6.2	• Uses high level of narrative and technical language in developing and presenting ideas and information of a complex nature in a logical and sequential manner, to ensure that these are understood by stakeholders
Oral Communication	1.1-1.5, 2.1-2.6, 3.1-3.3, 4.1- 4.5, 5.2, 5.3, 6.2	• Uses appropriate language and style, and effective listening, questioning and summarising skills when presenting complex ideas to all stakeholders to ensure that project requirements are clearly understood
Numeracy	2.2	• Uses sound mathematical assumptions and applies equations in developing budgets
Interact with others	3.1-3.3, 4.2, 5.3	• Plays a lead role in situations requiring effective collaboration, demonstrating high-level influencing skills, focusing and shaping awareness, and engaging and motivating others, including those who are geographically dispersed
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • May use formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions • Recognises the potential of new approaches to enhance work practices and outcomes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPMG609 Plan and direct complex ICT projects	ICAPMG609A Plan and direct complex IT projects	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPMG609 Plan and direct complex ICT projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, implement, manage and finalise a complex information and communications technology (ICT) project
- manage planning processes, scheduling, human resources, reporting and response to contingencies
- align projects with organisational strategies and requirements
- assess outcomes and provide recommendations that will refine and improve future ICT project management processes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the concepts of risk management planning and processes
- outline computer software functions and operation, including relevant proprietary software
- identify relevant current legislation, codes and standards
- explain sustainability requirements and ratings, including:
  - reporting mechanisms
  - conservation of energy
  - management of other resources
- explain tools and models of project management
- identify and explain organisational frameworks and functions, including:
  - enterprises
  - government bodies
  - industry associations.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the ICT project management field of work and include access to:

- relevant computer software packages
- suitable hardware
- codes, standards and legislation relevant to the jurisdiction and the project
- project documentation
- research resources, including product information and data, theoretical texts and other information.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG301 Apply introductory programming techniques

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create simple applications or games.

It applies to individuals with responsibility for creating applications or games and includes creating code, using programming standards, testing, and debugging.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Apply language syntax and layout	1.1 Apply basic language syntax rules 1.2 Use language data types, operators, and expressions to create a clear and concise code 1.3 Apply the variables and variable scope 1.4 Use the library functions in a program 1.5 Use commenting to create a clear meaning to the code
2. Apply control structures	2.1 Apply the language syntax for sequence, selection and iteration constructs 2.2 Use logical operators to create expressions for use in selection and iteration constructs
3. Code using standard algorithms	3.1 Develop algorithms that use the sequence, selection and iteration constructs 3.2 Create and use arrays 3.3 Code the standard sequential access algorithms, for reading and writing text files, including end-of-file detection loops 3.4 Apply string manipulation
4. Test the code	4.1 Use debugging techniques to trace code execution and examine the variable contents to detect, and correct, errors 4.2 Create and conduct simple tests, to confirm that the code meets the design specification 4.3 Document the tests performed and results achieved
5. Create an application or game	5.1 Design an algorithm in response to basic program specifications 5.2 Develop the application or game to meet the program specification 5.3 Test and confirm that the application, or game, meets the initial specifications

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.2, 1.5, 4.3	• Prepares workplace documentation, according to organisational formats and protocols • Creates program code using the correct syntax
Numeracy	2.2, 3.1, 5.1	• Uses mathematical formulae to ensure that the program specifications are met
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 5.2, 5.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Uses problem-solving techniques to analyse the required outcomes, in order to determine the correct program code • Uses a formal decision-making process, identifying and evaluating several choices against a limited set of criteria, when selecting syntax • Evaluates the effectiveness of decisions in terms of how well they meet stated design specifications • Uses the features of digital tools to complete complex tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG301 Apply introductory programming techniques	ICAPRG301A Apply introductory programming techniques	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG301 Apply introductory programming techniques

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply programming language syntax, sequence, selection and iteration control structures to the development of an application, or game
- produce an application, or game, that is designed and built from the program specifications
- confirm that the created application, or game, meets the original program specifications, and obtain user sign-off for the completed program.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe common games programming languages, their syntax, and command structure
- describe the development of small-sized applications or games.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the requirement documents
- the site documents
- software development tools currently used in industry, such as a compiler
- an independent development environment (IDE).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG401 Maintain open-source code programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to contribute as a member of an open-source software project community, and to maintain open-source code.

It applies to individuals working in software and system development, and maintenance. They may work as open-source software developers who are required to build, test and distribute open-source software applications, or as programmers responsible for integrating open-source components, tools or technologies into their applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Investigate the open-source paradigm	1.1 Examine the open-source paradigm and analyse the differences with traditional software development models 1.2 Investigate the types of online resources 1.3 Investigate the types of project documentation 1.4 Recognise the role of an online community, and international collaboration 1.5 Examine motivational factors for contributors to open-source code 1.6 Analyse the open-source licensing models
2. Familiarise with target project	2.1 Examine the online resources associated with the target project 2.2 Download pre-built executable binaries to install, and run, the project 2.3 Download and analyse the supporting documentation
3. Prepare for maintenance activities	3.1 Select, and register with, a relevant online community open-source group 3.2 Download nightly snapshots of the latest source code and the supporting documentation 3.3 Build and execute a snapshot, where appropriate
4. Maintain the code	4.1 Access the project bug database, and select the bugs to be resolved or the features to be added 4.2 Make changes to the local copy of the code, in order to resolve selected bugs 4.3 Test the resulting code to ensure that it performs appropriately 4.4 Prepare the code patch for submission 4.5 Submit a code patch to the project 4.6 Use the appropriate software-development tools and environment
5. Maintain the documentation	5.1 Access the project documentation 5.2 Prepare and contribute new information, or updates, to the existing documentation

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Prepare and submit documented changes to the project
6. Participate in community	6.1 Exchange messages with other project members and actively participate in community activities 6.2 Take action to ensure that exchanges are socially acceptable 6.3 Submit the code and documentation code patches for inclusion 6.4 Access online project resources frequently, to keep up-to-date with the project and with community developments 6.5 Take action to ensure that community-participation standards are observed and maintained

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.6, 2.1, 2.3, 4.1	• Interprets complex technical, and non-technical, information from a range of sources
Writing	2.2, 2.3, 3.1, 4.2, 4.4, 5.2, 5.3, 6.1	• Selects the vocabulary, grammatical structures and conventions, appropriate to the context and audience
Interact with others	6.1, 6.2, 6.5	• Collaborates with others in order to achieve the best possible outcome • Selects and uses the appropriate conventions, and protocols, when conferring with community members
Get the work done	1.4, 1.5, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.5, 4.6, 6.1, 6.2, 6.3, 6.4, 6.5	• Applies analytical processes to resolve technical or conceptual problems • Systematically gathers and analyses all relevant information, and evaluates options in order to make informed decisions • Uses digital technologies to locate and store relevant information, and to communicate with others • Uses a range of sophisticated digital tools and techniques to meet the desired outcomes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG401 Maintain open-source code programs	ICAPRG401A Maintain open-source code programs	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG401 Maintain open-source code programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- contribute to an open-source project
- program source code changes and/or additions
- document changes or additions
- investigate, utilise and participate in online resources for the project's direction
- build, modify, and test the code
- participate in the online community.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain debugging and testing techniques
- describe documentation techniques, including internal documentation, user guides and technical documentation
- explain open-source development methodology
- describe online project communities, and their involvement in games development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- the internet
- technical requirements
- databases
- information repositories
- programming languages
- group-facilitation software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG402 Apply query language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to retrieve and manipulate information stored in information systems, using a query language.

It applies to individuals in a range of work environments, who are required to extract information from a source such as a database, a text file, or an extensible markup language (XML), by creating and running queries.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the requirements of developing queries	1.1 Recognise various query-related terminologies 1.2 Identify the type of data source for a chosen query language 1.3 Identify and use the necessary tools, and environment, in building queries
2. Write queries to retrieve and sort values	2.1 Use an expression to retrieve values from a single unit 2.2 Use an expression to combine values from more than one unit 2.3 Use an expression to sort values into a certain order
3. Write queries to selectively retrieve values	3.1 Use an expression to filter a sequence, based on a predicate or a condition 3.2 Use an expression to filter the subset of a sequence, based on a predicate or a condition 3.3 Use an expression to extract a specific value by position
4. Perform a calculation in queries	4.1 Use an expression to perform a calculation on numeric values 4.2 Use an expression to perform an operation on text values 4.3 Use an expression to perform an operation on date and time values

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3	• Analyses and interprets technical data to determine requirements
Writing	2.1-4.3	• Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Numeracy	2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3	• Makes basic calculations involving arithmetical operations • Makes estimates and comparisons involving date and time data
Get the work done	1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3	• Uses digitally-based technologies and systems to enter, store and manage data

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG402 Apply query language	ICAPRG402A Apply query language	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG402 Apply query language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select and use tools in developing, storing, and executing queries to extract the appropriate data required for ad hoc reports, or to support developers
- incorporate calculations using control statements, operators and functions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the information gathering methods
- outline the data analysis techniques
- define data mining
- outline the characteristics of the data source
- explain the features of the information system
- explain typical systems and procedures.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- a data source
- resources in the chosen query language
- documentation regarding client and functionality requirements
- resources to aid calculation.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG403 Develop data-driven applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create data-driven applications that access data from a range of sources, such as databases, object data sources or eXtensible markup language (XML).

It applies to individuals who may work as programmers or database application developers and who are responsible for data-access coding.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select data-access layer (DAL)	1.1 Review function of DAL in multi-layer application model 1.2 Determine data-access application programming interface (API) for connecting to various data sources
2. Establish connection with data source	2.1 Create and manage connection strings 2.2 Connect to data source by using different data providers 2.3 Create code to handle connection exceptions
3. Execute commands and return results from data source	3.1 Query data from data source 3.2 Retrieve data from data source as result sets 3.3 Manage result sets 3.4 Manage exceptions when retrieving data
4. Modify data in data source	4.1 Insert, update or delete data 4.2 Manage data integrity 4.3 Manage exceptions when modifying data
5. Manage disconnected data	5.1 Research disconnected data management strategy 5.2 Ensure that application can deal with disconnected data
6. Document data-access layer	6.1 Document code 6.2 Document database connectivity

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 3.1, 5.1	• Interprets complex technical documents to ensure outcomes are met
Writing	2.3, 3.1, 4.1, 4.3, 6.1, 6.2	• Completes workplace documentation accurately and in an appropriate format
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.2	• Uses digitally based technologies and systems to design and create complex models and codes • Identifies technical or conceptual issues and applies analytical processes to resolve these issues • Recognises opportunities to investigate potential new techniques to access data from various resources

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG403 Develop data-driven applications	ICAPRG403A Develop data-driven applications	Updated to meet Standards for Training Packages. Minor change to PC 1.1 to align with AQF level.	Equivalent unit

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Assessment Requirements for ICTPRG403 Develop data-driven applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select and code the data-access layer of multi-layer applications
- retrieve and update data from various data sources.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the features of object-oriented design and multi-layer applications
- outline relational database management systems
- describe object-oriented programming at an intermediate level
- outline the principles of a Structured Query Language (SQL).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development field of work and include access to:

- integrated development environment (IDE)
- data access application program interfaces (APIs)
- database management system software and files
- coding standard
- specific tools and licences, depending on particular data-access API
- different types of data-access methods including data retrieval and storage, back-end coding and disconnect data management
- eXtensible markup language (XML) documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG404 Test applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to prepare test plans, write test procedures or scripts according to test plans, and maintain test plans and scripts.

It applies to individuals who may be responsible for test plan preparation, execution, maintenance, and reporting of tests; as well as defect management in the software development life cycle.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine testing need in development	1.1 Identify testing role across software development life cycle 1.2 Identify testing types and testing tools 1.3 Recognise testing benefits, standard and terms
2. Prepare test plan document	2.1 Gather requirements to develop test plan 2.2 Analyse and identify test data using various test-case design techniques 2.3 Define and design test cases
3. Write and execute test procedures	3.1 Choose and adopt a unit test framework 3.2 Design and implement algorithm in test procedures 3.3 Perform test executions
4. Review test results	4.1 Record test results 4.2 Analyse test results 4.3 Produce test progress reports 4.4 Manage defects

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.2, 4.2	• Interprets technical documentation to determine requirements
Writing	3.2, 4.1, 4.3	• Completes workplace documentation accurately and in an appropriate format
Numeracy	3.2	• Creates and uses basic mathematical equations
Get the work done	1.2, 2.1, 2.2, 2.3, 3.1, 3.3, 4.2, 4.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload to achieve outcomes • Uses systematic, analytical processes, gathering relevant information, and identifying and evaluating options against agreed criteria when applying testing and debugging techniques • Employs a range of sophisticated digital tools and techniques to meet desired outcomes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG404 Test applications	ICAPRG404A Test applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG404 Test applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply test case design techniques to develop a test plan, and to test cases that adequately cover specific test requirements
- design, implement and execute test procedures, or scripts, by using a unit test framework and an integrated development environment (IDE)
- create test progress reports based on recorded test results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the characteristics of programming languages
- explain input and output requirements
- outline the life cycle for software development
- outline the processes and techniques for testing small-size applications.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- specific test requirements, such as the test-plan document
- suitable code to be tested
- word-processing software.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG405 Automate processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to write scripts to automate solutions, by using basic scripting processes, and application-specific scripting options.

It applies to individuals who may work in information and communications technology (ICT) support roles and who are required to automate tasks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop algorithms to represent a solution to a given problem	1.1 Develop an algorithm that is an exact and sufficient description of the solution 1.2 Develop an algorithm that takes account of all possible situations 1.3 Develop an algorithm that is guaranteed to end
2. Describe the structures of the algorithms	2.1 Use structures, sequence, selection and iteration 2.2 Use structures to describe algorithmic solutions to a problem
3. Design and write the script or code	3.1 Create an abstract design, to fulfil the requirements of the proposed process 3.2 Review the abstract design for any omissions or errors 3.3 Translate the abstract design to the chosen language 3.4 Create the internal documentation
4. Verify and review the script or code	4.1 Check the script or code, for syntax and semantic errors 4.2 Identify any areas that are not covered, or are covered incorrectly, in the script or code
5. Document the script or code	5.1 Create technical-level documentation 5.2 Create user-level documentation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.2, 4.1, 4.2	• Analyses complex technical documentation for any inconsistencies and errors
Writing	3.1, 3.3, 3.4, 5.1, 5.2	• Completes code and workplace documentation, using the vocabulary and form appropriate to the context and audience
Numeracy	1.1, 1.2, 1.3, 2.1	• Interprets, and manipulates, complex formulae and numerical information
Get the work done	1.2, 2.2, 3.1, 3.2, 3.3, 4.2	• Uses systematic analytical processes to review and identify coding errors • Uses familiar digital technologies and systems to access information, search and enter data, code, and to present information and communicate with others, cognisant of data security and safety

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG405 Automate processes	ICAPRG405A Automate processes	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG405 Automate processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop an algorithmic statement of a solution, for a set process
- produce a functional script to automate a set process
- document this script for internal and external stakeholders.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain debugging for a variety of scripting scenarios
- describe the principles of algorithms, and their application, in computer programming
- describe scripting language syntax
- identify and describe scripting techniques.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- applications capable of being scripted, or having their own scripting language
- templates for automating processes
- executable scripts for set repeat time slices, single runs or break-out loops
- debugging tools.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG406 Apply introductory object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the performance outcomes, skills and knowledge required to undertake introductory programming tasks using an object-oriented programming language, including tool usage, documentation, debugging, and testing techniques.

It applies to individuals who are programmers in a variety of fields and who are required to produce simple programs in object-oriented languages.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Apply basic language syntax and layout	1.1 Apply basic language syntax rules and best practices 1.2 Select and use language data types, operators and expressions, in order to create clear and concise code 1.3 Use the appropriate language syntax for sequence, selection and iteration constructs 1.4 Use a modular programming approach within member or function logic 1.5 Apply arrays, including arrays of objects to introductory programming tasks 1.6 Use standard-array processing algorithms 1.7 Use the facilities of the language to read and write data, from and to, text files, and record the outcomes
2. Apply basic object-oriented principles in the target language	2.1 Implement a class that contains primitive member or instance variables 2.2 Implement a class that contains multiple options for object construction 2.3 Implement a class that uses user-defined aggregation (object instance or member variables) 2.4 Use the facilities of the language to implement inheritance, to at least two levels 2.5 Use polymorphism at a simple level through inheritance, to enable the easy extension of the code
3. Debug the code	3.1 Use the language debugging facilities of an integrated development environment (IDE) 3.2 Interpret the compiler or interpreter messages to resolve syntax errors, and use debugging techniques to resolve logic errors
4. Document the activities	4.1 Follow organisational guidelines for developing maintainable code, and adhere to the provided coding standards, when documenting activities 4.2 Apply internal documentation to all the code created, and use the documentation tools available in the target language, when documenting activities

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ELEMENT	PERFORMANCE CRITERIA
5. Test the code	5.1 Create and conduct simple tests, to confirm that the code meets the design specification 5.2 Document the tests performed and the results achieved
6. Create an application	6.1 Develop a solution, when provided with a basic object-oriented design document 6.2 Refer to the appropriate documentation for the language

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.2, 4.1, 5.1, 6.2	• Evaluates, and integrates, information and ideas to construct meaning and selects, and applies, a range of reading strategies in relation to design specifications, coding standards, and coding- language documentation
Writing	1.1-1.7, 4.1, 4.2, 5.2	• Communicates relationships between ideas and information, in a style appropriate to the audience and purpose, and selects the vocabulary, grammatical structures and conventions appropriate to the text, in relation to coding, recording outcomes, and documenting activities
Numeracy	1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5	• Selects from, and flexibly applies, mathematical and problem-solving strategies and techniques, in a programming context • Uses formal written mathematical language and representation, in the context of programming
Navigate the world of work	1.1, 4.1	• Recognises and follows, explicit and implicit protocols, and meets expectations associated with own role, when developing code that is compliant with standards and organisational guidelines
Get the work done	1.1, 1.2, 3.1, 3.2, 4.2, 5.1, 6.1	• Uses a formal decision-making process, identifying and evaluating several choices against a limited set of criteria, when selecting language data types, operators and expressions • Evaluates the effectiveness of decisions, in terms of how well they meet the stated design specifications • Uses analytical processes to decide on a course of action, when translating requirements from the problem space to machine space, and when debugging • Utilises a broad range of features within applications in order to develop software programs • Recognises, and uses, a wide range of relevant language and symbols, when applying the coding syntax • Actively identifies systems, devices and applications with the potential to meet current and/or future needs regarding programming

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG406 Apply introductory object-oriented language skills	ICAPRG406A Apply introductory object-oriented language skills	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG406 Apply introductory object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use an application program to design, and build, standard reusable software modules in response to a design specification
- generate the code, and the documentation
- undertake testing and debugging, to meet specifications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the processes and techniques related to object-oriented programming, including the concepts and language used
- describe the process for developing small-size applications
- identify and outline the key features of a graphical user interface (GUI), for interaction with an operator.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG407 Write script for software applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan, design and build scripts, using a scripting language to construct a highly interactive and automated software application.

It applies to individuals who build and integrate interactive applications, or websites for internal, and public, sites. They may work as application developers, application-support personnel, programmers specialising in a scripting language, web application programmers, or web developers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the requirements of building the script	1.1 Identify the main characteristics of scripting languages 1.2 Identify and use a framework, and integrated development environment (IDE), to build the script using the chosen scripting language 1.3 Identify the protocols and the object model used in the chosen scripting language
2. Design the script	2.1 Create pseudo code to describe the logic needed in the script 2.2 Review pseudo code for missing logic and error
3. Write the script	3.1 Translate pseudo code into scripts, incorporating the use of basic language elements 3.2 Create internal documentation in the script 3.3 Incorporate item manipulation using the chosen scripting language 3.4 Review, debug, and document the script

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.2, 3.4	• Applies the appropriate strategies to construct meaning from the requirements and technical documentation • Interprets and critically analyses, complex scripting language texts, and pseudo code when reviewing for missing logic, error and bugs
Writing	2.1, 3.2, 3.4	• Selects the vocabulary, grammatical structures and conventions appropriate to text, when documenting script and using pseudo code
Get the work done	1.1-1.3, 2.1, 2.2, 3.1-3.4	• Uses systematic, analytical processes, identifying and evaluating scripting language texts, and pseudo code, against the agreed criteria when reviewing for missing logic, error and bugs • Considers the purpose, needs and limitations when selecting a framework and IDE to build script • Recognises and uses a wide range of relevant language and symbols, when using pseudo code and scripting language, and when creating documentation

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG407 Write script for software applications	ICAPRG407A Write script for software applications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG407 Write script for software applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, write, and integrate scripts into software solutions to accommodate specified application requirements
- test and debug scripts, to ensure that the software meets the specification
- use a framework and an integrated development environment (IDE) in developing scripts.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the platforms suited to software development
- identify and summarise, copyright and intellectual property legislative requirements
- describe the life cycle of software development
- describe the processes and techniques related to the development of small-size applications.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- a brief for the development of a small-size application
- the runtime environment
- the development environment
- scripting language.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG409 Develop mobile applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, debug, test, and deploy applications for hand-held devices, using development platform environments.

It applies to individuals who work as mobile device application developers. They may be programmers, game developers, designers, or testers who are working in the area of mobile applications development.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define a platform	1.1 Determine the target platform for the hand-held device 1.2 Choose and evaluate a development environment, based on the target platform and hardware 1.3 Prepare and configure the application development environment
2. Design the user interface for a mobile application	2.1 Create views for different screen orientations and resolutions 2.2 Integrate the appropriate navigation techniques 2.3 Design the page layout and content 2.4 Integrate the appropriate user input techniques
3. Permit the personalisation of parameters	3.1 Write the code to allow users to configure application settings 3.2 Write the code to allow users to configure application output, such as text size, brightness, and sound effects
4. Build a user interface for a mobile application	4.1 Itemise the required functionality 4.2 Build a user interface, in the determined development environment to fulfil this functionality
5. Connect to the data sources	5.1 Bind controls to data sources 5.2 Persist data using extensible markup language (XML) serialisation 5.3 Access remote data using XML web services
6. Test and debug a mobile device application	6.1 Test the application for overall functionality, according to the requirements 6.2 Iterate the application design, or build, until the test results meet the requirements
7. Deploy a mobile device application	7.1 Create an application packaging for deployment 7.2 Deploy an application to target devices

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2	• Interprets, and critically analyses, complex texts when choosing and evaluating a development environment
Writing	2.3	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience, when designing the content • Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and conventions appropriate to text, when designing content
Numeracy	2.3	• Extracts and evaluates the mathematical information embedded in a range of tasks and texts, when designing layout • Selects from, and applies, an expanding range of mathematical and problem-solving strategies, when designing layout
Get the work done	1.1, 1.2, 1.3, 2.1-2.4, 3.1, 3.2, 4.1, 4.2, 5.1-5.3, 6.1, 6.2, 7.1, 7.2	• Uses systematic, analytical processes, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Identifies concepts, principles and features of approaches in use in other contexts, and redesigns these to suit own situation • Understands, and explicitly applies, some basic principles of analytical and lateral thinking • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG409 Develop mobile applications	ICAPRG409A Develop mobile applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG409 Develop mobile applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the relevant mobile platform
- determine, prepare and configure a development environment
- design and build an application for the platform
- test and debug the application, to ensure that it meets requirements

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the considerations of mobile device hardware and networking, when programming
- summarise the principles of object-oriented programming
- describe user-interface design principles
- describe extensible markup language (XML) programming and web services
- explain the language integration for web design including:
  - hypertext markup language (HTML)
  - JavaScript
  - cascading style sheet (CSS)
  - Asynchronous JavaScript and XML (AJAX)
- identify and describe contemporary mobile platforms including:
  - mobile phones
  - pocket and tablet personal computers
  - digital assistants.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- mobile devices or simulators
- an integrated development environment (IDE)
- the internet, and web services
- the server system, with sufficient privileges to deploy applications
- specific tools and licences for platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG410 Build a user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, build, and test a user interface (UI) to specification, including command-line interfaces (CLI), graphical user interfaces (GUI), web user interfaces (WUI) and natural user interfaces (NUI).

It applies to individuals who work as user-interface designers, and are responsible for specifying the layout and style of the desired user interface. They may be developers working in the area of user interface design and implementation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Build a prototype user interface (UI)	1.1 Gather the requirements for the UI 1.2 Determine the application development language for writing the UI 1.3 Build a prototype, using the prototyping tools available in the determined language 1.4 Review the UI prototype with the client, and edit as required
2. Design the UI	2.1 Formulate the application content flow 2.2 Design the UI components 2.3 Define UI actions 2.4 Itemise UI events
3. Build the UI	3.1 Determine the appropriate language 3.2 Build the UI with the required functionality
4. Test the UI	4.1 Test the UI for overall functionality, according to requirements 4.2 Iterate the UI design, or build, until the test results meet requirements
5. Document the UI and obtain client sign-off	5.1 Document the user requirements 5.2 Document the UI 5.3 Obtain client sign-off to the completed UI

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.2	• Applies appropriate strategies in order to construct meaning from complex texts, when reading technical data
Writing	5.1-5.3	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text
Numeracy	2.2	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies
Navigate the world of work	5.1-5.3	• Recognises and follows explicit, and implicit, protocols, and meets expectations associated with own role when documenting user requirements, and gaining sign-off
Interact with others	1.4	• Participates in complex formal and informal conversations relevant to own role, initiating and taking the lead where appropriate
Get the work done	1.1-1.4, 2.1-2.4, 3.1, 3.1, 4.1, 4.2	• Uses a combination of formal, logical planning processes, and an increasingly intuitive understanding of context, to identify relevant information and risks, identify and evaluate alternative strategies, and resources, when gathering requirements • Uses systematic, analytical processes, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Actively identifies systems, devices and applications with the potential to meet current and/or future needs • Utilises a broad range of features within applications to improve personal productivity, optimising software functions

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG410 Build a user interface	ICAPRG410A Build a user interface	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG410 Build a user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design a fully functional user interface (UI) in consultation with the user, using the determined language
- create a prototype UI
- review the prototype with the user
- build the UI
- test that the UI is complete, consistent and functional
- document the user requirements, UI and client sign-off.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- apply a range of basic mathematical strategies
- use object-oriented programming
- use open-source development tools
- describe the process of small-size application development.

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Assessment Conditions

conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the internet, to use the online tools available for prototyping and UI design
- an integrated development environment (IDE) for the determined language
- specific tools and licenses available, depending on the particular platform including:
  - Windows
  - Linux
  - Unix
  - Mac
  - Google Chrome.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG412 Configure and maintain databases

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install a database, manage data, data access and data security, and improve database performance.

It applies to individuals responsible for the maintenance and coordination of database operations. They usually work in an organisation, providing daily services as database administrators, database developers, database coordinators, or application developers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the requirements of database administration	1.1 Identify the components of a database instance 1.2 Define and use tools to administer the database
2. Install and configure the database system	2.1 Verify the database software installation prerequisites 2.2 Install the database software and related services 2.3 Configure database instance, components and services 2.4 Perform data management tasks
3. Manage database security and integrity	3.1 Create and administer users 3.2 Create and manage the permissions to perform database operations 3.3 Create and manage roles
4. Optimise and back up database	4.1 Configure the database for backup and recovery operations 4.2 Create and manage database backups 4.3 Restore and perform database recovery 4.4 Tune and perform database optimisation
5. Document the database	5.1 Document the maintenance and tuning work performed on the database 5.2 Document the users added to system

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Applies appropriate strategies to construct meaning from technical specifications, when identifying the database components, and defining tools
Writing	5.1, 5.2	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text
Interact with others	2.1	• Seeks clarification when meanings and intended actions are open to interpretation, when verifying prerequisites
Get the work done	1.1, 1.2, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4	• Uses systematic analytical processes, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these when troubleshooting database technology • Utilises a broad range of features within database applications and tools, to improve personal productivity, optimising software functions for specific purposes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG412 Configure and maintain databases	ICAPRG412A Configure and maintain databases	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG412 Configure and maintain databases

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install and configure database software, according to requirements
- manage database files, integrity, users and security
- create backup and restore databases
- monitor database performance
- document the database work, and database users added.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of database design
- summarise the features of desktop operating systems
- explain the principles of relational databases
- describe the functions of computer hardware and components
- explain computer networking and components
- explain uses of structured query language (SQL).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the database-management system software
- specific requirements, including client and functionality requirements
- naming standard.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG413 Use a library or pre-existing components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, evaluate and incorporate pre-existing (re-use) components from a library, or other source, as part of a software project.

It applies to individuals working in a programming role in a variety of information technology areas, who are required to use programming libraries to support their work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify potential re-use units	1.1 Analyse the project design and functionality, to identify re-use components 1.2 Source re-use components with the desired functionality
2. Evaluate re-use components for suitability in parent project	2.1 Evaluate the re-use component, or libraries, for suitability for use within the parent software project 2.2 Compare the functionality of each potential re-use component to the functionality required by the parent project 2.3 Evaluate the cost of implementing the re-use component 2.4 Consider the technical impact on the parent project design 2.5 Consider re-use component vendor licensing issues 2.6 Finalise the selection of re-use components 2.7 Document selection, evaluation and decision processes, as part of the parent project design documentation
3. Incorporate the re-use components	3.1 Configure the development environment to include re-use components during the build process 3.2 Construct test programs or use provided example programs, to become familiar with re-use components, in preparation for incorporation into the parent project 3.3 Add re-use components to the parent project incrementally 3.4 Resolve re-use component dependencies 3.5 Assemble and test the parent project, with a focus on the functionality provided by the re-use components

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	2.7	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure, and the conventions appropriate to text when preparing documentation
Numeracy	2.3	• Selects from, and applies, an expanding range of mathematics and problem-solving, when evaluating costs
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5	• Uses systematic analytical processes in complex non-routine situations, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Utilises a broad range of features within applications to improve personal productivity, optimising software functions • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these to troubleshoot technology

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG413 Use a library or pre-existing components	ICAPRG413A Use a library or pre-existing components	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG413 Use a library or pre-existing components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify, evaluate, and select the appropriate components that may be re-used
- modify and integrate the re-used components into a project
- document the selection and evaluation processes
- test the functionality of the re-used components.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- define and prepare the contract's specifications
- outline, and apply, current industry development and design methodologies
- describe domain modelling
- recognise and apply generic specification
- define the content and structure of libraries
- select and apply the techniques for metrics collection
- recognise patterns, frameworks and idioms
- identify and apply repository tools.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- a reuse library
- the technical requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG414 Apply introductory programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to carry out programming activities using a procedural approach.

It applies to individuals working in programming, development and technical roles. They may work as programmers, software developers or may be IT staff with responsibility for conducting programming activities, including writing, maintaining and updating programs, defining data and file handling.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Apply basic language syntax and layout	1.1 Apply basic language syntax rules 1.2 Use language data types, operators and expressions to create clear and concise code 1.3 Use appropriate language syntax for sequence, selection and iteration constructs
2. Code using data structures	2.1 Use data structures 2.2 Write code to create and manipulate arrays 2.3 Design, define and use data structures
3. Code using standard algorithms	3.1 Create sequential search, binary search, insertion and deletion algorithms to operate on arrays 3.2 Code standard sequential access algorithms and random access algorithms
4. Debug code	4.1 Use stand-alone debugging tools or tools provided by integrated development environment (IDE) to debug code 4.2 Use a debugger to trace code execution and examine variable contents to detect and correct errors
5. Document activities	5.1 Follow organisational guidelines for developing maintainable code and adhere to provided coding standard when documenting activities 5.2 Apply internal documentation, suitable for use by peers, to all code created and use documentation tools available in target language when documenting activities
6. Test code	6.1 Design and document tests 6.2 Capture and record test results

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	5.1	• Interprets and critically analyses and applies appropriate strategies to construct meaning from complex texts
Writing	5.2, 6.1, 6.2	• Displays knowledge of structure and layout, employing broad vocabulary, grammatical structure and conventions appropriate to text
Navigate the world of work	5.1, 5.2	• Takes personal responsibility for following explicit and implicit policies, procedures and industry standards
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2	• Automatically implements standard procedures for routine decisions when programming, according to guidelines and standards • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options • Understands key principles and concepts underpinning the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG414 Apply introductory programming skills in another language	ICAPRG414A Apply introductory programming skills in another language	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG414 Apply introductory programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- perform coding activities to create, maintain and update programs using basic language and layout
- write coding using data structures and standard algorithms, and following guidelines
- debug code
- generate design and code documentation
- test and confirm that the application meets program specifications
- record the test results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe and explain programming techniques
- describe documentation techniques
- give details of application development processes
- summarise testing techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development field of work and include access to:

- integrated development environment (IDE) for the determined language
- specific tools and licences, depending on particular platform and language.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG415 Apply skills in object-oriented design

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce an object-oriented design from specifications, applying the cyclic process of iteration from identification of class, instance, role and type to the final object-oriented model of the application.

It applies to system designers who are required to design systems using an object-oriented method.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Derive high-level design from specification	1.1 Develop static class diagram from given set of specifications 1.2 Develop either collaboration diagram or sequence diagram from given set of specifications 1.3 Develop either activity diagram or state diagram from given set of specifications
2. Refine design	2.1 Investigate and refine behaviour, state of classes and collaboration between classes 2.2 Validate correct visibility of class services and state data 2.3 Identify generalisations within classes 2.4 Identify specialisations within classes 2.5 Apply principles of aggregation and composition to refine class design
3. Document design	3.1 Create detailed uniform modelling language (UML) static class diagrams 3.2 Create detailed UML collaboration or sequence diagrams 3.3 Create detailed UML activity or state diagrams

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3	• Interprets and critically analyses and applies appropriate strategies to construct meaning from specifications
Writing	1.1-1.3, 3.1-3.3	• Communicates complex relationships between ideas and information, matching style of writing and diagrams to purpose and audience
Get the work done	1.1, 1.2, 1.3, 2.1-2.5, 3.1-3.3	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria when refining the design • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options • Understands key principles and concepts underpinning the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG415 Apply skills in object-oriented design	ICAPRG415A Apply skills in object-oriented design	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG415 Apply skills in object-oriented design

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce an object-oriented design from requirements, documents or system specifications, including:
  - static class diagrams
  - collaboration or sequence diagrams
  - activity or state diagrams
- refine the design
- document the design.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain design quality metrics such as coupling and cohesion
- explain design refinement techniques
- describe programming design principles
- describe different programming methodologies
- outline various developmental life cycle options.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development field of work and include access to:

- system specifications
- requirement documents
- design specifications
- detailed design.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG416 Manage a software component re-use library

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to store, document and maintain information and communications technology (ICT) components for reuse.

It applies to individuals in a software development area who are required to manage a library that contains reusable code.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Specify the components for re-use library	1.1 Determine component suitability for reuse by checking its quality, and uses 1.2 Review the size and complexity of re-use components for generalisation, and remove project-specific refinements 1.3 Evaluate the components, including patterns, clusters and frameworks, and break them down into smaller components for greater flexibility or use 1.4 Review the components for duplication, and remove the duplicates
2. Document the re-use library	2.1 Document the components internally and externally, to ensure efficient retrieval 2.2 Document public constants, data structures, component interfaces and limitations 2.3 Document the possible relationships between data structures or objects 2.4 Provide an example code, demonstrating the use of components within the documentation 2.5 Document the development environment configuration 2.6 Provide simple test programs to prove the functionality of the library
3. Set up the library structure	3.1 Classify data structures or objects in a consistent and logical manner 3.2 Ensure that the library has a logical structure so that the user is aware of the library contents, and can understand the logic of how the functionality may be used by another developer 3.3 Develop the structure in such a manner that it avoids redundancy within the library 3.4 Configure the development environment to automate the build of re-use components, and the library 3.5 Take action to ensure that interfaces to the library components are consistent and abstracted 3.6 Add, update, and remove re-use components, as development is undertaken

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 3.2	• Critically analyses documentation from a variety of sources and records, and consolidates information
Writing	2.1-2.6, 3.3, 3.4, 3.6	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience • Displays a knowledge of structure and layout, employing appropriate vocabulary, grammatical structure and conventions
Get the work done	1.1-1.4, 3.1-3.6	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication in producing a logical structure for the component library • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria when determining the suitability of components • Applies formal problem-solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts, and identifying, and evaluating, several options for action • Uses a systematic process to identify possible solutions to a difficult problem • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG416 Manage a software component re-use library	ICAPRG416A Manage a software component re-use library	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG416 Manage a software component re-use library

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- manage a software component re-use library
- specify the re-use library components
- document the re-use library components
- ensure logical structuring and interface facilitate retrieval and use.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain abstraction of code module interfaces
- describe the features of component libraries
- explain the design paradigms
- describe patterns, frameworks and idioms
- describe the re-use components, and metrics
- describe the content and structure of re-use libraries.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- technical requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG417 Apply mathematical techniques for software development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use basic mathematical methods and operations in standard computer notation, Boolean algebra, data types and computer storage.

It applies to individuals in software development roles who are required to use mathematical constructions in programming.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manipulate algebraic terms, leading to the solution of linear equations	1.1 Position number types on the number line 1.2 Evaluate various numerical expressions involving integers, fractions and indices 1.3 Simplify various algebraic expressions involving integers, fractions and indices
2. Construct mathematical formulas	2.1 Solve simple equations 2.2 Convert formulas between standard algebraic form and computer form 2.3 Create several formulas in standard algebraic form and in computer form
3. Simplify and evaluate Boolean expressions and formulas	3.1 Simplify and evaluate several Boolean expressions 3.2 Complete truth tables based on simple Boolean expressions and logic 3.3 Simplify and evaluate several formulas
4. Manipulate number and character representation systems	4.1 Convert numbers between binary, decimal and hexadecimal number systems 4.2 Add, subtract and multiply numbers in binary 4.3 Determine binary memory storage of an integer and a character

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.1, 2.2, 3.1, 3.3	• Interprets, and critically analyses, information from a variety of sources and records
Numeracy	All	• Selects from, and flexibly applies, a wide range of highly developed mathematical and problem-solving strategies, and techniques, when solving equations, constructing mathematical formulas, simplifying and evaluating Boolean expressions and formulas, and manipulating number, and character, systems • Uses a wide range of mainly formal and some informal, oral and written mathematical language, and representation, when solving equations, constructing mathematical formulas, simplifying and evaluating Boolean expressions and formulas, and manipulating number and character systems
Get the work done	2.1, 2.2, 2.3, 3.1, 3.2, 3.3	• Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, when evaluating Boolean expressions and formulas • Plans and sequences complex tasks, efficiently and effectively

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG417 Apply mathematical techniques for software development	ICAPRG417A Apply mathematical techniques for software development	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG417 Apply mathematical techniques for software development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- solve and evaluate mathematical problems
- use mathematical formulae in standard and computer notation
- simplify and evaluate Boolean expressions and formulae
- manipulate binary, decimal and hexadecimal number systems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain Boolean algebra
- explain number types
- explain binary memory storage
- explain the application of mathematical terms and operations in computing
- explain the calculation tools available.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the programming language.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG418 Apply intermediate programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to carry out intermediate programming activities using another programming language. The language may be an object-oriented language.

It applies to individuals who are programmers in a variety of fields and who are required to produce software programs.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Code using user-defined data structures	1.1 Design, define and use data structures that are aggregate of other data types 1.2 Code using array of user-defined data types 1.3 Use facilities in language to create, manipulate and destroy dynamic variables such as arrays
2. Code using standard algorithms	2.1 Use modular programming approach to coding, including pass-by-reference parameter passing 2.2 Write code to create and manipulate 2-D array 2.3 Create and maintain sorted array and use language-provided facilities for sorting array of ordered elements 2.4 Code simple binary search technique for use with array of sorted data 2.5 Code binary file-handling solutions using random-access algorithms
3. Debug code	3.1 Use stand-alone debugging tools or tools provided by integrated development environment (IDE) to debug code 3.2 Use debugger to trace code execution and examine variable contents to detect and correct errors
4. Document activities	4.1 Follow organisational guidelines for developing maintainable code and adhere to provided coding standard when documenting activities 4.2 Apply internal documentation, suitable for use by peers, to all code created 4.3 Use documentation tools available in target language when documenting activities
5. Test code	5.1 Design and document tests 5.2 Undertake limited testing of produced code to ensure compliance with program specification 5.3 Capture and record test results
6. Create application	6.1 Build application in response to user requirement 6.2 Access multiple source-code files

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ELEMENT	PERFORMANCE CRITERIA
	6.3 Employ IDE project maintenance facilities or make files to automate program building 6.4 Develop program specification solution when provided with basic design document 6.5 Design algorithm and document, construct and test applications in response to problem description using target language 6.6 Document completed application

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1, 3.2, 4.1, 6.1	• Interprets and critically analyses and applies appropriate strategies to construct meaning from texts relating to organisational guidelines and coding standards
Writing	1.2-1.3, 2.1-2.5, 4.1, 4.2, 4.3, 6.1, 6.6	• Communicates complex relationships between ideas and information, matching style of writing to purpose and audience when documenting activities • Displays knowledge of structure and layout, employing broad vocabulary, grammatical structure and conventions appropriate to text when documenting activities
Navigate the world of work	4.1	• Takes personal responsibility for following explicit and implicit policies, procedures and industry standards
Get the work done	All	• Uses systematic, analytical processes, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options • Uses a systematic process to identify possible solutions to a difficult problem • Understands key principles and concepts underpinning the design and operation of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG418 Apply intermediate programming skills in another language	ICAPRG418A Apply intermediate programming skills in another language	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG418 Apply intermediate programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and build application programs in response to a user specification, including:
  - coding using user-defined data structures and standard algorithms
  - debugging and testing the code
  - producing technical documentation of activities and completed application.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe in detail:
  - dynamic variables
  - medium-size application development
  - standard array and file handling algorithms
  - user-defined data structures
- describe a limited range of development methodologies and their application
- outline the principles of language development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development field of work and include access to:

- software development environment
- technical requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG419 Analyse software requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research and analyse client requirements, produce a range of options, and create a software-requirements document.

It applies to individuals in a range of work environments who are required to perform an analysis role in formulating software requirements. They may work as database or computer developers, business analysts, or project managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Gather and confirm client requirements	1.1 Confirm the requirements, and the scope, of the project with the client 1.2 Gather information regarding requirements via sources of information and business processes 1.3 Analyse client requirements, to determine the project scope and the problem context or opportunity faced by the business 1.4 Document the client requirements, project's scope, related problems, and sources of information
2. Analyse the functional and related non-functional requirements	2.1 Map business processes using modelling tools such as unified modelling language (UML) 2.2 Determine the opportunities for business process efficiencies 2.3 Document functional, and related non-functional, processes
3. Analyse the feasibility of a project	3.1 Analyse the technical feasibility of the project 3.2 Analyse the operational feasibility of the project 3.3 Determine the budget and schedule feasibility of the project 3.4 Examine how the project will fit within the organisation
4. Develop high-level system solutions	4.1 Develop and document feasible solutions for client requirements 4.2 Explore and document the feasibility of each solution 4.3 Examine alternatives against project constraints 4.4 Document assumptions, dependencies and required resources 4.5 Produce a project risk analysis 4.6 Document future requirements
5. Prepare and publish the software-requirements documentation	5.1 Develop the software-requirements document 5.2 Submit the software-requirements report to the appropriate person for project approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3	• Interprets, and critically analyses, and applies the appropriate strategies to construct meaning from complex texts, when gathering and analysing information to determine client requirements, and the project's scope
Writing	1.4, 2.3, 4.1, 4.4, 4.6, 5.1	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience, and displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure, and the conventions appropriate to text
Oral communication	1.1	• Demonstrates flexibility in spoken texts by choosing the appropriate structures and strategies to extract main ideas from oral texts
Numeracy	3.3	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies, when determining the project budget and schedule feasibility
Navigate the world of work	5.2	• Recognises and responds to both explicit, and implicit, protocols when submitting the report to the appropriate person for approval
Get the work done	1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 4.5	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Uses a systematic process to identify possible solutions to a difficult problem • Uses familiar digital systems and tools to access, organise, analyse, and display information relevant to the software requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG419 Analyse software requirements	ICAPRG419A Analyse software requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG419 Analyse software requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- Analyse client requirements to create a software requirements document, including:
  - gathering, confirming and documenting client requirements
  - analysing functional and related non-functional requirements, and project feasibility
  - developing high-level system solutions
  - submitting documents for approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the client business domain
- describe content features, such as clarity and readability
- summarise the system's current functions
- explain document design and usability
- explain the functions and features, of templates and style guides
- summarise instructional design principles
- describe the role of stakeholders and the degree of stakeholder involvement
- explain two or more current industry systems development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- documentation regarding client and functionality requirements
- word processing software
- modelling software currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG425 Use structured query language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use a structured query language (SQL) to define, create, and manipulate database structures, and the associated data in a relational database.

It applies to individuals in a wide variety of information and communications technology (ICT) roles, where relational databases and SQL are being used.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Write a simple SQL statement to retrieve and sort data	1.1 Retrieve all the data from a single table 1.2 Retrieve data from specific columns in a single table 1.3 Use 'order by' to sort query output
2. Write an SQL statement that selectively retrieves data	2.1 Restrict the number of rows retrieved, by placing criteria in the 'where' clause 2.2 Restrict the number of rows retrieved, by placing specific criteria in the select statement 2.3 Use comparison operators in the 'where' clause to compare numeric, character, string, date and time data 2.4 Use Boolean operators with the correct precedence 2.5 Use criteria in the 'where' clause, to check for a range of values, to select values from a list, and to check for values that match a pattern 2.6 Use SQL syntax to suppress duplicate values from query results 2.7 Take action to exclude null values from a query result
3. Write SQL statements that use functions	3.1 Use arithmetical operators with the correct precedence 3.2 Use string functions, and operators, to obtain the required query output 3.3 Use mathematical functions to obtain the required output 3.4 Use date functions to obtain the required output 3.5 Use SQL aggregate functions to obtain the required output
4. Write SQL statements that use aggregation and filtering	4.1 Use 'group by' to aggregate data by multiple columns 4.2 Sort aggregated data in the query output 4.3 Filter aggregated data using the 'having' clause
5. Write SQL statements that retrieve data from multiple tables	5.1 Employ the inner join syntax, to retrieve data from two or more tables 5.2 Use 'left outer', 'right outer' and 'full outer' syntax, to join tables in the select statement 5.3 Use correct syntax in the 'where' clause, to retrieve data from

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ELEMENT	PERFORMANCE CRITERIA
	multiple tables 5.4 Write a union query that retrieves data from more than one table
6. Write and execute SQL sub-queries	6.1 Construct single and nested sub-queries 6.2 Construct sub-queries that return a single row and multiple rows 6.3 Use correlated sub-queries to retrieve required data 6.4 Write sub-queries that use aggregates
7. Create and manipulate tables	7.1 Identify the required columns, data types, keys, relationships, indexes and constraints 7.2 Use the relevant naming conventions for database elements 7.3 Create tables that implement the required elements 7.4 Manipulate tables to meet specific requirements
8. Create and use views	8.1 Create views that satisfy information requirements 8.2 Use check constraints in a view 8.3 Retrieve, insert, update, and delete data using a view 8.4 Drop a view from a database
9. Create and use stored procedures	9.1 Create and execute stored procedures that use SQL to retrieve, insert, or modify data, according to information requirements 9.2 Create and execute stored procedures, that use one or more parameters 9.3 Drop a stored procedure from the database 9.4 Create and test database triggers that automate data management, or perform specific required data-related functions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 7.1	• Interprets and critically analyses complex texts • Applies the appropriate strategies to construct meaning from complex texts
Writing	2.3-2.7, 3.1-3.5, 4.1, 5.1-5.4, 6.1-6.4, 7.3, 7.4, 8.1, 8.3, 9.1, 9.2, 9.4	• Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Numeracy	3.1, 3.3	• Selects from, and flexibly applies, a wide range of highly developed mathematical and problem-solving strategies and techniques in an SQL context • Uses a wide range of mainly formal, written mathematical language and representation, to communicate mathematically in an SQL context
Get the work done	All	• Sequences and schedules complex activities and monitors implementation, when analysing and organising data, according to requirements • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria, when evaluating business requirements in relation to the database design • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, when problem-solving in relation to typical warnings and syntax errors • Uses formal and informal processes to monitor implementation of solutions and reflect on outcomes when creating tables, views, and stored procedures • Uses a systematic process to identify possible solutions to a difficult problem when writing SQL statements and sub-queries • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these in relation to using SQL in a relational database

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG425 Use structured query language	ICAPRG425A Use structured query language	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG425 Use structured query language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- write a simple, structured query language (SQL) statement to retrieve and sort data
- write an SQL statement that selectively retrieves data
- write SQL statements that:
  - use functions and operators
  - use aggregation and filtering
  - retrieve data from multiple tables
  - write and execute SQL sub-queries
  - create and manipulate tables to meet specific requirements
  - create and use views that satisfy information requirements
  - create and use stored procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain client-server concepts
- explain data-integrity concepts
- describe data-modelling structures
- explain databases and database objects, including data types, data structures, identifiers and metadata
- summarise programming concepts
- give an overview of query design
- give an overview of relational database design
- describe the SQL client environment
- describe the SQL server architecture.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development, and include access to:

- special purpose tools, equipment and materials
- industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG426 Prepare software development review

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish the standards associated with information technology and communications technology (ICT) technical requirements, in the context of quality assurance processes applicable to software development.

It applies to staff in the software development area who are required to ensure that the software development process incorporates quality considerations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review the software standards	1.1 Ensure that stakeholders have an understanding of organisational requirements 1.2 Document the software standards, according to project standards
2. Review the implementation standards	2.1 Assign the software standards to functions, according to a detailed technical plan 2.2 Take action to ensure that the communication and distribution strategies are clear, coherent, and meet the overall project plan requirements 2.3 Monitor and report on the implementation of standards against the acceptance criteria and detailed technical specifications
3. Review the software metrics and milestones	3.1 Define metrics related to the project milestones, timeframe, and cost considerations 3.2 Develop a schedule of quality reviews 3.3 Determine quality considerations by identifying in-process measurement points that relate to critical organisational requirements 3.4 Determine a method to benchmark and scale achievement against stated stakeholder requirements and cost considerations 3.5 Report metrics and milestones to stakeholders in a clear and coherent manner, and take action to ensure the written agreement

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets and critically analyses, and applies the appropriate strategies, to construct meaning from complex texts relating to organisational requirements and project standards
Writing	1.2, 2.3, 3.5	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text, when documenting standards and reporting on implementation, metrics, and milestones
Numeracy	3.1	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies, in the context of metrics and cost considerations
Interact with others	1.1	• Recognises the importance of taking audience, purpose and contextual factors into account, when making decisions about what to communicate, with whom, why and how, in relation to ensuring stakeholder understanding of organisational requirements
Get the work done	1.2, 2.1, 2.2, 2.3, 3.2, 3.3, 3.4, 3.5	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication in relation to quality reviews • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Uses familiar digital systems and tools to access, organise, analyse and display information relevant to own role

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG426 Prepare software development review	ICAPRG426A Prepare software development review	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG426 Prepare software development review

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review the software standards, including:
  - ensuring that stakeholders have an understanding of organisational requirements
  - documenting software standards according to project standards
- review the implementation standards, including:
  - assigning software standards to functions, according to the technical plan
  - ensuring that communication and distribution strategies are clear, coherent, and meet requirements
  - monitoring and reporting on the implementation of standards
- review software metrics and milestones, including:
  - defining metrics
  - developing a schedule of quality reviews
  - determining quality considerations by identifying the in-process measurement points
  - determining a method to benchmark and scale achievement
  - reporting the metrics and milestones to stakeholders
  - ensuring the written agreement is met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and explain current industry-accepted software configuration management processes
- identify and explain quality assurance practices and standards
- explain software metrics development
- identify and describe the client business domain.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- technical specifications
- organisational standards, for documentation and version control
- project management process, and hierarchy
- organisational business processes
- software requirement specifications
- interface requirement specifications
- system requirements
- design specifications
- validated data
- project budget and timeframe.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG427 Use XML effectively

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create extensible markup language (XML) documents, web-service applications, and client applications to consume web services.

It applies to individuals who are web developers, web programmers or application programmers, who build Windows or web-based applications that access data in XML format, or who develop and consume web services.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Represent the structured data with XML	1.1 Gather information by analysing data, documents, and problem domains 1.2 Write a well-formed XML document by incorporating the appropriate structure and syntax 1.3 Validate the XML document using validation tools 1.4 Format the XML document using styling tools
2. Access and manipulate the XML document	2.1 Create a new XML document using an XML parser application programming interface (API) 2.2 Access and traverse elements, and attributes, using an XML parser API 2.3 Modify elements and attributes using an XML parser API 2.4 Delete elements and attributes using an XML parser API 2.5 Transform the XML document into a data object, using an XML parser API 2.6 Transform the data object into an XML document, using an XML parser API
3. Create a service-oriented application using XML	3.1 Define the web-services architecture and platform elements 3.2 Develop and deploy web-service applications using a language 3.3 Develop a client application to consume web service, using a language

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets and critically analyses, and applies the appropriate strategies, to construct meaning when gathering information by analysing data, documents and problem domains
Writing	1.2, 1.4, 2.1, 2.3, 2.5, 2.6	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes, and edits, computer code and technical data, ensuring the correct syntax and accuracy
Numeracy	1.2	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies in a range of contexts, identifying the order and position of elements in a sequence, when using XML
Get the work done	All	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Applies formal problem-solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts and identifying, and evaluating, several options for action • Utilises a broad range of features within applications to improve personal productivity, and optimising software functions for specific purposes

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Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Structure must include:	• child element • root element • sub-child element.
Syntax must use rules relating to:	• case sensitivity • closing tag • entity reference • proper nesting • quoted attribute values • single-root element.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTPRG427 Use XML effectively	ICAPRG427A Use XML effectively	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG427 Use XML effectively

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- gather relevant information and produce a well-formed, formatted and validated XML document
- use an XML parser to access, modify and transform the XML documentation
- create a service-oriented application using XML.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the hierarchy and tree structure
- explain the programming concept and language
- describe the main features and services of the world wide web (WWW)
- explain data modelling
- outline commonly used items in hypertext markup language (HTML)
- identify information system features
- identify source characteristics.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- tools to access and develop a data source, such as an integrated development environment (IDE), a text editor and a web browser
- specific requirements, including client and functionality requirements
- a web server and software that hosts the services to deploy and test, the web-service application
- libraries to develop the web service and client applications.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG428 Use regular expressions in programming languages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use regular expressions (regex) for manipulating text and data.

It applies to individuals who are programmers and system administrators, and whose main responsibilities are to code complex text processing, such as search-and-replace tasks, validate inputs, and create regex-based queries.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Differentiate the use of regular expressions in programming languages	1.1 Compare the regular expression features among the different languages and tools 1.2 Define the different regular expression engine types and how they work 1.3 Determine the programming language, and tools, for writing regular expressions
2. Code using regular expressions	2.1 Use regular expression characters, operators, anchors and quantifiers to match the patterns of text 2.2 Write regular expression patterns to search, and manipulate, text 2.3 Write code to split strings and collect matches 2.4 Validate user input using regular expressions
3. Test regular expressions	3.1 Use test tools to test and validate regular expressions 3.2 Capture results, and edit, as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets and critically analyses complex texts, and applies appropriate strategies, to construct the meaning from complex texts, when comparing regex features in different languages and tools
Writing	1.2, 2.1, 2.2, 2.3, 3.2	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience • Writes, and edits, computer code and technical data, ensuring the correct syntax and accuracy
Numeracy	2.1, 2.2, 2.3, 2.4	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options when evaluating, and comparing, tools and languages, and when using and testing regex • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG428 Use regular expressions in programming languages	ICAPRG428A Use regular expressions in programming languages	Updated to meet Standards for Training Packages	Equivalent unit

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Companion volumes available from the IBSA website:
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Assessment Requirements for ICTPRG428 Use regular expressions in programming languages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- compare regular expression (regex) languages, tools and engine types
- prepare and validate code using regex
- test and edit regex code.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe and explain the principles of:
  - coding
  - database systems
  - object-oriented programming
  - open-source development tools
  - small-size application development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the internet, in order to use the online tools available for regular expressions
- an integrated development environment (IDE)
- specific tools and licences, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG501 Apply advanced object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake advanced programming tasks using an object-oriented programming language.

It applies to individuals who are programmers producing complex object-oriented programming.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop client-server application	1.1 Build and test object-oriented applications 1.2 Make use of features of language that enable inter-process communication through at least one mechanism 1.3 Make use of features of language that enable remote procedure calls (RPCs) using class based on multiple inheritances 1.4 Build programs using classes based on nested classes
2. Develop graphical user interface (GUI)	2.1 Code to implement drag and drop 2.2 Develop GUI help files 2.3 Code using 2-D graphics
3. Build applications	3.1 Code within existing architectural framework 3.2 Ensure code follows standards for object-oriented language 3.3 Develop application that includes data transfer between client and server 3.4 Review concept of design patterns used by architectural framework
4. Debug code	4.1 Use stand-alone debugging tools or tools provided by integrated development environment to examine running code 4.2 Detect logical and coding errors using debugger 4.3 Detect and correct errors by tracing code and examining variable content
5. Test application	5.1 Design and document tests to be performed 5.2 Undertake limited testing of produced code to ensure it complies with program specification 5.3 Document test results
6. Document system	6.1 Demonstrate adherence to guidelines for developing maintainable code and company or institutional coding standards 6.2 Create code using supplied design documents 6.3 Create and maintain program documentation 6.4 Ensure that user documentation in form of online help is built into applications

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.2, 6.1, 6.2	• Interprets and critically analyses complex texts and applies appropriate strategies to construct meaning from complex standards and guidelines documents
Writing	5.1, 6.1, 6.3	• Displays knowledge of structure and layout, employing broad vocabulary, grammatical structure and conventions appropriate to text when creating program documentation and documenting tests and test results
Numeracy	1.3, 1.4	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies
Get the work done	All	• Accepts responsibility for planning and sequencing complex tasks and workload, taking into account capabilities, efficiencies and effectiveness • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, establishing criteria for deciding between options • Understands key principles and concepts underpinning the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG501 Apply advanced object-oriented language skills	ICAPRG501A Apply advanced object-oriented language skills	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG501 Apply advanced object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop client-server applications using an object oriented language
- produce a graphical user interface (GUI)
- build, debug and test the applications
- produce documentation for the applications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the architecture of a framework for web-enabled application development
- summarise the techniques for implementing inter-process communication
- describe the process for the development of large-size application
- identify and outline testing techniques as applied to distributed application development
- identify and outline techniques for implementing third-party supplied code.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development field of work and include access to:

- database management system (DBMS)
- networked computers
- software-development environment
- technical requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG502 Manage a project using software management tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use software management tools, to manage a project from initiation to completion.

It applies to individuals who work in a team, or who individually develop systems to specification, using software management tools to manage delivery within time and budget parameters.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select the software management tools	1.1 Determine the software development methodology to be used 1.2 Determine the project management software to be used 1.3 Determine the source-control system to manage the source code and to handle conflicts 1.4 Determine the collaboration software to be used
2. Use the software management tools	2.1 Create a project plan, according to the software requirement specifications 2.2 Define the source-control procedures 2.3 Create a collaboration environment
3. Monitor the use of software management tools	3.1 Monitor, and adjust, the project plan to maintain progress according to the project plan 3.2 Ensure that the code is correctly entered into the source-control system 3.3 Monitor the collaboration environment, and resolve issues where required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1	• Interprets and critically analyses, and applies, the appropriate strategies to construct meaning from complex texts
Writing	2.1, 3,1, 3.2	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure, and the conventions appropriate to text
Numeracy	2.1	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies
Interact with others	2.3, 3.3	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit the purpose and audience, and monitoring the impact when creating and resolving issues • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and, on occasion, taking a leadership role
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication, in a collaborative project environment • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options and seeking input, and advice from others, before taking action when necessary • Uses a range of digitally-based technology and applications to access and filter data, extract, organise, integrate, and share relevant information, in increasingly effective ways

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG502 Manage a project using software management tools	ICAPRG502A Manage a project using software management tools	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG502 Manage a project using software management tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use software management tools to manage the development of a system to specification
- select the software development methodology, project management software, source-control system, and collaboration software
- create, monitor and adjust a project plan, according to the requirement specifications
- define source-control procedures, and ensure the correct entries into the system
- create, monitor, and resolve issues in a collaborative environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the basic principles of project management
- describe the key features of the software development life cycle (SDLC)
- describe the importance of software specifications
- identify the methods and importance of version control.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the internet
- project management software
- source-control software
- specific tools and licences, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG503 Debug and monitor applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to debug and monitor a software application.

It applies to individuals who work as developers, testers and support engineers, using logging and tracing techniques to identify software problems and to monitor systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement a framework for logging and error handling	1.1 Determine the logging framework for writing text messages at a certain level or priority to log files, or for sending data to monitoring applications 1.2 Create a custom event log for an application 1.3 Analyse the logs to check the state of the running application
2. Debug and trace an application	2.1 Apply basic debugging techniques such as breakpoints, stepping through and over code, and stack trace 2.2 Identify and use the tools to debug software applications 2.3 Write the code for debugging (print, assert and stop statements)
3. Monitor the application's performance	3.1 Identify and use profiling tools to verify the parts of the system that consume the most resources, such as random access memory (RAM), central processing unit (CPU) and time 3.2 Analyse performance issues, and apply any changes to improve the performance of the application

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 2.2, 2.3, 3.1	• Interprets and critically analyses complex texts, and applies the appropriate strategies to construct meaning from complex texts
Writing	1.2	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure, and the conventions appropriate to text when creating a custom event log
Numeracy	1.3, 3.2	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies when analysing logs, and monitoring applications data
Get the work done	All	• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Uses a systematic process to identify possible solutions to a difficult problem • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG503 Debug and monitor applications	ICAPRG503A Debug and monitor applications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG503 Debug and monitor applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use a logging framework to create an event log for an application
- use tools and techniques to trace and debug an application
- use profiling tools to collect data about an application's performance, identify and analyse identified issues and implement changes to improve performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide examples of common logging frameworks. logging and tracing tools, and profiling tools
- explain the functions of profiling tools, and logging and tracing tools
- explain the basic principles of:
  - computer hardware, networking and components
  - database-management systems
  - object-oriented programming
  - open-source development tools
- describe procedures for developing small-size applications
- outline the software development life cycle (SDLC).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- sufficient privileges to use performance monitoring tools on client and server system
- specific debugging tools and licenses, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG504 Deploy an application to a production environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the, skills and knowledge required to install, uninstall, and configure an application to a production environment.

It applies to individuals responsible for the software deployments of enterprise applications. They may work as application developers, administrators, release managers or deployment coordinators.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan a software installation	1.1 Determine if a client system and a server system meet the requirements for installation 1.2 Determine an installation method 1.3 Review the security requirements 1.4 Prepare a software-installation plan
2. Perform the software installation	2.1 Create an install package for an application 2.2 Test the install package in a test environment 2.3 Deploy the install package to a production environment
3. Plan and test an application removal	3.1 Create an uninstall package for removal of installed components 3.2 Test the uninstall package in a test environment
4. Perform the database installation	4.1 Deploy a database from the development environment to the production environment 4.2 Specify the connection string to the database
5. Manage an application configuration	5.1 Configure the application to use parameters that are valid for the production environment 5.2 Use the configuration files to modify the deployment variables 5.3 Configure the security features in an application

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 5.3	• Interprets, and critically analyses, complex texts and applies the appropriate strategies to construct meaning from complex texts
Writing	1.4, 2.1, 3.1, 4.2, 5.1, 5.3	• Displays a knowledge of structure and layout employing a broad vocabulary, grammatical structure, and the conventions appropriate to text • Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Navigate the world of work	1.1, 1.3	• Identifies and complies with organisational requirements relevant to deployment of applications
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG504 Deploy an application to a production environment	ICAPRG504A Deploy an application to a production environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG504 Deploy an application to a production environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare plans for software installation taking into account data, resource and security requirements
- create application install and uninstall packages, and then test and troubleshoot any issues
- install a database to a production environment
- configure variables, parameters and security features for a production environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the basic principles of database management systems
- outline the software development life cycle (SDLC)
- explain the coding used to create deployment applications
- explain the information and communications technology (ICT) hardware, software, security protocols and standards and organisational policies relevant to deployment of applications.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- sufficient privileges to install packages on client and server system
- database management system software
- specific tools and licences, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG505 Build advanced user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, build and test an advanced user interface (UI), including interaction techniques, rich controls, improved client-side validation, customisation and personalisation, graphics and multimedia.

It applies to individuals who work as user-interface designers and who are responsible for managing, and implementing, complex UI design.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan the UI design	1.1 Determine the appropriate client technology, development tools, and platform for writing the UI 1.2 Review the conceptual design with the client, and edit as required 1.3 Design the UI layout and structure
2. Implement interaction techniques	2.1 Apply the interaction design patterns 2.2 Implement client-side validation
3. Implement a customisable and personalised UI	3.1 Build a customisable UI, to allow users to select their own customised version of the underlying application 3.2 Build a personalised UI to improve user experience
4. Implement the graphics and multimedia	4.1 Create and display the graphics 4.2 Add the multimedia content to an application

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets, and critically analyses, complex texts and applies the appropriate strategies to construct meaning from complex texts, when reading and interpreting technical information, and determining suitable technology and tools
Writing	1.3, 2.1, 3.1, 3.2, 4.1, 4.2	• Prepares documentation, expressing ideas and exploring complex issues, that is constructed logically, succinctly and accurately • Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Oral communication	1.2	• Demonstrates flexibility in spoken texts by choosing appropriate structures, and strategies, in a range of contexts, and applies appropriate strategies to extract the main ideas from oral texts, when communicating with the client about the conceptual design of UI
Numeracy	1.3	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies in a range of contexts, when designing layout and structure
Get the work done	1.1, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2	• Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these when troubleshooting existing technology • Seeks to understand the potential of new technology, in the context of implementing interaction, and customisable features, and graphics and multimedia, into the UI

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG505 Build advanced user interface	ICAPRG505A Build advanced user interface	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG505 Build advanced user interface

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply advanced techniques in order to create a complex user interface (UI)
- determine the client's technology, development tools, and the UI platform
- plan the layout and structure
- review the conceptual design with the client
- implement interaction techniques, including interaction design patterns and client-side validation
- implement a customisable and personalised UI
- create and display the graphics
- add the multimedia.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the concepts of programming, including:
  - client-side programming
  - object-oriented programming
  - web design programming in hypertext markup language (HTML), cascading style sheet (CSS), and JavaScript
- describe the purpose of UI prototyping
- outline the documentation requirements for UI development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- an integrated development environment (IDE)
- the client system, and the server system
- multimedia tools
- specific tools and licences, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG506 Design application architecture

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design the structure of software or systems components, and how they interact.

It applies to individuals who may work as software architects, developers, designers, software engineers or programmers responsible for designing, and building, solution architecture.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Gather and confirm the architecture requirements	1.1 Gather information regarding the architectural requirements 1.2 Establish and document the architectural requirements
2. Design layered architecture	2.1 Separate the areas of concern into logical layers 2.2 Determine cross-cutting concerns 2.3 Define the system into components 2.4 Identify the responsibilities of each component 2.5 Identify the interconnections between components
3. Plan a strategy to re-use components	3.1 Determine an appropriate strategy for communicating with external systems 3.2 Interact with existing legacy components
4. Design for globalisation and localisation	4.1 Determine culture specific information 4.2 Consider database design features 4.3 Select the appropriate user interface 4.4 Develop a software product for worldwide distribution 4.5 Develop a software product for a specific country

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.2, 2.3, 2.4, 2.5, 4.1	• Interprets complex technical, and non-technical, information from a range of sources
Writing	1.2	• Prepares technical workplace documents that fulfil the expectations of different stakeholders
Communicate with others	4.1, 4.2	• Identifies, and explores, the differences between a diverse range of people and cultures in a programming context
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 4.2, 4.3, 4.4, 4.5	• Takes responsibility for planning, sequencing, and prioritising tasks in order to achieve the required outcomes • Uses a range of digital tools and sophisticated techniques, to meet the desired outcomes • Identifies technical or conceptual issues, and applies analytical processes to resolve these issues • Uses analytical and lateral thinking to review current practices, and to develop new or improved software or systems

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG506 Design application architecture	ICAPRG506A Design application architecture	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG506 Design application architecture

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design layered applications to increase application performance, scalability and re-usability
- create flexible and configurable applications, and adapt these to suit different locales
- adapt a software product to a particular language, and culture, of the target market.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of database design
- outline current software development methodologies
- explain object-oriented programming and its role in application architecture
- describe the software development life cycle.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- both functional and non-functional requirements
- the tools to design software architecture
- specific information for the target culture, or language
- the appropriate learning and assessment support, when required.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG507 Implement security for applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement security for software applications, including code access security, security access control, cryptographic and secure, input and output handling.

It applies to individuals who may be responsible for coding secure software applications and who may work as software developers, software engineers, system and security administrators, and testers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement policy-based code-access security in an application	1.1 Identify the purpose of application security in software development 1.2 Configure the platform security configuration files using security configuration tools 1.3 Define a custom code access permission, to restrict access to protected resources or to run protected operations
2. Implement security access control in an application	2.1 Plan an authentication and authorisation strategy 2.2 Develop an appropriate authentication and authorisation strategy for an application
3. Write code to encrypt and decrypt data for secure communication	3.1 Analyse the standard cryptographic algorithms 3.2 Encrypt, and decrypt, data using standard cryptographic algorithms
4. Protect an application against injections	4.1 Plan secure input and output handling, to prevent vulnerabilities related to code injections 4.2 Use secure input and output handling

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1	• Evaluates complex and varied information, and concepts, in software security
Writing	1.2, 3.2, 4.2	• Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Get the work done	1.2, 1.3, 2.1, 2.2, 3.2, 3.1, 4.1, 4.2	• Takes responsibility for planning, sequencing and prioritising processes and tasks to achieve the required outcomes • Applies systematic and analytical problem-solving processes, in order to develop appropriate security access control strategies • Uses a range of digital tools and sophisticated techniques to meet desired outcomes • Is acutely aware of the importance of data security and of monitoring, and controlling, access to digitally stored and transmitted information

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG507 Implement security for applications	ICAPRG507A Implement security for applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG507 Implement security for applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the following must be provided:

- creating secure applications
- planning effective security strategies
- ensuring safe communications
- preventing security attacks.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

Evidence of the ability to:

- outline basic hardware, and networking
- outline basic programming algorithms
- explain object-oriented programming
- recognise the mathematics required for programming algorithms.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- security configuration tools
- the software development environment
- testing and debugging tools
- the network resources
- the appropriate learning and assessment support, when required.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG508 Create mashups

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to combine content from more than one source into new integrated applications, and to create custom mashups.

It applies to individuals responsible for developing modern web application (Web 2.0) using the enabling technologies to create mashup applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Remix elements from multiple websites to create new mashups	1.1 Analyse Web 2.0 concepts and the web as a platform 1.2 Search various application programming interface (API) providers, and the types of services available 1.3 Evaluate and select which APIs to use 1.4 Determine which programming language to use with the selected APIs 1.5 Create mashups of several services
2. Use mashup tools	2.1 Search various mashup tools 2.2 Evaluate and select which tool to use 2.3 Create mashups using the selected tool

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.1, 2.2	• Critically analyses documentation from a variety of sources and records, and consolidates the information to determine requirements
Writing	1.5, 2.3	• Writes and edits computer code, and technical data, ensuring the correct syntax and accuracy
Get the work done	1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3	• Systematically gathers and analyses all relevant information and evaluates options, in order to make decisions about APIs • Identifies technical or conceptual issues, and applies analytical processes, to resolve issues • Uses a range of digital tools and sophisticated techniques, to meet the desired outcomes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG508 Create mashups	ICAPRG508A Create mashups	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG508 Create mashups

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create programmable web applications that combine data and functionality from various sources, to create new services.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline hypertext markup language (HTML), cascading style sheet (CSS) and JavaScript
- outline server-side scripting language
- outline extensible markup language (XML), web services, Asynchronous JavaScript (AJAX), and metadata
- explain web design and development.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the internet, in order to use mashup tools, and API providers
- Web 2.0 tools
- an integrated development environment (IDE)
- the appropriate learning and assessment support, when required.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG509 Build using rapid application development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build using rapid application development (RAD) tools.

It applies to individuals who may work as programmers and who are required to develop new systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Construct an application using RAD	1.1 Capture and record business rules, using a methodology well-suited for the chosen RAD and RAD techniques 1.2 Design an application with a focus on modularity and future extension 1.3 Develop the code by other RAD tools 1.4 Build and demonstrate the completed transaction to the user, for revision within the agreed terms of reference 1.5 Take action to ensure that the design caters for continuous change, by involving the user in the iteration process 1.6 Provide quality assurance (QA) testing throughout the phase and provide feedback to the appropriate person 1.7 Use code optimisers and performance tools
2. Prepare the handover stage	2.1 Track the implemented modules, and follow up where necessary with the appropriate person 2.2 Review user and builds for each module in the deliverables as preparation for handover 2.3 Compare the specification and implementation schedules for each module, and confirm the functional requirements, according to the specifications 2.4 Document the completed work

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.2, 2.3	• Interprets and analyses complex technical documents
Writing	1.1, 1.2, 1.3, 2.4	• Documents technical processes and completes workplace documents, in a style and form appropriate to the audience
Interacts with others	1.4, 1.5, 1.6, 2.1	• Liaises with users, and manages changes in design, by collaborating with different stakeholders in the development process
Get the work done	1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.3	• Identifies technical, or conceptual issues, and applies analytical processes in order to resolve issues • Uses a range of digital tools and sophisticated techniques, to meet the desired outcomes • Takes responsibility for planning, sequencing and prioritising tasks, to achieve the required outcomes • Uses analytical and lateral thinking to review practices and to suggest improvements

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG509 Build using rapid application development	ICAPRG509A Build using rapid application development	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG509 Build using rapid application development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design an application and develop high quality code, according to client specifications
- provide quality assurance testing and monitoring
- effectively demonstrate use of code optimisers using rapid application development (RAD) techniques
- accurately document completed work.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline industry-accepted prototyping tools
- describe quality assurance practices as they relate to RAD
- describe the impact that the client business domain will have on RAD in particular there effect on:
  - cost
  - quality
- outline the role of the stakeholder, and the involvement required in RAD
- describe three or more current industry development methodologies
- identify and apply three or more programming languages
- identify and apply the most appropriate RAD tool, taking into consideration the targeted platform or multi-platform options.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the computer-aided software engineering tools (CASE) repository, to facilitate the re-use of templates and components
- CASE tools
- a code generator
- detailed user requirements
- prototyping software
- the requirements document, including the model and scope
- the appropriate learning and assessment support, when required.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG510 Maintain custom software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to maintain software so that it continues to meet client user requirements.

It applies to individuals who may work as programmers who are required to maintain existing software.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the software fault to be corrected	1.1 Collect and review the software fault details from sources 1.2 Obtain technical data to assist in identifying the problem 1.3 Clarify nature of the problem with appropriate person where necessary
2. Identify and isolate the fault	2.1 Review program documentation for specific modules in order to pinpoint problem areas 2.2 Review the source code for logic errors 2.3 Read manuals, help files and 'read me files' to determine if there is a known fix 2.4 Undertake additional testing to identify or duplicate fault 2.5 Escalate the difficult faults that cannot be identified
3. Design a fix for the fault	3.1 Ensure that the requirements needed to fix the fault are understood by the client 3.2 Consider alternative options and choose the most effective solution 3.3 Consider the possible impact of the fix on other parts of the system 3.4 Document the changes according to the organisational guidelines
4. Carry out the fix to the software	4.1 Identify, and obtain, access to the appropriate software development tools, source code, and libraries 4.2 Construct the appropriate code to correct the fault, according to organisational and programming standards 4.3 Compile, or regenerate, the code for changed programs and the associated modules 4.4 Correct, and resubmit, the code until error free 4.5 Document the changes, according to organisational and programming standards
5. Test the fix and associated system areas	5.1 Check logic to ensure that it works with test data, corrects original fault, and does not cause problems elsewhere 5.2 Request users to perform acceptance testing and record

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ELEMENT	PERFORMANCE CRITERIA
	outcomes
6. Hand over to systems operations area	6.1 Update the documentation to reflect all the changes made 6.2 Confirm acceptance by systems operations and arrange for sign-off, according to procedures

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.3	• Analyses and interprets complex technical documents for specific information
Writing	3.4, 4.5, 5.2, 6.1	• Completes workplace documentation using a tone and format appropriate to the end audience
Oral communication	1.3	• Articulates issues in a clear and succinct manner using language appropriate to the audience
Navigate the world of work	4.2, 4.5, 6.2	• Takes personal responsibility for following explicit and implicit policies, procedures and standards
Interact with others	1.3, 2.5, 3.1, 5.2, 6.2	• Liaises with various stakeholders and negotiates mutually agreeable outcomes
Get the work done	2.4, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 5.1, 6.2	• Identifies technical or conceptual issues, and applies analytical processes to resolve issues, with consideration of the possible impacts of various solutions • Uses a range of digital tools and sophisticated techniques to meet the desired outcomes • Takes responsibility for planning, sequencing and prioritising tasks to achieve deadlines

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG510 Maintain custom software	ICAPRG510A Maintain custom software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG510 Maintain custom software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- effectively maintain custom software
- apply a fix that works
- deploy a possible range of solutions to produce the same results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the concepts relating to analysing a system performance compared with the system's current functionality
- describe the processes and procedures relating to testing software systems
- describe current industry-accepted hardware and software products, as they relate to system maintenance
- specify the programming code required for the project
- describe the program documentation required
- describe the impact of changes on applications and systems
- identify and summarise the programming standards relating to custom software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the fault logs, and help-desk reports
- software development tools, documentation and environment
- source code and libraries
- the appropriate learning and assessment support.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG511 Monitor and support data conversion to new ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and support data conversion to a new information and communications technology (ICT) system.

It applies to individuals involved in the development process, who are required to convert data to work on new systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Monitor data conversion	1.1 Obtain the conversion supporting documentation, and apply it to the conversion process 1.2 Protect production data, by taking action to ensure backup before the conversion 1.3 Determine the requirements of the client, and the impact on the business operation 1.4 Identify and confirm the software, hardware or environmental prerequisites in the conversion plan 1.5 Validate data accuracy and integrity, according to conversion specifications 1.6 Identify data rejected by conversion tools, and carry out the actions detailed in the conversion plan 1.7 Document the data rejection or errant behaviour of the conversion process
2. Support conversion	2.1 Verify the results 2.2 Present results to the appropriate person and obtain sign-off 2.3 Maintain and document backup copies of the conversion files, according to requirements 2.4 Develop clear and coherent technical documentation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 1.5, 1.6, 2.1	• Interprets, and critically analyses, complex texts and applies the appropriate strategies in order to construct meaning from the supporting documentation for conversion, and when identifying prerequisites in the plan
Writing	1.3, 1.7, 2.3, 2.4	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text, when writing documentation, and when liaising with the client
Oral communication	1.3	• Demonstrates flexibility in spoken texts by choosing the appropriate structures and strategies, and applies these to extract the main ideas from oral texts when liaising with the client
Interact with others	2.2	• Selects, implements and seeks to improve protocols governing communications with clients and co-workers in a range of work contexts • Collaborates with others, sharing information to build strong work groups
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication when taking action to ensure backup before conversion • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria when validating data accuracy and integrity, and when verifying results • Recognises and anticipates an increasing range of familiar problems, their symptoms and causes, actively looking for early warning signs, and implementing contingency plans in relation to the data rejected by conversion tools • Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot, and understand, the uses and potential of new technology, when monitoring and supporting data conversion to a new ICT system

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTPRG511 Monitor and support data conversion to new ICT system	ICAPRG511A Monitor and support data conversion to new IT system	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG511 Monitor and support data conversion to new ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- obtain and apply the conversion supporting documentation
- ensure backup before conversion
- determine client requirements, and the impact on the business operation
- identify and confirm the software, hardware or environmental prerequisites in the plan
- validate data accuracy and integrity, according to the specifications
- identify the data rejected by the conversion tools, and carry out actions specified in the plan
- document any data rejection or errant behaviour of the process
- verify the results, presenting them to the appropriate person and obtaining sign-off
- maintain and document backup copies of the conversion files, according to requirements
- develop clear and coherent technical documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe current data modelling methodologies
- explain current industry data conversion tools
- describe current industry-accepted hardware and software products, including their general features and capabilities
- explain data conversion from legacy systems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- conversion specifications
- data conversion plan
- documentation guidelines
- sample data to be converted
- data conversion tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG512 Prepare for the build phase of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to prepare the development environment for the build phase, and coding, of an information and communications technology (ICT) system.

It applies to individuals in software development environments who are required to organise the documents, environments, and tools for the build phase of software development.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the best development platform for project	1.1 Identify the requirements of the development platform, using the detailed technical specifications 1.2 Match the technical specification of the development platform, with the technical specification of the project and with the quality standards
2. Identify the best development tools for project	2.1 Identify the functional requirements for development tools, using the detailed technical specifications and other program documentation 2.2 Evaluate the development tools for a match with the requirements, and document the evaluation outcomes 2.3 Select the appropriate development tools
3. Prepare the development environment	3.1 Obtain the components for the development platform, development tools and the required hardware 3.2 Install, configure and test the development platform and tools 3.3 Document the configuration of the development platform

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.3	• Interprets, and critically analyses, complex texts and applies the appropriate strategies, to construct meaning from complex documentation when selecting the platform and tools
Writing	3.2, 3.3	• Displays a knowledge of structure and layout employing a broad vocabulary, grammatical structure and the conventions appropriate to text, when developing documentation of platform configuration • Writes, and edits, computer code and technical data ensuring the correct syntax and accuracy
Get the work done	2.2, 2.3, 3.1, 3.2	• Plans a range of routine, and some non-routine tasks, accepting stated goals and aiming to achieve them efficiently when obtaining components required for the development platform, development tools and the required hardware • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria, when selecting and testing the platform and tools • Considers purpose, needs and limitations when selecting the development platform and tools • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these in the context of installing, configuring, and testing the development platform and tools

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTPRG512 Prepare for the build phase of an ICT system	ICAPRG512A Prepare for the build phase of an IT system	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG512 Prepare for the build phase of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the best development platform, according to the project's technical specifications and quality standards
- identify the best development tools, according to the functional requirements, and documenting selection and evaluation
- obtain components for the platform, tools and the required hardware
- install, configure and test the platform and tools
- document the configuration of the platform.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the client business domain
- explain current industry-accepted coding methods and standards in a recognised language, and in database management system (DBMS) modelling techniques
- outline the processes and techniques related to:
  - software and database design
  - architectures and their technical requirements
- describe the quality assurance practices required when building an information and communications technology (ICT) system.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- design specification
- software requirement specifications
- system requirements
- technical specifications
- version control standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG513 Coordinate the build phase of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to coordinate the day-to-day management activities during the build phase, and coding of, an information and communications (ICT) system, according to the design specifications and project plan.

It applies to individuals in the software development area who are required to synchronise the coding activities of a new system.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare the work	1.1 Review the specifications and standards for the project 1.2 Review the project documentation for the development environment 1.3 Analyse, and confirm, that the development environment matches the project documentation and meets the standards 1.4 Select the development tools
2. Coordinate the work	2.1 Determine the work units based on the design 2.2 Delegate the work units to the appropriate developers 2.3 Brief the developers on standards, procedures, schedules and other requirements 2.4 Implement project management techniques to ensure that all tasks are completed on time, and according to standards, and the specification
3. Coordinate the development environment	3.1 Implement and test the changes to the development environment, and document the outcomes 3.2 Update the project documentation for the development environment

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets, and critically analyses, complex texts and applies the appropriate strategies to construct meaning from specifications, standards and the development environment documentation
Writing	2.3, 3.1, 3.2	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience, and displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text
Oral communication	2.3	• Demonstrates flexibility in spoken texts by choosing the appropriate structures and strategies in a range of contexts
Interact with others	2.2, 2.4	• Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction, and taking a leadership role on occasion, when implementing project management techniques
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria, and implementing and testing changes • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG513 Coordinate the build phase of an ICT system	ICAPRG513A Coordinate the build phase of an IT system	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG513 Coordinate the build phase of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and confirm that the development environment matches the project documentation, and meets standards
- select the development tools
- determine work units based on the design
- delegate work units to appropriate developers
- brief developers on standards, procedures, schedules and other requirements
- implement project management techniques to ensure that tasks are completed on time, and according to requirements
- implement and test changes to the development environment, and document the outcomes
- update the project documentation for the development environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the client business domain, to inform the system build
- describe the client-server architecture
- describe the current industry-accepted coding in a recognised language, including features and capabilities
- summarise current industry-accepted database management system (DBMS) modelling techniques
- identify and describe current industry-accepted hardware, and software products, including their general features and capabilities
- describe the principles of contemporary databases development, and their application
- describe the quality assurance practices required for the build phase of information and communications technology (ICT) systems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- design specification
- software requirement specifications
- system requirements
- technical specifications
- version-control standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG514 Prepare for software development using rapid application development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to carry out rapid application development (RAD), in the context of preparing for software development. The selection and use of suitable RAD tools can have an impact on the cost and quality of a software project.

It applies to individuals who are programmers in a variety of information technology areas, who develop software using RAD.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine RAD requirements	1.1 Select and use, the most suitable industry-standard tool set 1.2 Implement a prioritised plan using a series of recursive stages of build, and review for delivery of the system 1.3 Implement and incorporate a physical database 1.4 Identify, document, and schedule the modules to be implemented by incremental development techniques 1.5 Identify and formally allocate responsibilities to the authorised user, and to suitably skilled builders, for each module 1.6 Plan for, and document, the endorsement of reviews, administration schedules and development milestones
2. Determine the work metrics	2.1 Set development goals 2.2 Seek and secure agreement on, and adherence to, a single common notation 2.3 Determine the tools, features and techniques most appropriate to the development environment 2.4 Facilitate, plan, develop, and document version and change-control methods 2.5 Facilitate training and exposure for the user participants via RAD
3. Implement the administration method	3.1 Determine and reach agreement of stakeholders on the specifications 3.2 Confirm the dates for milestones with stakeholders, and secure with written agreement 3.3 Inform the production system's parties, and secure with written acknowledgment 3.4 Administer and maintain, time-recording and management methodologies

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets, and critically analyses, complex texts and applies the appropriate strategies to construct meaning from complex technical documents
Writing	1.4, 1.6, 2.4, 3.2, 3.3	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text, when developing documentation
Oral communication	2.5, 3.1, 3.2, 3.3	• Demonstrates flexibility in spoken texts by choosing the appropriate structures and strategies, and applies appropriate strategies to extract the main ideas from oral texts when liaising with stakeholders, facilitating training and informing parties on the administration method
Interact with others	2.2, 2.5, 3.1, 3.3	• Recognises and applies, the protocols governing what to communicate, with whom, and how, when liaising with stakeholders, facilitating training and informing parties on administration methods • Recognises the importance of joint ownership of the process, and outcomes, and tries to identify common ground, shared goals, and agreement on the best course of action
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication, when implementing a prioritised plan and database, scheduling timelines, allocating responsibilities, and establishing goals and methods • Makes a range of critical and non-critical decisions in relatively complex situations, taking a range of constraints into account • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot and understand, the uses and potential of new technology

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG514 Prepare for software development using rapid application development	ICAPRG514A Prepare for software development using rapid application development	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG514 Prepare for software development using rapid application development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select, and use, a rapid application development (RAD) tool set
- implement a prioritised plan
- implement and incorporate a physical database
- identify, document and schedule the modules to be implemented
- identify and allocate responsibilities
- plan for and document the endorsement of reviews, administration schedules and milestones
- determine work metrics
- set the development goals
- seek and secure an agreement on, and adherence to, a single common notation
- determine the most appropriate tools, features and techniques
- facilitate, plan, develop and document version and change-control methods
- facilitate training and exposure for the user participants via RAD
- implement administration
- determine and secure the agreement of stakeholders
- confirm dates, and secure written agreement for the milestones
- inform the production-system parties and secure written acknowledgment
- administer and maintain, time-recording and management.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe commonly used and industry-accepted prototyping tools
- describe the client business and the impact on the software application
- identify, and describe, the programming languages commonly used for application development
- outline the quality assurance practices required for software development
- outline the industry development methodologies used for software development.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the computer-aided software engineering tools (CASE) repository, to facilitate the re-use of templates and components
- CASE tools
- detailed user requirements
- prototyping software
- the requirements document, including the model and scope.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG515 Review developed software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to review developed software in relation to quality standards. This involves reviewing quality standards, determining development quality issues, and closely reviewing specific quality areas.

It applies to individuals who are senior programmers who ensure the quality of software produced by others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review the quality standards	1.1 Review the organisation's quality standards, and the standards related to software development, and prepare them for use 1.2 Contact the appropriate person to discuss their involvement in the review, and establish their role 1.3 Determine and document the approach to be used to validate quality during the review
2. Determine development quality issues	2.1 Examine and document processes that have a significant impact on the quality of a particular product under development 2.2 Hold discussions on quality issues with the development staff and establish agreed actions 2.3 Allocate responsibilities to the development staff 2.4 Obtain agreement from the appropriate person on the procedures to ensure quality of development, where necessary
3. Review the specific quality areas	3.1 Review plans to ensure that they are adequate to control the quality of the development process 3.2 Review testing processes, to ensure that defect-free software will be developed 3.3 Examine documentation and methods for development, to ensure that the software will be supportable 3.4 Monitor the requirements to ensure that client needs are met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets, and critically analyses, complex texts and applies appropriate strategies, to construct meaning from the organisation's quality standards and the standards related to software development
Writing	1.3, 2.1	• Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text, when documenting the validation approach, and the processes, that have an impact on quality
Oral communication	1.1, 1.2	• Demonstrates flexibility in spoken texts by choosing appropriate structures and strategies in a range of contexts, and applies appropriate strategies, to extract the main ideas from oral texts
Navigate the world of work	2.4	• Recognises and responds to both, explicit and implicit, protocols within familiar work contexts and appreciates the importance of identifying, and responding to, protocols in new situations, in the context of gaining agreement on procedures
Interact with others	2.2	• Uses active listening, observational and questioning techniques in order to identify different perspectives, and confirm, clarify or revise understanding • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction, and taking a leadership role on occasion
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, and seeking input and advice from others, before taking action when necessary • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTPRG515 Review developed software	ICAPRG515A Review developed software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG515 Review developed software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review and discuss the organisation's quality standards relevant to software development
- determine and document quality standards and procedures that support the development of defect-free products to meet client requirements
- review plans, testing processes and documentation related to the quality of software development to ensure that client needs are met.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain
- summarise industry-accepted hardware and software products
- describe input and output drivers
- identify and describe operating systems
- identify and describe:
  - two or more procedural languages
  - three or more object-oriented languages
- describe quality assurance practices, and the identification of standards
- explain real-time programming techniques
- describe software application measuring and estimating methodologies
- describe software development and configuration management processes
- explain the process of software metrics development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- data dictionaries
- design specifications
- a data stream management system (DSMS)
- a simulated scenario
- Australian and international software quality standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG516 Develop integration blueprint for ICT systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to document and to maintain the details of the technology, and architectural components, incorporated into the integration blueprint for an information and communications technology (ICT) system.

It applies to individuals in senior roles in the development environment, who are required to integrate a series of components.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review the technical architecture documents	1.1 Review the technical architecture documents, supplemented with discussions where necessary 1.2 Identify, and evaluate, technical considerations that cover the overall requirements and provide the best technical fit against requirements 1.3 Update the integration blueprint according to best-fit technical specifications
2. Undertake compatibility tests	2.1 Assemble components and component technologies, according to design specifications 2.2 Test the components for functionality, against design specifications 2.3 Identify non-compliance, against technical specifications 2.4 Update the integration blueprint to reflect functionality and non-compliance changes
3. Assess the risk areas	3.1 Identify the scope of the modifications required from the compatibility test 3.2 Negotiate the modifications required with the suppliers, based on the outcomes of the compatibility test 3.3 Update the integration blueprint to reflect modifications to risk areas
4. Assess readiness for stress testing	4.1 Continue integration activities until the platform is stable 4.2 Evaluate the platform's compliance with technical requirements 4.3 Update the integration blueprint for stress testing

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets, and critically analyses, complex texts and applies appropriate strategies, to construct meaning from complex texts when reviewing technical architecture documents
Writing	1.3, 2.4, 3.3, 4.3	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience • Displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text
Oral communication	1.1, 3.2	• Demonstrates flexibility in spoken texts by choosing appropriate structures and strategies • Applies appropriate strategies to extract main ideas from oral texts when having discussions to supplement documentation and when negotiating modifications with suppliers
Interact with others	3.2	• Participates in complex formal and informal conversations relevant to own role, initiating and taking the lead where appropriate, in relation to negotiating with suppliers
Get the work done	All	• Uses a combination of formal, logical planning processes, and an increasingly intuitive understanding of context to identify relevant information and risks, and identify, and evaluate, alternative strategies and resources • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG516 Develop integration blueprint for ICT systems	ICAPRG516A Develop integration blueprint for IT systems	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG516 Develop integration blueprint for ICT systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review technical architecture documentation and update the integration blueprint
- undertake component compatibility testing and update the integration blueprint accordingly
- assess the risk of possible modifications and update the integration blueprint accordingly
- stabilise the platform, assess compliance with the technical requirements and update the integration blueprint.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the sources of technology suppliers and components
- outline contemporary industry development and design methodologies
- identify and describe, industry-accepted hardware and software products, features, and capabilities
- identify and describe, industry-accepted testing procedures
- describe the principles of stress load testing.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- design specifications
- a high-level, diagrammatic view of the main system components.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG517 Install, test and evaluate pilot version of ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install a pilot version of a developed information and communications (ICT) system, and test it with a small group of users, in order to evaluate it against the agreed criteria.

It applies to individuals who are senior staff in a development area who are required to test and evaluate new systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for the pilot system	1.1 Establish and confirm the objectives, success criteria and acceptance criteria, for pilot implementation 1.2 Identify and secure, the technical and organisational resources required for pilot implementation 1.3 Establish and confirm executive support for the pilot 1.4 Complete the project plan for the pilot, and refer the project documentation to the appropriate person for their approval
2. Install the pilot system	2.1 Install and configure pilot according to the project plan 2.2 Verify and record the technical readiness of the pilot 2.3 Take the necessary actions to determine accuracy of the data 2.4 Prepare a status report, and submit to the appropriate person for their sign-off
3. Test the pilot system	3.1 Work with stakeholders to identify and release the appropriate pilot group 3.2 Brief the pilot-team members on the objectives of the test 3.3 Train the pilot-team members in the new system 3.4 Run the test
4. Evaluate the results and feedback of the pilot	4.1 Assess computerised results of the pilot test 4.2 Interview pilot group members in order to obtain feedback 4.3 Document the feedback and results 4.4 Evaluate according to success, and the acceptance criteria previously established 4.5 Report the final recommendations from the pilot, with regard to a complete installation of the pilot system, to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets, and critically analyses, complex texts and applies appropriate strategies, to construct meaning from complex texts
Writing	1.4, 2.2, 2.4, 4.3, 4.5	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience and displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure and the conventions appropriate to text
Oral communication	3.1, 3.2, 3.3, 4.2, 4.5	• Demonstrates flexibility in spoken texts by choosing appropriate structures and strategies, and applies appropriate strategies, in order to extract the main ideas from oral texts
Numeracy	1.4	• Selects from, and applies, an expanding range of mathematical and problem-solving strategies in a range of contexts
Navigate the world of work	1.4, 2.4	• Recognises and follows, explicit and implicit, protocols, and meets expectations associated with own role
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, and seeking input and advice from others, before taking action when necessary • Understands the key principles and concepts, underpinning the design and operation of digital systems and tools

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTPRG517 Install, test and evaluate pilot version of ICT system	ICAPRG517A Install, test and evaluate pilot version of IT system	Updated to meet Standards for Training Packages Minor change to title	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG517 Install, test and evaluate pilot version of ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish objectives, acceptance criteria and resource requirements for implementation of a pilot system
- prepare a project plan for a pilot system, according to organisational requirements
- install and verify a pilot system
- test a pilot system with the pilot team
- evaluate the results and feedback on a pilot
- report on the outcomes of a pilot system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the role of stakeholders, and the degree of stakeholder involvement in the development of a pilot system
- explain three or more current industry information-gathering methodologies
- describe current industry system development and design methodologies
- describe current industry-accepted hardware and software products, providing an overview of general features and capabilities, and in-depth details of installing pilot systems
- describe the general features and capabilities of current industry-accepted system piloting methodologies
- outline quality assurance practices with regard to installing, testing and evaluating a system.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- pilot system
- planning documentation, including acceptance criteria
- technical materials
- interaction with others involved in the pilot.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTPRG518 Monitor the system pilot

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor the implementation of a system pilot, and to evaluate its performance through testing and review.

It applies to individuals who are senior programmers and systems analysts who implement systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Monitor the implementation of the pilot system	1.1 Review the pilot and the support documentation 1.2 Identify the pilot and system procedures 1.3 Supervise system functionality and integrity tests 1.4 Document the findings 1.5 Provide technical support, as required
2. Evaluate the pilot system	2.1 Review pilot operation against pilot objectives, and success criteria 2.2 Review client and executive feedback on the pilot, against the acceptance criteria 2.3 Identify and areas of success, and those needing improvement 2.4 Prioritise, implement and assess, the impact of required improvements 2.5 Document the review process and submit to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Interprets and critically analyses complex texts
Writing	1.4, 2.5	• Produces texts using required structure, layout and conventions
Navigate the world of work	1.2	• Identifies and follows relevant organisational policies and procedures
Get the work done	All	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Takes responsibility for decisions about when, and how, to complete tasks and coordinate with others • Reflects on outcomes and feedback from others in order to identify general principles and concepts that may be applicable in new situations • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, and seeking input and advice from others before taking action, when necessary • Understands the key principles and concepts, underpinning the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG518 Monitor the system pilot	ICAPRG518A Monitor the system pilot	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG518 Monitor the system pilot

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review documentation to identify pilot objectives, client requirements and relevant procedures
- observe and support testing and document findings
- evaluate the pilot's success using acceptance criteria and stakeholder feedback
- document the evaluation process, including successes, improvements and impact of changes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the current industry-accepted system of piloting methodologies including their general features and capabilities, with particular emphasis on acceptance criteria
- describe current industry system development and design methodologies
- explain three or more current industry information-gathering methodologies
- outline the role of stakeholders and the degree of stakeholder involvement
- describe the system's current functionality, with a specific emphasis on:
  - system integration
  - system response and recovery times
  - user interfaces
  - the validation of inputs and outputs.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- pilot plan
- acceptance criteria
- system to be piloted.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG520 Validate an application design against specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to check a software application design against the specifications, and to apply validation techniques across the system's life cycle.

It applies to individuals employed in the area of software development who are responsible for verifying and validating software design specifications. They may be software project managers, testers, software engineers, system analysts or software developers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate the software requirement specifications	1.1 Review the software requirement specifications document prior to design, to ensure that it is complete and correct 1.2 Validate the software requirement specifications document
2. Create a proof of concept prototype	2.1 Use rapid application development tools (RAD) to create a prototype system 2.2 Present the prototype system for demonstration to the appropriate person 2.3 Validate the proof of concept
3. Evaluate the software design	3.1 Determine if the design is complete, accurate, consistent and feasible 3.2 Validate the software design document 3.3 Validate the database structure and its elements 3.4 Validate the user interface (UI) 3.5 Review the software risk analysis
4. Evaluate the source code	4.1 Validate the consistency between the code and the software design document 4.2 Validate logical structure and syntax, using static analysis tools
5. Evaluate the testing requirements	5.1 Review and validate the test plans 5.2 Review and validate the test cases
6. Document the validation	6.1 Document the results of the validation exercise 6.2 Recommend the current software design, or itemise the required alterations 6.3 Submit the report to the appropriate person for action

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Interprets and critically analyses complex software-requirement specifications
Writing	6.1	• Prepares documents using required structure, layout, and conventions
Interact with others	2.2, 6.3	• Takes audience, purpose and contextual factors into account, when making decisions about what to communicate, with whom, why, and how
Get the work done	All	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Takes responsibility for decisions about when, and how, to complete tasks and coordinate with others • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, and evaluating options against the criteria • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG520 Validate an application design against specifications	ICAPRG520A Validate an application design against specifications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG520 Validate an application design against specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret and check software requirement specifications documents
- use rapid application development (RAD) tools to create and present a validated proof of concept prototype
- validate the software design, source code and testing requirements and document the results
- report on results of validation, including recommended actions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the database design and implementation
- describe business and technical modelling using UML tools at intermediate level
- outline current software development methodologies
- describe, in detail, the system development life cycle (SDLC)
- explain object-oriented programming
- describe open-source development tools
- describe software-testing techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- tools to create prototype systems
- static analysis tools
- test plan and test cases.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG523 Apply advanced programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake advanced programming tasks using a selected choice of another programming language. The language may be an object-oriented language.

It applies to individuals who are programmers required to develop program code.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Code using advanced data structures	1.1 Design dynamic data structures 1.2 Implement and use dynamic data structures, including double-linked lists and binary trees for coding
2. Code using advanced algorithms	2.1 Code using hashing techniques 2.2 Consider and record, the advantages and disadvantages, of at least three sorting algorithms 2.3 Code at least one sorting algorithm 2.4 Code advanced searching techniques for use with complex data structures
3. Write a simple multi-process application	3.1 Use features of the language that enable inter-process communication through at least one mechanism 3.2 Use features of the language that allow for operating system 'signals' to be captured and responded to
4. Use third-party libraries	4.1 Use a third-party library in the construction of an application 4.2 Reference third-party documentation 4.3 Use procedural techniques to write an application, to work within a graphical user interface (GUI) environment
5. Debug the code	5.1 Use integrated development environment (IDE) debugging facilities, or a stand-alone debugger 5.2 Use program debugging techniques to detect, and resolve, errors of syntactical, logical and design origin
6. Document activities	6.1 Use source-code version control 6.2 Adhere to guidelines for developing maintainable code, and to a set of provided coding standards 6.3 Apply suitable internal documentation to all the code created, using the tools available in the target language
7. Test the code	7.1 Design and document the tests to be undertaken 7.2 Undertake limited testing of the produced code, to ensure that it complies with the program specification 7.3 Capture the test results

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ELEMENT	PERFORMANCE CRITERIA
8. Create an application	8.1 Develop a solution, according to program-specification design document 8.2 Design the algorithm, and construct, and test, the application in response to a problem description and language

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.2, 6.2, 7.2, 8.1	• Interprets, and critically analyses, complex texts and applies the appropriate strategies to construct meaning from complex texts
Writing	2.2, 6.1, 6.2, 6.3, 7.1	• Communicates complex relationships between ideas and information, matching the style of writing to the purpose and audience, and displays a knowledge of structure and layout, employing a broad vocabulary, grammatical structure, and the conventions appropriate to text
Get the work done	All	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating, options against the agreed criteria • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options • Understands the key principles and concepts, underpinning the design and operation of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG523 Apply advanced programming skills in another language	ICAPRG523A Apply advanced programming skills in another language	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG523 Apply advanced programming skills in another language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and write code using dynamic data structures
- write code using hashing techniques, sorting algorithms and advanced searching techniques
- use language features that enable inter-process communication and responses to operating system signals
- use third-party libraries in the construction of an application, including referencing third-party documentation
- design and build an application program according to a design document
- test and debug code and resolve errors of a syntactical, logical and design origin
- produce documentation according to guidelines and standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe a range of programming languages
- identify and describe languages for a GUI environment
- summarise the techniques for developing large-scale applications
- outline the procedures for programming with complex data structures
- describe the procedures for using a third-party supplied library, for standard programming features.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the software development environment
- technical documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG524 Develop high-level object-oriented class specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse requirements and produce a set of high-level object-oriented class specifications.

It applies to individuals who are required to develop object designs as part of the systems design process.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the behaviour of objects	1.1 Analyse behaviour scenarios and the prepare documentation, according to standards 1.2 Identify classes, objects and abstract data types, according to requirements 1.3 Prepare class, object, module and process diagrams, according to specifications
2. Prepare a state model	2.1 Analyse data requirements and iterate data flows 2.2 Prepare state-transition diagrams, according to standards 2.3 Improve the abstract data types and specifications
3. Describe the roles and responsibilities of classes	3.1 Review the functional requirements, assign responsibilities and update class structures 3.2 Specify the interface and class communication requirements 3.3 Prepare the interaction diagrams, according to standards
4. Iterate and review the object model	4.1 Review the current object model, class functionality and data transformation 4.2 Identify and develop class relationships, priorities, and the inheritance hierarchy 4.3 Review the class-service requirements and initial test criteria 4.4 Identify object processes and reuse classes 4.5 Document the model and forward it to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 4.1, 4.2	• Interprets, and analyses, complex technical documentation
Writing	1.1, 1.3, 2.2, 3.3, 4.5	• Accurately records and completes documentation according to organisational formats and protocols • Writes and edits documents to ensure accuracy and consistency of information, and clarity of meaning
Interact with others	4.5	• Shares knowledge, information and experience openly, liaising with colleagues to achieve the best possible outcome
Get the work done	1.3, 3.1, 3.2, 4.1, 4.2, 4.3, 4.4	• Uses a range of digitally-based technologies to access, extract and share relevant information, in order to achieve the required outcomes • Identifies technical or conceptual issues, and applies analytical processes, to resolve these issues • Uses analytical and lateral thinking to review current practices, and to develop new or improved software or systems

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG524 Develop high-level object-oriented class specifications	ICAPRG524A Develop high-level object-oriented class specifications	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG524 Develop high-level object-oriented class specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- specify and model abstract data types
- specify the interface between classes and objects
- document the results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline configuration management
- outline current industry-accepted object-oriented methodologies
- outline current program development methodologies
- describe data modelling techniques
- describe object-oriented analysis tools
- describe quality assurance practices.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the business, system and user requirement
- a unified modelling language (UML) modelling tool
- the appropriate learning and assessment support, when required.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG525 Build Java applets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to compile and run an applet that executes in Java-enabled browsers, and interacts with users.

It applies to individuals involved in software, web or games development and who are required to build applets, using Java that interacts with users via a browser.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create Java source file	1.1 Create a file with a text editor 1.2 Create a sub-class of the class Java.applet. 1.3 Ensure that applet sub-class implements at least one of the following methods: init and paint 1.4 Define classes that contain instance variables, methods and local variables 1.5 Ensure that the init method initialises instance variables, and constructs any graphical interface used in the applet sub-class 1.6 Implement the paint and update methods to manage output that is drawn in the applet window 1.7 Incorporate event handling methods 1.8 Implement the code that allows a user to enter values, and assigns these values to variables 1.9 Use available graphical user interface (GUI) components to allow user interaction with the applet 1.10 Specify and load images and sounds 1.11 Include comments to describe the behaviour of the applet
2. Compile a source file	2.1 Use a Java compiler to compile the file 2.2 Correct errors detected by the compiler 2.3 Confirm basic correctness of the file, to ensure that all variables have been initialised 2.4 Ensure the compiler creates a class file, and that the class is interpreted correctly
3. Run applet	3.1 Create and name a hypertext markup language (HTML) file, and add APPLET tag 3.2 Write the applet class file to match the HTML document that contains an APPLET tag 3.3 Confirm that the applet loads and executes correctly 3.4 Identify and correct run-time errors 3.5 Identify and correct logic errors 3.6 Ensure that the appearance of the applet window renders it accessible and intuitive for the user, and that its design complies

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ELEMENT	PERFORMANCE CRITERIA
	with organisational standards 3.7 Ensure that user interaction is implemented efficiently and effectively

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 3.4, 3.5	• Recognises and interprets complex information
Writing	1.1, 3.1	• Develops material for a specific audience, using clear and detailed language
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 2.1, 2.3, 2.4, 3.3, 3.4, 3.4, 3.6, 3.7	• Takes responsibility for planning, sequencing and prioritising tasks to achieve the required outcomes • Uses a range of digital tools and sophisticated techniques to meet the desired outcomes • Identifies technical or conceptual issues, and applies analytical processes, to resolve these issues

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG525 Build Java applets	ICAPRG525A Build Java applets	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG525 Build Java applets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review the requirements to provide an applet that executes in Java-enabled browsers, and allows users to customise the applet's operation
- write, compile and run an applet that accepts user input, and generates a response based on the input.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain object-oriented programming concepts
- outline the theoretical concepts of Java programming
- recognise, and describe, the Australian Computer Society Code of Ethics
- identify the sources of browser security restrictions.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the Java development environment
- a Java compiler and interpreter
- a Java-enabled web browser
- the appropriate learning and assessment support.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG526 Maintain functionality of legacy code programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to maintain the functionality of legacy code programs.

It applies to individuals working in software development who are required to maintain legacy programs, updating them as required.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the functional changes required	1.1 Consult the user to determine, and document, the functional change required 1.2 Clarify the impact of changes with operational personnel
2. Review legacy language	2.1 Identify the basic structures of the legacy language 2.2 Review the data storage of the legacy language with regard to global variables, modularisation, cohesion and coupling 2.3 Review the basic algorithms of the legacy language
3. Identify and isolate the change	3.1 Review the technical documentation for the system, to determine which modules to change 3.2 Review the source code to determine program logic and flow 3.3 Update the technical documentation to reflect the current state of the program
4. Determine the framework for change	4.1 Determine the change approach to be used to implement the change 4.2 Ascertain and detail the risks for each approach 4.3 Determine the personnel who will make the changes
5. Design the change	5.1 Develop the changes required, considering the impact of the changes on other parts of the system 5.2 Document the changes according to change-management standards
6. Code the change	6.1 Identify and obtain, the appropriate hardware and software for the change 6.2 Write the code according to programming standards 6.3 Compile and unit test the changes 6.4 Document the changes according to programming standards
7. Test the change	7.1 System test the changes and record the outcomes 7.2 Perform user acceptance testing and record the outcomes 7.3 Sign off the change request
8. Archive the system	8.1 Create a new version of software, according to configuration

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ELEMENT	PERFORMANCE CRITERIA
	management standards 8.2 Archive the development system, including the source code, compilers and test data

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.2, 2.3, 3.1, 3.2	• Analyses, and interprets, technical information and defines specific features
Writing	3.3, 4.2, 5.2, 6.2, 6.4, 7.1, 7.2	• Completes documentation accurately using industry-relevant terminology and the appropriate structure for the target audience
Interact with others	1.1, 1.2	• Shares knowledge, information and experience openly, liaising with colleagues to achieve the best possible outcome
Get the work done	4.1, 4.2, 4.3, 5.1, 6.1, 6.3, 7.1, 7.2, 7.3, 8.1, 8.2	• Uses a formal change management process, identifying and evaluating several choices • Evaluates the effectiveness of decisions, in terms of how well they meet stated design specifications • Uses the features of digital tools to complete complex tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG526 Maintain functionality of legacy code programs	ICAPRG526A Maintain functionality of legacy code programs	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTPRG526 Maintain functionality of legacy code programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- read legacy language
- identify and isolate the required change
- implement the change via the chosen technique.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain operational procedures on the required operating system
- outline the organisational standards for software development
- define security and viruses
- identify privacy legislation and copyright with regard to the legacy code, the particular system involved and its data
- define the technical terminology related to reading help files and manuals
- outline different types of software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- documents detailing the organisational standards for software development
- the existing legacy code
- appropriate compilers
- the appropriate learning and assessment support.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG527 Apply intermediate object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake intermediate level programming tasks using an object-oriented programming language.

It applies to programmers in a variety of fields who are required to produce programs in object-oriented languages.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Build applications using the provided language utilities	1.1 Review the program requirements 1.2 Divide multiple source-code files into logical units and packages 1.3 Use at least two of the utilities of the target language, allowing for the internal storage of collections of data 1.4 Use the utilities of the target language, providing internal data-sorting and searching facilities 1.5 Employ integrated-development environment facilities, to make files to automate program building 1.6 Follow the guidelines for developing maintainable code, adhering to coding standards 1.7 Use the facilities in the language for persisting objects to binary files 1.8 Use the operator and function or method overloading facilities available in the language, at an introductory level 1.9 Use exception-handling techniques to ensure program stability 1.10 Use of a class that is based on multiple inheritances
2. Write programs that interact with a database	2.1 Design and implement programs that connect to a database 2.2 Design and implement programs that use the language facilities to extract, update, and delete data stored in a database 2.3 Design and implement programs that use the language facilities to manipulate database structure (query, create and delete) 2.4 Write programs that deliver transactional integrity
3. Write the graphical user interface	3.1 Employ the graphical user interface (GUI) framework, or text windowing interface, appropriate to the chosen language 3.2 Use standard GUI components 3.3 Use the facilities within the language for GUI objects to respond to user and program-generated events
4. Debug the application	4.1 Use stand-alone debugging tools, or tools provided by the integrated development environment, to examine variables, and trace the running code 4.2 Use the debugger to detect logical and coding errors

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ELEMENT	PERFORMANCE CRITERIA
	4.3 Use the tracing of code and examination of variable contents during execution, to detect and correct errors
5. Test the application	5.1 Design and document limited tests of code 5.2 Undertake limited testing of the produced code to ensure that it complies with the program specification 5.3 Capture and document the test results
6. Create and maintain documentation	6.1 Read and interpret the supplied design document, to create the code 6.2 Create and maintain program documentation

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.6, 6.1	• Analyses and interprets technical documents
Writing	2.2, 2.3, 3.1, 3.3, 5.1, 5.3, 6.2	• Completes technical documentation, selecting the appropriate vocabulary and structure for the intended audience
Get the work done	1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2	• Creates, and selects, an appropriate application that meets the set requirements • Uses a range of digitally-based technologies to access, extract, and share relevant information in order to achieve the required outcomes • Identifies technical or conceptual issues, and applies analytical processes, to resolve these issues • Uses analytical and lateral thinking to review current practices, and to develop new or improved software or systems

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG527 Apply intermediate object-oriented language skills	ICAPRG527A Apply intermediate object-oriented language skills	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTPRG527 Apply intermediate object-oriented language skills

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design and build application programs from a problem scenario and program specification
- use object oriented programming language.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain data structures
- explain small-size and medium-size application development
- define object-oriented programming concepts
- define object-oriented programming language
- explain the process and techniques related to the use of a graphical user interface (GUI), to interact with an operator
- outline the techniques to document applications.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- the requirements document or object-oriented design structures
- programming languages that support object-oriented development
- the database management system (DBMS)
- the appropriate learning and assessment support

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG528 Perform ICT data conversion

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to translate information and communications technology (ICT) data from one format to another, by means of a data conversion process.

It applies to individuals in support and implementation roles who are required to convert data from one system to another.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare the system for conversion	1.1 Obtain the data stores that are subject to conversion 1.2 Protect and confirm backup solutions 1.3 Trial conversion work in an isolated environment, secure from the production system 1.4 Map and document, the required data fields from the old system to the new or upgraded system 1.5 Determine field validation requirements from conversion plans, including data field legal ranges 1.6 Determine the actions to be taken with the fields or records that are rejected by the conversion plan 1.7 Consult stakeholders on the creation of a conversion plan 1.8 Design the data conversion program modules from the conversion specifications 1.9 Code and test data conversion program modules, according to conversion specifications 1.10 Confirm data conversion and test the converted production data
2. Perform data conversion	2.1 Estimate and plan for conversion time 2.2 Prepare the production system for data conversion and take off-line 2.3 Undertake action to protect production data 2.4 Take action to ensure minimal disruption to client business requirements during the conversion process 2.5 Document the data rejected by conversion routines, and the reason for rejection 2.6 Execute the conversion program modules 2.7 Document the results of the conversion process, and report to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.5, 1.8, 1.9	• Interprets and analyses complex technical documentation
Writing	1.4, 2.5, 2.7	• Accurately records and completes documentation, according to organisational formats and protocols • Writes, and edits, documents to ensure the accuracy and consistency of information, and clarity of meaning
Interact with others	1.7, 2.7	• Liaises with others to check own understanding and ensure that the objective is being met
Get the work done	1.1, 1.2, 1.3, 1.4, 1.6, 1.8, 1.9, 1.10, 2.1, 2.2, 2.3, 2.4, 2.6	• Takes responsibility for planning, sequencing and prioritising tasks, in order to achieve the required outcomes • Uses a range of digital tools and sophisticated techniques to meet the desired outcomes • Identifies technical or conceptual issues, and applies analytical processes, to resolve these issues • Uses analytical and lateral thinking to review current practices, and develop new or improved software or systems

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG528 Perform ICT data conversion	ICAPRG528A Perform IT data conversion	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG528 Perform ICT data conversion

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define the inherent data requirements of both old and upgraded, or new systems
- remodel data to achieve successful conversion
- back up data prior to conversion
- effectively code conversion programs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain hardware and software products, including their general features and their capabilities
- explain data conversion tools and data modelling methodologies
- outline the conversion from legacy systems
- outline industry-accepted database management system (DBMS) modelling.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to the:

- analysis of the source data
- business quality assurance rules associated with data
- data mappings
- logic to convert the data
- plan of the conversion routines
- software development environment
- technical requirements
- data conversion plan
- appropriate learning and assessment support.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTPRG529 Apply testing techniques for software development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop test strategies and implement tests to assure the reliability and quality of an application.

It applies to individuals who are responsible for test plan preparation, execution and maintenance, the reporting of tests and defect management in an application. These individuals include quality assurance analysts, test analysts, testers, system testers, software testers, test leads and developers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and design the test	1.1 Analyse and review software development specifications 1.2 Determine the test context, scope, standard and methodology 1.3 Determine the test types and tools 1.4 Determine test input data requirements 1.5 Design the test plan, and test cases, using various test design techniques
2. Prepare the test environment	2.1 Analyse and review documents to prepare the test environment 2.2 Determine test environment requirements 2.3 Build and set up the test environment
3. Implement and execute the test	3.1 Build input data for testing 3.2 Create the test suite or script from test cases 3.3 Execute the test cases 3.4 Create the test record to store test result
4. Manage defect and testing process	4.1 Evaluate and report the test results 4.2 Track the defect and verify the fixes 4.3 Maintain and archive test ware

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1	• Reviews, and evaluates, technical and business requirements
Writing	4.1	• Develops the technical reports and documentation appropriate for the target audience
Get the work done	1.2, 1.3, 1.5, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.2, 4.3	• Takes responsibility for planning, sequencing and prioritising processes, and tasks, to achieve the required outcomes • Applies systematic and analytical problem-solving processes, to develop the appropriate security access control strategies • Uses a range of digital tools and sophisticated techniques to meet the desired outcomes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG529 Apply testing techniques for software development	ICAPRG529A Apply testing techniques for software development	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG529 Apply testing techniques for software development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a test-plan document and test cases, to verify the completeness, reliability and performance of an application, according to requirement specifications
- analyse and prepare the test environment, and execute test cases, by using automated test tools
- document and manage the test result, by performing an application debugging process, and re-testing the application.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the characteristics of the programming language
- explain the input and output requirements
- outline software development life cycle (SDLC) methodologies
- define system layers such as the data network, hardware, operating system, database management systems, web servers, application servers, and client deployment
- explain the processes and techniques related to small-size application development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the programming and software development industry, and include access to:

- a test environment that closely resembles the production environment
- business, functional, system and user requirements
- a system or application suitable for testing
- the appropriate learning and assessment support, when required

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTPRG601 Develop advanced mobile multi-touch applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, develop, debug, test and deploy applications, for hand-held digital devices using the advanced features of these devices.

It applies to individuals with information and communications technology (ICT) skills who work as mobile device application developers. They may be programmers, game developers, designers and testers, who are working in the area of mobile applications development.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Work effectively on the target platform	1.1 Review the requirements 1.2 Establish the platform 1.3 Install the required development tools, and environment 1.4 Use the available debugging tools and techniques 1.5 Deploy the completed applications on the target device, and for public download 1.6 Test the application using an emulator
2. Develop an application for a multi-touch device	2.1 Design and code the application, responding to events 2.2 Design and code the application, responding to taps, touches and gestures 2.3 Use a model view controller to design the approach 2.4 Develop the application, making effective use of auto-rotation and auto-resizing facilities
3. Develop the code using features of the mobile device	3.1 List the available features of the mobile device 3.2 Write code requiring web connectivity, and using web services 3.3 Write code that communicates with another device, using a communication protocol 3.4 Write code using an application programming interface (API) related to at least one other advanced device feature
4. Use available data persistence facilities	4.1 Write code, to read and write, to the devices file system 4.2 Use synchronisation techniques to synchronise data between the device and external data sources 4.3 Write code to make use of available database facilities, on the chosen device
5. Develop applications that are secure and stable	5.1 Determine and apply the performance objectives 5.2 Ensure memory management, using tools and techniques effectively 5.3 Use tools and techniques to evaluate performance 5.4 Eliminate zombies, using appropriate tools and techniques

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.3	• Identifies, analyses, and interprets complex technical and business protocol material in order to determine business requirements
Writing	3.1, 3.2, 3.3, 3.4, 4.1	• Develops complex and technical material, using industry-specific metalanguage that allows users to define their own customised markup languages for displaying documents on the world wide web (WWW)
Numeracy	2.2, 3.2	• Extracts, evaluates and manipulates the mathematical information embedded in a range of tasks and texts
Navigate the world of work	3.3	• Recognises and responds to both, explicit and implicit, protocols within familiar work contexts
Get the work done	1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 5.1, 5.2, 5.3, 5.4	• Demonstrates a sophisticated understanding of the principles, concepts, language and practices associated with the digital world, and uses these to troubleshoot, and understand the uses and potential of new technology • Is acutely aware of the importance of understanding, monitoring, and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences, and consider implementation issues, and contingencies • When dealing with complex issues, may use intuition to identify common problems in building, and deploying mobile applications, and completing basic program debugging

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG601 Develop advanced mobile multi-touch applications	ICAPRG601A Develop advanced mobile multi-touch applications	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTPRG601 Develop advanced mobile multi-touch applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design applications for small devices that allow multi-touch user input and have advanced mobile features
- build and test these applications
- deploy these applications onto mobile devices.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the hardware, and networking, requirements of a multi-touch application
- describe and apply object-oriented programming
- identify and describe user interface designs, and their application
- describe web design methodology and its integration with hand-held devices
- identify and describe typical mobile devices that use multi-touch technologies
- summarise extensible markup language (XML) programming, and web services
- describe techniques for developing software applications.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the programming and software development industry, and include access to:

- hand-held devices and simulators
- an integrated development environment (IDE)
- the internet and web services
- the server system, with sufficient privileges to deploy applications
- specific tools and licences, depending on the particular platform.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG602 Manage the development of technical solutions from business specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the process of compiling client business specifications, to produce business solutions for consideration.

It applies to individuals with the project management, business, and technical skills necessary to manage complex technology projects within the information and communications technology (ICT) industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Obtain the business requirements	1.1 Ensure that the business requirements and business specifications have been obtained from the client or the appropriate person 1.2 Manage the team's identification of the client's business model 1.3 Ensure that the technical specifications for the business problem have been determined 1.4 Manage the confirmation of key stakeholder requirements with stakeholders 1.5 Confirm the documentation of business objectives, technical requirements, and the problem
2. Evaluate the impact of the technical requirements	2.1 Review business problems, opportunities and objectives 2.2 Confirm that the technical requirements are complete 2.3 Review the hardware, software and network requirements 2.4 Coordinate the investigation into the processes to be changed by the business solution 2.5 Review the evaluation document, on the impact of the technical requirements on the business
3. Produce technical business solutions	3.1 Confirm the technical solutions produced in response to problems and business requirements 3.2 Review the costs involved in implementing the solutions 3.3 Review the recommendation from a range of supplier products, to determine which one best meets the technical requirements 3.4 Review, and report on, the technical solutions addressing the business specifications, and provide recommendations against the business requirements
4. Document and validate the agreed solutions	4.1 Ensure the report is forwarded to the appropriate person for feedback 4.2 Manage the feedback and incorporate changes, as required 4.3 Coordinate the redistribution of adjusted reports to the appropriate person 4.4 Obtain sign-off on the final business solution

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.5, 2.1, 2.2, 2.3, 2.5, 3.1, 3.4, 4.2	• Recognises, and interprets, complex technical and operational documentation, to determine and confirm job requirements
Writing	1.4, 4.2	• Develops a broad range of material including reports, design solutions, technical specifications and recommendations in required formats, for a specific audience, using clear and detailed language in order to convey explicit information, requirements, and recommendations
Oral Communication	1.3, 1.4, 4.2	• Articulates technically complex concepts and operational, and business-related, matters using the specific and relevant language suitable to the audience, and liaises with diverse personnel • Uses listening and questioning skills to confirm understanding for requirements
Numeracy	2.1, 2.5, 3.2	• Uses mathematical formulas and calculations to estimate and plan project costs
Interact with others	1.1, 1.2, 4.1, 4.3, 4.4	• Actively identifies the requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit the purpose and audience • Fosters a collaborative culture within own sphere of influence, facilitating a sense of commitment and cohesion, and highlighting, and using the strengths of those involved
Get the work done	1.1, 1.2, 2.3, 2.4, 3.1, 3.3	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot, and understand, the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information, recognising that design choices will influence what information is retrieved, and how it may be interpreted, and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate

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		alternative strategies, anticipate consequences, and consider implementation issues and contingencies • Uses a nuanced understanding of context to adapt varied business procedures to requirements, depending on operational contingencies, risk situations and environments

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTPRG602 Manage the development of technical solutions from business specifications	ICAPRG602A Manage the development of technical solutions from business specifications	Updated to meet Standards for Training Packages. Minor changes to the performance criteria for clarity.	Equivalent unit

Links

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Assessment Requirements for ICTPRG602 Manage the development of technical solutions from business specifications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- adapt technologies to specified technical solutions
- use site design software and hardware
- evaluate client specifications against accepted industry practices
- produce technical solutions from business specifications
- produce information that can be shared between businesses
- apply design concepts to business solutions
- produce technical reports
- make recommendations, and offer optimum design solutions.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the business processes for a project
- outline the client business domain, including the client organisation structure and business functionality
- explain compatibility issues and resolution procedures
- outline the configuration of internet protocol (IP) networks
- describe the importance of customer and business liaison
- summarise desktop applications and the operating system (OS), as required
- explain the procedures for linking processes
- outline project management methodologies and processes
- explain security protocols, standards and data encryption
- explain technologies, such as:
  - access networks
  - core networks
  - information and communications technology (ICT) network topologies
  - mobile cellular networks
  - network protocols and OS
  - optical networks and principles
  - radio frequency (RF) networks and principles
  - radio frequency identification (RFID) hardware and software
- describe the development platform that provides the tools to build, and deploy, applications into target platform environments.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the programming and software development industry, and include access to:

- the client's functional requirements
- business specifications
- the database and simulation software
- organisational guidelines
- the network or computer layout
- site-design software and hardware
- information on a range of ICT business solutions.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTPRG604 Create cloud computing services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, build, test and deploy web services and cloud computing applications to specifications.

It applies to individuals, in computer programmer roles, with the information and communications technology (ICT) skills required to create and install web services and cloud computing applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design web service or cloud computing application	1.1 Gather requirements for the web service or cloud computing application 1.2 Determine the development environment and tools required to create web service or cloud computing application 1.3 Identify any possible big data applications 1.4 Define architecture and framework
2. Build web service	2.1 Itemise required functionality 2.2 Build web service in the determined environment to meet required functionality
3. Build cloud computing application	3.1 Determine required functionality 3.2 Build cloud computing application in the determined environment to meet the required functionality
4. Test web service or cloud computing application	4.1 Test web service or cloud computing application for overall functionality according to requirements 4.2 Iterate design or build until test results meet requirements
5. Deploy web service or cloud computing application	5.1 Deploy web service or cloud computing application to the specified environment 5.2 Publish web service or cloud computing application to the specified environment

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1, 4.1	• Recognises and interprets complex technical and operational documentation to determine and confirm job requirements
Writing	1.3, 1.4, 2.1, 3.2, 4.2, 5.1, 5.2	• Develops complex documentation in required formats using clear and detailed language to convey explicit information, requirements and recommendations • Writes and edits computer code and technical data ensuring correct syntax
Oral Communication	1.1	• Uses listening and questioning skills to confirm understanding for requirements • Articulates technically complex concepts and operational and business-related matters using specific and relevant language suitable to audience
Get the work done	1.1, 1.2, 1.3, 1.4, 2.2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.2	• Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to troubleshoot and understands the uses and potential of new technology • Uses a broad range of strategies to store, access and organise virtual information recognising that design choices will influence what information is retrieved and how it may be interpreted and used • Is acutely aware of the importance of understanding, monitoring and controlling access to digitally stored and transmitted information • Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies • Uses understanding of context to address common problems in operating a web service or cloud computing application and performs basic debugging when required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG604 Create cloud computing services	ICAPRG603A Create cloud computing services	Updated to meet Standards for Training Packages. Recoded and minor changes to PCs to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTPRG604 Create cloud computing services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, build, test and deploy a web service to specification that can be accessed and used from a separate web application
- design, build, test and deploy a cloud computing application to specification that can be accessed from a variety of portals
- document the completed development.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe the development tools required to produce services deployable through cloud computing
- summarise the internet infrastructure necessary for cloud computing
- describe object-oriented programming and its application to cloud computing
- describe database access and manipulation on the web using:
  - hypertext markup language (HTML)
  - eXtensible markup language (XML)
- describe the term "big data" and explain its relevance to cloud computing.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the programming and software development industry and include access to:

- specific requirements, including client and functionality requirements
- integrated development environment (IDE) for the determined language
- the database server with tools to access data source and develop queries
- the web server for the determined environment
- the internet and a web browser.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTRFN801 Produce a radio link budget

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse technical performance of fixed and mobile radio systems, and plan and calculate link budgets.

It applies to individuals working as telecommunications engineers who take responsibility for establishing layout of a digital radio system to minimise transmission loss and optimise system performance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Radio Frequency Networks

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Critically analyse suitability of radio systems	1.1 Critically analyse spectral efficiency of functional elements of mobile radio systems for determining optimal frequency utilisation 1.2 Critically analyse features of radio systems to evaluate effectiveness of a particular application 1.3 Compare features and specifications of antennas used in radio systems to assist with radio link budget 1.4 Report on suitability of radio systems, including recommendations to improve network performance
2. Calculate a radio link budget	2.1 Calculate path loss using variables in appropriate propagation models for a power link budget 2.2 Evaluate power link budget against allowable power margin specifications 2.3 Evaluate modulation types and spectral efficiency 2.4 Confirm radio power link budget achieves specified reliability
3. Complete evaluation and planning documentations	3.1 Complete an evaluation report on performance of radio systems with recommendations on system improvements 3.2 Document processes used to determine optimal power link budget for a radio system

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.4, 3.1, 3.2	• Uses clear, specific and industry-related terminology to complete and update specific workplace documentation and when presenting recommendations to relevant personnel
Oral Communication	1.4	• Liaises with personnel about technical, operational and commercial matters using specific and relevant language, using listening and questioning techniques to confirm understanding
Numeracy	2.1, 2.2, 2.4	• Analyses, synthesises and performs calculations using highly embedded mathematical information in a broad range of tasks and texts
Get the work done	1.1-1.3, 2.1-2.3	• Determines job priorities and works logically and systematically to undertake clearly defined and familiar tasks • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and understands potential of new technology • Uses systematic, analytical processes in complex situations, gathering relevant information and identifying and evaluating options against predetermined criteria • Diagnoses faults in different situations, adapts procedures and modifies activities depending on operational contingencies, risk situations and environments

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTRFN801 Produce a radio link budget	ICTRFN7182B Produce a radio link budget	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTRFN801 Produce a radio link budget

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse signal degradation characteristics of radio paths and calculate power budgets for various distances and antenna heights versus transmitted power
- research constraints imposed by mobile phone frequency allocations and simulate carrier to interference radiation patterns around a cell site
- create evaluation report on radio system performance
- document processes used to determine power link budget.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain high frequency (HF), very high frequency (VHF), ultra high frequency (UHF) and microwave receiving techniques
- summarise modulation methods:
  - AM
  - FM
  - digital
- outline multiplexing systems
- summarise operation of transmitters and receivers
- explain organisational policies and procedures
- summarise personal safety issues
- explain propagation methods
- summarise radio communications systems
- weigh factors affecting radio frequency (RF) path loss
- summarise RF technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Radio Frequency Networks industry and include access to:

- a telecommunications operations site
- mobile telephony devices and equipment
- networked computers and relevant software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAD401 Develop and present feasibility reports

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research and analyse potential system solutions and present a feasibility report to the client.

It applies to individuals required to investigate potential solutions within the context of an information and communications technology (ICT) project.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements	1.1 Analyse client requirements to determine project scope and the problem or opportunity faced by the business 1.2 Document client requirements, project scope, related problems and sources of information 1.3 Confirm requirements and scope with the client
2. Develop high-level alternative scenarios	2.1 Compare future client requirements with current requirements 2.2 Develop and document feasible solutions for client requirements 2.3 Explore and document the feasibility of each solution 2.4 Examine alternatives against project constraints
3. Prepare and publish feasibility report	3.1 Develop a feasibility report that describes client requirements and project scope, analyses alternative scenarios, and provides recommendations 3.2 Submit feasibility report to appropriate person for project approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.4	• Reads and interprets specifications and other documentation from a variety of sources, and consolidates information to determine client requirements
Writing	1.2, 1.3, 2.2, 2.3, 3.1	• Prepares and produces a document that conveys complex relationships between alternative solutions to achieve business outcomes • Uses technical report format and terminology appropriate to the stakeholders
Oral Communication	1.3	• Determines and confirms client requirements, using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Numeracy	2.1-2.4, 3.1	• Applies financial modelling skills to identify, analyse and evaluate budgetary information, time durations and human resource allocations
Interact with others	1.3, 3.2	• Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships
Get the work done	1.1, 2.1, 2.2, 2.4, 3.1	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation, and formal and analytical thinking • Uses and investigates new digital technologies and applications to manage and manipulate data, and communicate effectively with others in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD401 Develop and present feasibility reports	ICASAD401A Develop and present feasibility reports	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD401 Develop and present feasibility reports

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and confirm services required
- document the project scope
- develop solutions to client's requirements that fit within the constraints
- document the feasibility report according to requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the client business domain
- outline the system's current functionality
- explain the role of stakeholders and the degree of stakeholder involvement
- describe and compare TWO or more current industry systems development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- client requirements
- report writing template
- client expectations brief
- information on a range of information and communications technology (ICT) business solutions
- future organisational business processes
- budgets for scenarios
- outcomes of the business analysis process.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD501 Model data objects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to understand business operations, identify entities and data, diagrammatically represent their relationships, and prepare a data model.

It applies individuals who have a broad range of analytical, technical and communication skills and who work within broad but established parameters.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify entities and relationships	1.1 Analyse business data to understand operations 1.2 Identify boundaries of the system 1.3 Identify entities, attributes, data types and relationships of data 1.4 Review business rules to determine impact 1.5 Document relationships in an entity relationship diagram
2. Develop normalisation	2.1 Identify suitable business data 2.2 Undertake normalisation of business data and document results 2.3 Compare normalisation results with entity relationship diagram 2.4 Reconcile differences between data
3. Validate model	3.1 Validate data model with client 3.2 Resolve issues or recommendations 3.3 Document completed data model 3.4 Submit to client for final approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.3, 2.4	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.5, 2.2, 2.4, 3.3, 3.4	• Prepares and produces diagrammatic models and associated documents that convey complex relationships between data • Documents outcomes and changes to discussions, using industry relevant terminology and recognised symbols
Oral Communication	3.1-3.4	• Participates in verbal exchanges by listening and questioning clients to elicit information, resolve issues, and obtain final product and work outcome approval
Interact with others	3.1, 3.2, 3.4	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Elicits feedback and provides feedback to others
Get the work done	1.1-1.4, 2.1, 3.2, 3.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision making processes for complex and non-routine situations • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD501 Model data objects	ICASAD501A Model data objects	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTSAD501 Model data objects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document client business requirements
- construct an entity relationship diagram
- construct and document a data model
- normalise the model
- validate the model.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- fully describe:
  - database identifiers and their impact on database usability
  - normalisation rules and processes
  - type hierarchies, including sub-types, super-types and root-types related to development of structured data types
  - validation procedures and processes
- describe the function and features of:
  - an approach to data modelling, such as the entity-relationship model
  - keys, e.g. unique keys, composite keys, primary keys and primary index
  - time stamps related to the use of keys
  - user defined types, structured types, reference types and user defined functions
  - data types and their application
- summarise the particular business domain.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- client's business requirements
- special purpose tools, equipment and materials
- industry software packages
- computer aided software engineering (CASE) tools
- entity relationship diagrams.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAD502 Model data processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to gather process data and business information in order to model data processes within an organisation.

It applies to individuals who can apply a broad range of technical knowledge and skills within the context of a complex project.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop scope of model	1.1 Identify relevant data processes and sources of information 1.2 Identify information gathering method and modelling methodology to be used 1.3 Document modelling information gathered 1.4 Validate modelling information with client
2. Gather process data	2.1 Identify business functions and collect process data using chosen method 2.2 Identify external events, procedures and results 2.3 Identify processes and required decomposition
3. Develop and validate data model	3.1 Model process data according to modelling methodology 3.2 Validate process model with client to determine inaccuracies 3.3 Incorporate identified changes, as required 3.4 Review business rules to determine impact on process models and change as required 3.5 Validate completed process models with client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.3, 3.4	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.3, 1.4, 3.3-3.5	• Prepares and produces diagrammatic models and associated documents that convey complex relationships between data
Oral Communication	1.4, 3.2, 3.5	• Determines and confirms client requirements using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and confirm understanding
Interact with others	1.4, 3.2, 3.5	• Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships
Get the work done	1.1, 1.2, 2.1-2.3, 3.1, 3.4	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision making processes for complex and non-routine situations • Uses and investigates new digital technologies and applications to manage and manipulate data, and communicate effectively with others in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD502 Model data processes	ICASAD502A Model data processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTSAD502 Model data processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify data processes that represent the client's business reality
- model data processes according to industry and organisation standards
- complete documentation of the data model.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss modelling rules and conventions with reference to naming processes and events
- outline features and functions of process mappers
- explain features of data analysis, particularly in determining process flows
- describe processes and techniques, using logical design concepts related to designing process models.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- client’s business requirements
- special purpose tools and equipment
- industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSAD503 Minimise risk of new technologies to business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify and plan to minimise the business and technological risks associated with business solutions that utilise new technologies.

It applies to individuals who are responsible for performing complex technical analysis to provide solutions to complex problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish the risk context	1.1 Review organisational and technical environment and proposed business solution 1.2 Identify scale, importance and complexity of project risks 1.3 Establish acceptable and unacceptable levels of risk and consequences for the solution 1.4 Identify the impact of risks against the business environment 1.5 Determine and document proposed actions to insure against identified generic risks
2. Conduct risk analysis	2.1 Conduct a risk analysis to determine the likelihood of risks identified 2.2 Rank risk factors according to the impact and likelihood of occurrence 2.3 Develop contingency plans to mitigate identified risks 2.4 Document risk analysis and contingencies in a risk management plan 2.5 Implement risk management plans and undertake awareness training to inform stakeholders
3. Monitor risks	3.1 Establish feedback channels to warn of unforeseen and identified risks 3.2 Conduct regular reviews to identify new risks and update established risks 3.3 Document changes to risk management plans as appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 3.2	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.5, 2.1, 2.3, 2.4, 3.3	• Prepares documentation that expresses ideas, explores complex issues and is constructed logically, succinctly and accurately
Navigate the world of work	1.4	• Seeks to improve policies and procedures to better meet organisational goals and mitigate risk
Interact with others	2.5, 3.1, 3.2	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Elicits feedback and provides feedback to others
Get the work done	1.2-1.5, 2.1-2.5	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision making processes for complex and non-routine situations • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation, and formal and analytical thinking • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTSAD503 Minimise risk of new technologies to business solutions	ICASAD503A Minimise risk of new technologies to business solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD503 Minimise risk of new technologies to business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop procedures that identify where risk occurs
- identify measures to be taken to treat the risk
- document a risk management plan
- implement risk management plan
- establish a risk review procedure.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline business process design
- explain business supply chain
- describe copyright and intellectual property relating to new technologies
- identify and describe how business sites fit into corporate strategy
- explain the purpose of user analysis and customer relationship management software
- describe risk management process and planning strategies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- analysis software
- business website
- customer relationship model
- requirements documentation
- site server and software
- updated or new technology
- user analysis
- web servers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAD504 Implement quality assurance processes for business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to define and implement quality assurance processes and procedures to ensure that business solutions achieve quality performance expectations.

It applies to senior information and communications technology (ICT) staff in a range of areas that are required to ensure quality in ICT systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan business quality assurance process	1.1 Determine business quality performance expectations and benchmark standards 1.2 Develop business standards and guidelines for achieving each benchmark 1.3 Allocate strategic quality responsibilities for meeting business standards and guidelines according to business procedures 1.4 Document expectations, standards and benchmarks in a quality plan based on business documentation standards 1.5 Identify appropriate quality management systems guides, including quality management plan for complex activities 1.6 Communicate quality policy and procedures to appropriate stakeholders
2. Implement quality policies and plans	2.1 Write quality policy for business directive 2.2 Create quality management plan for business solution 2.3 Distribute quality management plan to key people for feedback 2.4 Analyse feedback to determine if corrective action needs to be taken 2.5 Make changes to quality management plan, if required, to incorporate corrective action 2.6 Allocate key quality tasks and functions to appropriate person as per the quality management plan 2.7 Establish and document a quality reporting and monitoring program 2.8 Check and document skills of staff to ensure that they are able to meet the quality standards required
3. Control quality assurance processes	3.1 Implement quality performance guidelines, procedures and processes as per the quality management plan 3.2 Obtain stakeholder feedback, including client satisfaction to monitor implementation of quality processes 3.3 Monitor quality process performance as per the quality management plan 3.4 Report on monitoring of quality performance to key decision makers

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ELEMENT	PERFORMANCE CRITERIA
	3.5 Identify and record breakdowns in the system and create corrective action requests 3.6 Take immediate corrective action, where necessary
4. Improve quality	4.1 Collect, analyse and measure quality performance results against benchmarks to determine if quality standards are being met 4.2 Determine the frequency of quality breakdowns through corrective action requests in order to identify whether defects are isolated incidents or require a wider analysis and corrective action 4.3 Determine corrective actions to be taken and assign responsibility for taking the action where appropriate 4.4 Identify who will be responsible for quality improvement 4.5 Implement corrective action solutions and measure performance 4.6 Review and adjust benchmark standards periodically in order to improve quality performance 4.7 Document quality performance results and disseminate the information to stakeholders as appropriate 4.8 Review business procedures at predetermined schedules as part of a management review process and quality reporting function

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.6, 3.5, 4.1, 4.6, 4.8	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.1, 1.2, 1.5, 2.1, 2.2, 2.5, 2.7, 2.8, 3.4, 4.6, 4.7	• Accurately records information and prepares correspondence and documentation using clear language and organisational formats and protocols • Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information
Oral Communication	1.4, 3.4, 4.7	• Uses collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Navigate the world of work	1.1-1.3, 1.5, 2.1, 2.5, 2.6, 3.1, 3.3, 4.8	• Modifies or develops organisational policies and procedures to comply with legislative requirements and organisation goals • Seeks to improve policies and procedures to better meet organisational goals • Contributes to roles and responsibilities of self and others
Interact with others	1.3, 1.4, 2.3, 2.6, 2.8, 3.2, 3.4, 3.5, 4.3, 4.4, 4.7	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Implements strategies for a diverse range of colleagues and clients in order to build rapport and foster strong relationships • Elicits feedback and provides feedback to others in order to improve self or workgroup behaviours
Get the work done	1.2-1.3, 2.2, 2.4, 2.7, 3.1-3.3, 3.5, 3.6, 4.1-4.8	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews and changes them to meet new demands and priorities • Responds intuitively to problems requiring immediate resolution, drawing on past experiences to focus on the cause of a problem rather than the symptom

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		• Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation, and formal and analytical thinking • Uses and investigates new digital technologies and applications to manage and manipulate data, and communicate effectively with others in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD504 Implement quality assurance processes for business solutions	ICASAD504A Implement quality assurance processes for business solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD504 Implement quality assurance processes for business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and implement appropriate processes and procedures to ensure quality expectations are met
- constructs quality standards that can be measured quantitatively and applied universally
- document quality assurance standards
- monitor and review quality assurance standards and processes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain copyright and intellectual property relating to information and communications technology (ICT) systems development
- outline features of business models
- explain the relevance to the development of quality assurance and quality management plans of:
  - International Organization for Standardization (ISO)
  - International Electrotechnical Commission (IEC) standards
  - Australian Standards (AS)
- describe quality concepts applied to ICT
- outline quality improvement processes
- explain techniques of technical performance measurement
- explain the implications of website architecture, including operating system on:
  - privacy
  - accessibility
  - equity
- describe the structure of a quality assurance management plan and list the standards that may be included.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- relevant quality standards
- data related to the business model
- organisational guidelines that apply to quality standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD505 Develop technical requirements for business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the outcomes, skills and knowledge required to develop technical and related requirements that will enable business solutions to be implemented in an organisation.

It applies to individuals who are responsible for performing complex technical analysis to complete a range of tasks and provide solutions to complex problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research business requirements	1.1 Define hardware and software requirements of the business solution 1.2 Determine model of business 1.3 Determine technical specifications for business 1.4 Establish interface requirements for end users and external parties 1.5 Document business solution requirements for approval from stakeholders 1.6 Determine information and communications technology (ICT) security requirements
2. Analyse the impact of technical solutions	2.1 Identify hardware, software and network requirements 2.2 Identify software solutions to build business platform 2.3 Identify processes to be changed by the business solution 2.4 Determine the effect changes will have on the value or supply chain 2.5 Research a range of security protocols suitable for business solutions 2.6 Document impact of changes and submit to relevant stakeholders
3. Develop and test business solutions	3.1 Implement hardware and software solutions for testing purposes 3.2 Identify training needs to update personnel skills 3.3 Plan timelines and allocation of resources for business solution 3.4 Develop performance standards and benchmark results 3.5 Determine costs involved to implement business solution 3.6 Document the business solution
4. Secure sign-off of validated solution	4.1 Test, validate and document results of the business solution 4.2 Provide results to appropriate person for verification 4.3 Obtain sign-off on business solution

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 1.6, 2.1-2.4	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.5, 2.6, 3.4, 3.6, 4.1	• Accurately records and completes organisational documents and correspondence, using clear language and correct spelling, grammar and terminology • Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information
Numeracy	3.5	• Performs mathematical calculations to analyse financial information, costs and values to accurately determine cost of implementation
Navigate the world of work	2.3, 3.2	• Seeks to improve policies and procedures to better meet organisational goals • Contributes to roles and responsibilities of self and others
Interact with others	1.5, 2.6, 4.2, 4.3	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Implements strategies for a diverse range of colleagues and clients in order to build rapport and foster strong relationships
Get the work done	1.1-1.4, 1.6, 2.1-2.5, 3.1-3.4, 4.1, 4.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews and changes them to meet new demands and priorities • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation, and formal and analytical thinking • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD505 Develop technical requirements for business solutions	ICASAD505A Develop technical requirements for business solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD505 Develop technical requirements for business solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document the internal and external technical environments required to provide a business solution
- produce a list of technical requirements
- produce an impact statement of the technical solution
- evaluate the functionality of the business solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline business process design
- list copyright and intellectual property relating to information and communications technology (ICT) systems development
- explain the customer and business liaison processes
- describe the implications of technology connectivity
- list and describe the potential business solutions
- explain the prevailing corporate strategies that may influence business solutions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- business model
- business requirements documentation
- customer relationship model
- hardware, software and network requirements
- software solutions to build business platform
- processes to be changed by the business solution
- security protocols suitable for business solutions
- special purpose tools, equipment, materials and industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD506 Produce a feasibility report

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to recommend the preferred scenario from a range of feasible options offered to the client.

It applies to individuals who are responsible for researching, planning and designing solutions for complex information and communications technology (ICT) projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements	1.1 Confirm client requirements to determine project scope and the problem context or opportunity faced by the business 1.2 Review documented client requirements, project scope, related problems and sources of information 1.3 Confirm requirements and scope with the client
2. Examine and review alternatives	2.1 Ensure that future client requirements are considered 2.2 Research and document feasible solutions for client requirements 2.3 Ensure that the feasibility of each solution has been assessed, including constraints
3. Prepare and publish feasibility report	3.1 Prepare a feasibility report 3.2 Ensure that the completed feasibility report covers client requirements, project scope and analysis of alternative scenarios 3.3 Confirm the recommendation of the preferred scenario 3.4 Present feasibility report to appropriate person for project approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.2, 3.2	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	2.2, 3.1	• Writes, edits and proofreads reports to ensure clarity of meaning, and accuracy and consistency of information • Accurately records and completes organisational documents and correspondence using clear language and correct spelling, grammar and terminology
Oral Communication	1.1, 1.3, 3.3, 3.4	• Uses collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Interact with others	1.1, 1.3, 2.1, 3.4	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Elicits feedback and provides feedback to others • Recognises the diversity in people and manages this diversity to improve workplace relations and practices
Get the work done	2.1-2.3, 3.1-3.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews and changes them to meet new demands and priorities • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation, and formal and analytical thinking

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD506 Produce a feasibility report	ICASAD506A Produce a feasibility report	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD506 Produce a feasibility report

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review documentation and confirm client requirements for the project
- confirm the scope with the client
- document alternative solutions for the project
- prepare a feasibility report ensuring it meets client requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain and list the client requirements
- describe the role of stakeholders and the degree of stakeholder involvement in developing a feasibility report
- list the system's current functionality and improvement options
- outline TWO or more current industry systems development methodologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- contributions to a feasibility report
- client requirements
- report writing template
- client expectations brief
- information on a range of information and communications technology (ICT) business solutions
- future organisational business processes
- budgets for scenarios
- outcomes of the business analysis process
- financial modelling
- business context
- use of special purpose tools, equipment, materials and industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAD601 Perform ICT-focused enterprise analysis

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide an enterprise analysis and determine the possible information and communications technology (ICT) solutions available for a given initiative or for long-term planning.

It applies to individuals who combine high-level management, business and technical skills necessary to manage complex analysis efforts within the ICT industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define business need	1.1 Analyse business goals and objectives, and link to measures to allow objective assessment of achievement 1.2 Investigate issues to determine the business problem or opportunity 1.3 Identify possible ICT solutions to the business problem 1.4 Determine desired outcomes to enable evaluation of proposed solutions
2. Assess capability gaps	2.1 Determine current capabilities of the enterprise and relate to the desired objectives 2.2 Identify new capabilities required to achieve the desired future state and assess gaps 2.3 Test assumptions to facilitate appropriate decision making
3. Determine solution approach	3.1 Generate potential ICT options to meet the business objectives 3.2 Generate valid assumptions and recognise constraints that may affect the choice of solutions 3.3 Assess and rank solution approaches to facilitate selection
4. Define solution scope	4.1 Define solution scope in terms of the major features or functions to be included 4.2 Explain the implementation approach in terms of how the chosen solution will deliver the solution scope 4.3 Delineate major business and technical dependencies
5. Define business case	5.1 Identify benefits of the recommended solution in terms of both qualitative and quantitative gains to the enterprise 5.2 Estimate the total net cost of the solution 5.3 Perform initial risk assessment 5.4 Agree how identified costs and benefits will be assessed and evaluated

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.3, 3.3, 4.3	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.1-1.4, 2.1-2.3, 3.1-3.3, 4.1-4.3, 5.1-5.4	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information • Prepares documentation that expresses ideas, explores complex issues and is constructed logically, succinctly and accurately
Numeracy	5.1-5.3	• Uses highly developed numeracy skills to interpret complex financial information and perform calculations to make estimates of costs
Navigate the world of work	1.1, 2.1, 4.1, 4.2	• Works autonomously, making high-level decisions to achieve and improve organisational goals • Takes a lead role in the development of organisational goals, roles and responsibilities • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are met
Interact with others	5.4	• Selects, implements and manipulates communications systems, processes and practices for maximum impact
Get the work done	1.2-1.4, 2.1-2.3, 3.1-3.3, 4.2, 4.3, 5.1, 5.3, 5.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data, and seeks feedback to improve plans and processes • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision making strategies where appropriate • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD601 Perform ICT-focused enterprise analysis	ICASAD601A Perform IT-focused enterprise analysis	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD601 Perform ICT-focused enterprise analysis

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- examine in detail a business situation and document a comprehensive business case for a proposed solution that addresses:
  - business need
  - required capabilities
  - solution scope
  - risk assessment
  - cost estimates
  - most feasible approach.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the business analysis processes, procedures and techniques
- discuss market trends and best practices to assist in identifying business opportunities
- explain technology and technology solution patterns.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- appropriate policies
- current business analysis practices and tools
- legislation
- reports and plans prepared for projects.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAD602 Conduct knowledge audits

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to conduct a knowledge management audit.

It applies to individuals in senior management positions who are responsible for high-level analysis of organisational strategies and practices.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Conduct a knowledge needs analysis	1.1 Identify current and future directions of the business 1.2 Identify knowledge and skills required to support the current business activities 1.3 Identify knowledge and skills required to support future business directions
2. Analyse the knowledge inventory	2.1 Produce knowledge questionnaires to request information from staff about corporate knowledge 2.2 Identify explicit knowledge currently resident in data sources, such as policies, procedures, databases and libraries, and record its location 2.3 Identify the accessibility, aim and integrity of the knowledge 2.4 Identify the frequency of update of this knowledge, its previous versions, and its backup status 2.5 Identify implicit knowledge currently resident in informal sources and organisational knowledge
3. Chart the knowledge flow	3.1 Examine how knowledge flows from one data store to another within the organisation, and how this flow is facilitated or impeded by policies, such as access control or records management policies 3.2 Examine the procedures that facilitate the flow of knowledge within the organisation and their ease of use 3.3 Identify the corporate and individual attitudes to knowledge within the organisation
4. Produce a knowledge audit report	4.1 Analyse the results of the knowledge audit 4.2 Document findings and present to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 2.4, 2.5, 3.2, 4.1	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	2.1, 4.2	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information • Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately
Navigate the world of work	2.2, 3.1-3.3	• Takes a lead role in the development of organisational goals, roles and responsibilities • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	3.3, 4.2	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Develops and implements communications strategies with internal and external persons in order to build rapport • Influences and fosters a collaborative culture, facilitating a sense of commitment and workplace cohesion
Get the work done	1.1-1.3, 2.3-2.5, 3.1, 3.3, 4.1	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Makes high-impact decisions in a complex and diverse environment, using input from a range of sources • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD602 Conduct knowledge audits	ICASAD602A Conduct knowledge audits	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD602 Conduct knowledge audits

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- document the identified explicit and implicit knowledge in an organisation
- establish and record the knowledge required to meet current needs
- establish and record the forecast knowledge required to meet future needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how the organisation's business, policies, procedures and structure influence corporate knowledge
- describe the difference between implicit and explicit knowledge
- analyse and identify concepts of risk management planning and processes
- explain the requirements for the design and development of questionnaires and the procedures for analysis of completed questionnaires
- explain the reporting mechanisms that influence a knowledge audit
- describe the key tools and models of project management.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- an organisation
- data sources and staff
- relevant tools, equipment and materials
- relevant industry software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD603 Plan and monitor business analysis activities in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish and manage information and communications technology (ICT) business analysis activities in a medium-to-large organisation.

This unit applies to individuals who require high-level management, business and technical skills to manage complex analysis efforts within the information and communications technology (ICT) industry, often as part of business critical ICT projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan business analysis approach	1.1 Establish organisational process needs and objectives that apply to the initiative, and if necessary, define the requirements that the process must meet 1.2 Review existing organisational standards, including standards, guidelines and processes relating to the current initiative 1.3 Tailor an approach to the needs of a specific business analysis initiative, according to organisational standards if required 1.4 Engage with the appropriate stakeholders to determine how the work will be completed 1.5 Plan the execution of business activities
2. Conduct stakeholder analysis	2.1 Recognise stakeholders who may be affected by the business need or a new solution 2.2 Assess stakeholder attitudes toward, and influence over, the initiative 2.3 Decide which stakeholders will have authority over business analysis activities 2.4 Instigate regular reviews to identify new stakeholders or changed positions as clarity of business needs evolve
3. Plan business analysis activities	3.1 Decide the type of project or initiative and the business analysis deliverables 3.2 Determine the scope of work for business analysis activities 3.3 Approve which activities the business analyst will perform and when 3.4 Develop estimates for business analysis work
4. Plan business analysis communication	4.1 Determine how best to receive, distribute, access, update and escalate information from project stakeholders 4.2 Decide how best to communicate with each stakeholder according to stakeholder needs and constraints to communication
5. Plan requirements management process	5.1 Establish a requirements repository for storing requirements, including those under development, those under review, and approved requirements 5.2 Assess the need and process for requirements traceability,

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ELEMENT	PERFORMANCE CRITERIA
	based on relevant factors 5.3 Conclude which requirements attributes will be captured 5.4 Determine the process for requirements change management
6. Manage business analysis performance	6.1 Determine which metrics will be used to measure the work performed by the business analyst 6.2 Report performance in an appropriate format, based on the needs of the project 6.3 Assess performance measures to determine where problems may be occurring in executing business analysis activities 6.4 Identify preventative or corrective actions as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 6.3	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.1, 2.2, 5.1, 6.2	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information • Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately
Oral Communication	2.2	• Determines and confirms stakeholder requirements, using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Numeracy	3.4	• Performs mathematical calculations to analyse financial information, costs and values to accurately determine estimates
Navigate the world of work	1.2, 1.3	• Works autonomously, making high-level decisions to achieve and improve organisational goals • Takes a lead role in the development of organisational goals, roles and responsibilities • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	1.4, 2.1, 2.2, 2.4, 3.3, 4.2	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Develops and implements communications strategies with internal and external stakeholders in order to build rapport and achieve desired outcomes
Get the work done	1.1, 1.3, 1.5, 2.1, 2.4, 3.1-3.3, 4.1, 4.2, 5.1-5.4, 6.1, 6.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision making strategies where appropriate

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAD603 Plan and monitor business analysis activities in an ICT environment	ICASAD603A Plan and monitor business analysis activities in an IT environment	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD603 Plan and monitor business analysis activities in an ICT environment

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan and monitor business analysis activities, including determining an approach and processes that are appropriate to the circumstances
- determine business analysis deliverables, tasks and estimates
- plan business analysis communications
- determine metrics for monitoring business analysis work
- assess business performance and identify measures to rectify.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the business analysis process, procedures and techniques
- describe project management process, procedures and techniques
- identify and apply risk management strategies
- overview technology and technology solution patterns
- describe communication constraints that may impact on stakeholders.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- special purpose materials
- industry software packages.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAD604 Manage and communicate ICT solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage and communicate requirements for new information and communications technology (ICT) systems to a broad and diverse audience.

This unit applies to individuals who require high-level management, business and technical skills to manage complex analysis within the information and communications technology (ICT) industry, often as part of business critical ICT projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Manage identified client ICT requirements and scope of solution	1.1 Establish baseline client ICT requirements and change control processes to track changes to requirements and solution scope 1.2 Resolve issues and conflicts that emerge during final stages of identifying and analysing requirements 1.3 Determine how requirements will be presented for review 1.4 Secure approval of requirements from those stakeholders who have the appropriate authority
2. Manage requirement relationships and dependencies	2.1 Examine and organise the set of requirements and record the dependencies and relationships for each 2.2 Perform impact analysis to assess or evaluate the impact of a change 2.3 Deploy requirements management tools as necessary
3. Maintain requirements for re-use	3.1 Identify requirements that the organisation will use in the long term 3.2 Name and define requirements available for future re-use
4. Prepare requirements package	4.1 Decide which formats are appropriate for a particular project and its stakeholders 4.2 Prepare requirements package according to organisational need

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.4, 2.1, 3.2, 4.2, 5.1, 5.2	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information • Prepares documentation and correspondence using clear language, correct spelling and terminology, and ensuring accuracy of information
Oral Communication	1.4, 5.1, 5.2	• Uses collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Navigate the world of work	4.2, 5.2	• Works autonomously, making high-level decisions to achieve and improve organisational goals • Develops and implements strategies that ensure organisational policies and procedures are being met
Interact with others	1.2, 1.4, 5.1, 5.2	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Influences and fosters a collaborative culture, facilitating a sense of commitment and workplace cohesion • Shares knowledge, information and experience openly as an integral part of the working relationship • Recognises potential for conflict and, working with others, seeks to develop organisational processes to deal with conflict
Get the work done	1.1-1.3, 2.1-2.3, 3.1, 3.2, 4.1	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision making strategies where appropriate • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to

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		develop and improve the organisation's goals

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD604 Manage and communicate ICT solutions	ICASAD604A Manage and communicate IT solutions	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD604 Manage and communicate ICT solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish processes to:
  - trace requirements
  - control and track changes to requirements
  - scope solutions
- manage requirement relationships
- package and communicate requirements according to what is appropriate for a project or stakeholder group.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain conflict resolution and issue management techniques to handle possible changes to solution scope
- outline requirements management and traceability processes
- list and apply techniques for managing version control and configuration.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- a simulated or workplace project in a medium-to-large enterprise
- observation of the candidate carrying out business analysis work
- reports and plans prepared for the projects
- a portfolio of the project work to be undertaken.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD605 Elicit ICT requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the outcomes, skills and knowledge required to undertake and engage stakeholders in the key task of defining information and communications technology (ICT) requirements.

This unit applies to individuals required to ensure that requirements elicited are complete, clear, correct and consistent, and can serve as a solid foundation for the solution to the business needs.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for elicitation	1.1 Define the specific activities and the planned dates for a particular elicitation activity 1.2 Build a detailed schedule 1.3 Communicate the plan to affected parties
2. Conduct elicitation activity	2.1 Conduct elicitation activity 2.2 Monitor captured requirements against business objectives to prevent scope creep 2.3 Capture and document requirements attributes 2.4 Update process metrics as the basis for future planning
3. Document elicitation results	3.1 Record elicitation outcomes in the appropriate form 3.2 Present elicitation outcomes to stakeholders and obtain agreement
4. Confirm elicitation results	4.1 Review the documented outputs with the stakeholders 4.2 Confirm that own understanding reflects stakeholder intentions and preferences

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.3, 4.1	• Analyses and consolidates information and data from a range of sources against defined criteria and requirements, and checks for accuracy and completeness
Writing	1.1, 1.3, 2.3, 2.4, 3.1, 3.2	• Accurately records information and prepares correspondence and documentation using clear language and organisational formats and protocols • Records outcomes of discussions
Oral Communication	1.3, 2.1, 3.2, 4.1, 4.2	• Determines and confirms stakeholder requirements, using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Interact with others	1.3, 2.1, 3.2, 4.2	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Develops and implements communications strategies with internal and external persons in order to build rapport
Get the work done	1.1, 1.2, 2.2, 2.4, 4.2	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve processes • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD605 Elicit ICT requirements	ICASAD605A Elicit IT requirements	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD605 Elicit ICT requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- construct and implement requirements for elicitation activities
- select and apply elicitation techniques that are appropriate to the situation
- document requirements and obtain stakeholder sign-off.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain conflict resolution and issue management techniques
- provide an overview of negotiation and consensus strategies
- summarise techniques to elicit and manage the gathering of requirements
- formulate risk management strategies with regard to requirements gathering, staff management and proposed systems
- outline scope management and change control processes
- describe version control and configuration management approaches.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- appropriate policies
- current business analysis tools
- appropriate legislation
- reports and plans prepared for the projects
- a portfolio of the project work to be undertaken.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAD606 Analyse stakeholder requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse stated requirements, determine potential solutions, and define possible features available to meet stakeholder needs.

This unit applies to individuals who require high-level management, business and technical skills necessary to manage complex analysis efforts within the information and communications technology (ICT) industry, often as part of business critical ICT projects.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prioritise requirements	1.1 Determine the basis for prioritisation of requirements 1.2 Resolve challenges in facilitating the prioritisation
2. Organise requirements	2.1 Articulate requirements at an appropriate level of abstraction 2.2 Devise appropriate models to describe the solution scope, based on informational needs of stakeholders 2.3 Document dependencies and inter-relationships among requirements
3. Specify and model requirements	3.1 Develop textual requirements 3.2 Generate matrices to convey or support identified requirements 3.3 Create models to document and communicate requirements and improvement opportunities
4. Define assumptions and constraints	4.1 Agree on assumptions to be defined and clarified as requirements are understood 4.2 Document and examine business constraints to identify options no longer available 4.3 Recognise and examine technical constraints that may restrict design or mandate standards to be followed
5. Verify requirements	5.1 Establish characteristics of requirements' quality 5.2 Undertake verification activities iteratively throughout the requirements analysis process
6. Validate requirements	6.1 Identify and define stakeholder requirement benefit assumptions so that associated risks can be managed 6.2 Generate measurable evaluation criteria to assess success of requirements benefit post implementation 6.3 Assign business value of requirements to assist in identifying candidates for elimination 6.4 Determine requirement dependencies for benefits realisation 6.5 Evaluate alignment with business case and opportunity cost to assist validation and decision making

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	4.3, 5.2, 6.1, 6.4, 6.5	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	2.1, 2.3, 3.1-3.3, 4.2	• Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately • Documents outcomes and changes to discussions, using industry relevant terminology • Writes, edits and proofreads documents to ensure clarity of meaning, and consistency of information
Oral Communication	2.1	• Presents complex information in formal situations, using clear and convincing language, tone and pace appropriate for the audience and purpose
Numeracy	6.2, 6.3	• Performs mathematical calculations to interpret and manipulate complex numerical information
Navigate the world of work	4.2	• Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met
Interact with others	2.2, 4.1, 6.3	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships
Get the work done	1.1, 1.2, 2.2, 4.1, 4.3, 5.1, 5.2, 6.1-6.5	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities, and decision making strategies where appropriate • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAD606 Analyse stakeholder requirements	ICASAD606A Analyse stakeholder requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD606 Analyse stakeholder requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- define, specify and prioritise stakeholder and solution requirements to a standard that would allow construction of a business solution
- verify and validate the requirements to ensure necessary quality, and support for stakeholder needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe business rules analysis
- explain data flow diagramming
- outline data, organisation and process modelling, and their relevant business and technical constraints
- explain functional decomposition
- describe risk management strategies
- explain the purpose of using scenarios, stories and case studies
- describe scope modelling.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- appropriate policies, current business analysis practices and tools
- relevant legislation
- special purpose tools, equipment and materials
- industry software packages
- reports and plans prepared for projects
- a portfolio of projects to be undertaken.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAD607 Manage assessment and validation of ICT solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine the best information and communications technology (ICT) solution and facilitate its implementation.

This unit applies to individuals who are required to assess and validate business processes, organisational structures, outsourcing agreements, software applications, and any other component of the solution to ensure that the overall solution delivers maximum value to stakeholders.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems analysis and design

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess proposed solution	1.1 Rank solution options on business value, and advantages and disadvantages of alternatives 1.2 Generate and consider solution options and additional capabilities
2. Allocate requirements	2.1 Allocate requirements to solution components to maximise business value 2.2 Facilitate allocation of requirements to a specific project release, phase or iteration
3. Assess organisational readiness	3.1 Conduct cultural assessment 3.2 Conduct operational or technical assessment 3.3 Perform stakeholder impact analysis
4. Define transition requirements	4.1 Evaluate old system actual data and metadata 4.2 Develop options for managing ongoing work during transition to the new solution 4.3 Participate in organisational change management recommendations or processes as required
5. Validate solution	5.1 Investigate defective solution outputs 5.2 Assess defects and issues
6. Evaluate solution performance	6.1 Realise value delivered by the solution 6.2 Validate solution metrics 6.3 Decide solution replacement or elimination

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1-3.3, 4.1, 5.1, 6.2	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.1, 1.2, 3.2, 3.3	• Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information • Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly
Navigate the world of work	4.3	• Takes a lead role in the development of organisational goals, roles and responsibilities • Monitors and reviews the organisation's policies, procedures and adherence to requirements in order to implement and manage change
Interact with others	3.1, 4.3	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships • Understands diversity and seeks to integrate diversity into the work context, for managing change, making decisions and achieving shared outcomes
Get the work done	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1-4.3, 5.1, 5.2, 6.1-6.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAD607 Manage assessment and validation of ICT solutions	ICASAD607A Manage assessment and validation of IT solutions	Updated to meet Standards for Training Packages. Minor edit to competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAD607 Manage assessment and validation of ICT solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- categorise benefits and disadvantages of various solution options
- assess cultural impact of different solutions
- compare transition requirements between solutions
- analyse output variances between solutions
- remove inappropriate solutions from list
- recommend remaining solutions in priority order
- validate solutions
- confirm solution metrics and evaluate the solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the impact of the business environment with regard to proposed information and communications technology (ICT) solutions
- describe and implement techniques for assessing options and validating solutions
- explain and apply organisational change management
- outline the principles of solution performance metrics.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems analysis and design field of work, and include access to:

- appropriate policies
- current business analysis practices and tools
- relevant legislation
- special purpose tools, equipment and materials
- industry software packages
- reports and plans prepared for projects
- portfolio of project work to be undertaken.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS201 Maintain inventories for equipment, software and documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to record and store details of software, hardware and technical documentation.

It applies to frontline technical support personnel who maintain equipment, software and related technical documentation in a small to large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Document and update inventory	1.1 Maintain hardware inventory that creates a profile or description of each piece of equipment 1.2 Maintain software inventory and update licences as required, particularly when upgrading software 1.3 Record and organise storage of user documentation or technical manuals
2. Store technical documentation	2.1 Store hardware, software and equipment that is not in use, according to technical manuals 2.2 Ensure technical documentation is stored securely 2.3 Access and disseminate technical documentation as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.2, 2.3	• Accesses and interprets textual information from a range of sources to record, manage and maintain information
Writing	1.1, 1.2, 1.3, 2,2	• Records organisation, software and client technical information, and sequences writing to produce cohesive text for reference
Oral Communication	1.3, 2.1	• Participates in verbal exchanges of basic ideas that elicit views, opinions and feedback from others
Navigate the world of work	1.2-1.3, 2.1-2.3	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters
Get the work done	1.1-1.3, 2.1-2.3	• Plans and implements routine tasks and workload, making limited decisions on sequencing, timing and collaboration, and seeking assistance in setting priorities • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS201 Maintain inventories for equipment, software and documentation	ICASAS201A Maintain inventories for equipment, software and documentation	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTSAS201 Maintain inventories for equipment, software and documentation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- update and maintain software, equipment and technical documentation inventory, according to identified storage and retrieval policy and procedures
- comply with software licensing requirements, according to vendor specifications
- access and update inventories.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe technical documentation processes
- describe common software licensing requirements
- describe inventory principles and procedures
- explain current industry practices related to storage of hardware, software and technical documentation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- personal computer, equipment and materials
- industry and inventory management software packages
- organisational documentation
- enterprise intranet.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS202 Apply problem-solving techniques to routine ICT malfunctions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply problem-solving techniques to determine the origin of a routine malfunction and plan for its resolution.

It applies to individuals who work under supervision to provide frontline technical support, diagnose technical problems and determine potential solutions. These are key components of this support role.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify routine problems	1.1 Identify hardware, software, user or procedural problem areas to appropriate person in the organisation 1.2 Define and determine problem to be investigated 1.3 Identify and document current conditions of the hardware, software, user or problem
2. Research solutions to routine problems	2.1 Identify potential solutions to problem 2.2 Develop, document, rank and present recommendations about possible solutions to appropriate person for decision
3. Recommend solutions to problems	3.1 Plan implementation of solutions 3.2 Plan evaluation of implemented solutions 3.3 Document recommended solution and submit to appropriate person for confirmation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.2, 3.1-3.3	• Interprets familiar textual information from a range of sources to identify misleading information, compare technical specifications, and identify solutions to new and emerging issues
Writing	1.3, 2.2, 3.3	• Develops materials and resources using simple vocabulary to record information in a sequential manner for client engagement as well as internal reference
Oral Communication	1.1, 2.2	• Participates in verbal exchanges of familiar ideas using questioning and active listening to elicit information and feedback from others
Navigate the world of work	1.1- 1.3, 2.1, 2.2, 3.1-3.3	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters
Interact with others	1.3, 2.2	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.3, 2.1, 2.2, 3.1-3.3	• Plans and implements routine tasks, aiming to complete them efficiently • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context, and seeks input from others when problems remain unresolved • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS202 Apply problem-solving techniques to routine ICT malfunctions	ICASAS202A Apply problem-solving techniques to routine IT malfunctions	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS202 Apply problem-solving techniques to routine ICT malfunctions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the root cause of a routine malfunction
- identify solutions
- produce documentation that recommends solutions to problems
- follow established procedures
- refer unresolved problems to support persons.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify current industry hardware and software products and services
- identify current industry maintenance, service and helpdesk practices, processes and procedures
- identify current operating systems
- identify current industry standard diagnostic tools
- describe common computer malfunctions and resolutions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- a workstation and industry software packages
- detailed information relating to organisational processes and procedures
- information on a range of Information and Communications
- Technology (ICT) business solutions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS203 Connect hardware peripherals

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to connect hardware peripherals according to instructions.

It applies to individuals employed in an information and communications technology (ICT) support role who are required to solve technical hardware and software incompatibility conflicts and problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements	1.1 Identify and confirm peripheral requirements of client according to organisational standards 1.2 Document client requirements and peripherals needed, and report findings to the appropriate person according to organisational standards 1.3 Verify client requirements with appropriate person according to organisational standards and reporting procedures 1.4 Take action to ensure client support expectations are covered by vendor warranty and support services
2. Obtain required peripherals	2.1 Obtain peripherals under instruction from appropriate person 2.2 Enter details of peripherals into equipment inventory according to organisational standards 2.3 Validate that contents of delivered components and physical contents match the packing list and resolve discrepancies if necessary 2.4 Store peripherals according to vendors guidelines
3. Connect hardware peripherals	3.1 Verify timeframe for installation schedule with client 3.2 Remove old peripherals with minimal disruption to clients if they are to be replaced, taking into account environmental considerations and work health and safety (WHS) standards 3.3 Connect new peripherals with minimum disruption to clients, taking into account operating system procedures 3.4 Configure computer to accept new peripherals 3.5 Test hardware peripherals and confirm client satisfaction, paying particular attention to possible effect on other systems and making adjustments as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.1-2.4, 3.1-3.5	• Interprets textual information from a range of sources to identify and adhere to requirements
Writing	1.2, 1.3, 1.4, 2.1	• Develops materials and resources using simple vocabulary to convey and record information and inventory, according to client and vendor requirements
Oral Communication	1.2, 1.3, 1.4, 2.1, 3.1, 3.5	• Participates in verbal exchanges of familiar ideas and information using questioning and active listening to elicit views, opinions and feedback from others
Navigate the world of work	1.1, 1.3, 1.4, 2.1-2.4, 3.2-3.5	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with organisational requirements, WHS standards and environmental considerations
Interact with others	1.1-1.4, 2.1, 3.1	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.4, 2.1-2.4, 3.1-3.5	• Plans and implements routine tasks, aiming to achieve them efficiently • Responds to predictable routine problems and implements standard or logical solutions • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS203 Connect hardware peripherals	ICASAS203A Connect hardware peripherals	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTSAS203 Connect hardware peripherals

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- connect several different types of hardware peripherals to the system safely and according to vendor instructions with a minimum of downtime, using known routines and procedures
- locate, interpret and use vendor documentation related to connection and storage of hardware peripherals
- test the operation of newly installed hardware peripherals and confirm client satisfaction
- follow work health and safety policies and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the commonly used computer operating systems
- identify help desk and maintenance practices
- describe common peripheral devices
- summarise WHS procedures for electrical equipment
- list the system components and describe their interconnectivity
- identify current industry accepted hardware and software products
- describe procedures relevant to maintaining inventory
- list the organisational guidelines and standards that impact on service support including:
  - external suppliers and vendors
  - internal and external communications
  - internet access
  - security of information and data
- identify common principles for environmentally sustainable business practices.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- sites with a representative range of workstations, hardware peripherals, internet connections and cabling
- software to be installed, interconnected and configured
- hardware and software currently used in industry
- technical documentation, including organisational hardware blueprint and vendor support.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTSAS204 Record client support requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to record, prioritise and escalate client support requests.

It applies to frontline technical support individuals who provide information and communications technology (ICT) client support in a small or large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Log requests for support	1.1 Record client support requests and requirements according to organisational standards 1.2 Review client support history and details 1.3 Check the information and request for accuracy and urgency according to organisational standards
2. Prioritise support requests with appropriate personnel	2.1 Identify guidelines for prioritising or rating client requests 2.2 Prioritise client request based on its criticality or effect on business
3. Record support request	3.1 Document support request according to organisational requirements 3.2 Refer requests to appropriate person or department for assistance

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1- 1.3, 2.1, 2.2	• Interprets familiar textual information from a range of sources to identify and review practices and determine that appropriate standards have been maintained
Writing	1.1, 3.1, 3.2	• Develops materials and resources using simple vocabulary to accurately convey and record client information according to requirements and standards
Navigate the world of work	1.1-1.3, 2.1-2.2, 3.1-3.2	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with organisational standards
Interact with others	3.2	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.3, 2.1-2.2, 3.1-3.2	• Plans and implements routine tasks, aiming to achieve them efficiently • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions, and evaluates the effectiveness of the outcome • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS204 Record client support requirements	ICASAS204A Record client support requirements	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS204 Record client support requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- log and record calls according to organisational policy and procedures
- prioritise and escalate client support requests according to organisational policy and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify a range of software and hardware diagnostic tools
- describe organisational procedures for escalating issues
- describe maintenance procedures
- identify business scheduling requirements
- describe current business practices to prepare reports
- identify organisational procedures to rate and prioritise client requests
- identify roles and responsibilities of the information and communications technology (ICT) division.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- sites where logging and client support may be recorded and prioritised
- client support history records
- organisational policy and procedures related to:
  - critical process
  - escalation procedures
  - logging procedures
  - prioritising client requests.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS205 Maintain ICT system integrity

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to protect and secure stand-alone or networked client server environments.

It applies to technical support individuals who are required to maintain workflow and quality processes in a small or large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Carry out system backup	1.1 Create and review organisational backup schedule 1.2 Determine storage media and hardware for backups 1.3 Ensure backups are carried out according to the schedule 1.4 Label and store backups according to organisational standards 1.5 Maintain records of backups
2. Restore system backup	2.1 Determine and test restoration procedures according to organisational standards 2.2 Restore data under instruction from an appropriate person 2.3 Restore data according to organisational standards 2.4 Document and report on backup results
3. Maintain virus protection	3.1 Maintain and update virus protection software according to operating system in use 3.2 Carry out virus scanning and report detected viruses to appropriate person 3.3 Remove viruses and update scanning software
4. Follow copyright procedures and record software licences where appropriate	4.1 Identify copyright procedures for licensed software used by the organisation 4.2 Maintain records of licence number and location 4.3 Monitor operation and use of licensed software where applicable 4.4 Check personal computers and networks to ensure software compliance 4.5 Report licensing anomalies related to software to an appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.3, 3.1-3.3, 4.1-4.5	• Interprets familiar textual information from a range of sources to identify and review practices and determine that appropriate standards have been maintained • Researches and interprets information to identify, monitor and evaluate technical information and maintain appropriate standards
Writing	1.4, 1.5, 2.4, 4.2, 4.5	• Develops materials and resources using simple vocabulary to record information in a sequential manner, adhering to standards for client engagement as well as internal reference
Navigate the world of work	1.1-1.5, 2.1-2.4, 3.1-3.3, 4.1-4.5	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with organisational standards
Interact with others	2.2, 4.5	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.5, 2.1-2.4, 3.1-3.3, 4.1-4.5	• Plans and implements routine tasks, aiming to achieve them efficiently • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions, and evaluates the effectiveness of the outcome • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS205 Maintain ICT system integrity	ICASAS205A Maintain IT system integrity	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS205 Maintain ICT system integrity

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- protect and secure stand-alone or networked client server environments and operating systems according to system maintenance procedures
- complete file backup according to organisational standards
- recover, delete and archive according to backup and recovery procedure
- check computers and networks for compliance with licensing requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify organisational standards regarding:
  - backup and recovery procedures and operations
  - labelling and storage of backups
- describe current industry accepted hardware and software products
- describe current viruses and protection methods
- identify common diagnostic tools
- identify inventory procedures
- identify maintenance procedures
- describe storage and retrieval guidelines
- explain system performance
- identify software copyright and General Public Licence (GPL) or copyright responsibilities.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- sites with a representative range of stand-alone and networked client server environments
- antivirus software
- technical records and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS206 Detect and protect from spam and destructive software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to reduce the risk of a computer's operation being affected by spam or destructive software.

It applies to technical support individuals who, while working under a level of supervision, have responsibility to exercise the discretion required to protect and secure equipment and software in a small or large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Detect and remove destructive software	1.1 Identify common types of destructive software 1.2 Select and install virus protection compatible with the operating system in use 1.3 Investigate other advanced systems of protection for further options 1.4 Install software updates on a regular basis 1.5 Configure software security settings to prevent destructive software from infecting computer 1.6 Run or schedule to run virus protection software on a regular basis 1.7 Report detected destructive software to appropriate person and remove the destructive software
2. Identify and take action to stop spam	2.1 Identify common types of spam 2.2 Take appropriate action in regard to spam 2.3 Configure and use a spam filter 2.4 Report spam to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.3	• Researches and interprets information to identify misleading information and compare technical specifications, and identify solutions to new and emerging issues to maintain system
Writing	1.7, 2.4	• Uses simple vocabulary to report information in a familiar sequential manner to the appropriate personnel
Oral Communication	1.7	• Presents factual information in a clear manner, using specific and appropriate language
Interact with others	1.7	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.7, 2.1-2.4	• Plans and implements routine tasks, aiming to achieve them efficiently • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context, and seeks input from others when problems remain unresolved • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTSAS206 Detect and protect from spam and destructive software	ICASAS206A Detect and protect from spam and destructive software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS206 Detect and protect from spam and destructive software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install virus protection software and updates
- schedule virus protection software to run on a regular basis
- remove common destructive software
- identify common spam types and take appropriate action.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe spam and virus intrusions and identify appropriate remedial actions
- identify the types of protective applications used against viruses and spam
- identify the operating systems supported by the organisation
- identify the common components of computer hardware that may be affected by spam.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- sites with a representative range of computer hardware, application software and operating systems
- current antivirus and anti-spam software
- technical records, vendor documentation, enterprise procedures and guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS207 Protect and secure information assets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure information assets are protected from improper access and appropriate actions are taken to secure assets in the event that they are threatened.

It applies to individuals who, while working under a level of supervision, have responsibility in a frontline technical support capacity to exercise in a small or large office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify assets and threats	1.1 Identify types of information assets in the organisation 1.2 Identify mechanisms by which information assets are accessed, transmitted and stored 1.3 Establish nature of threats to information assets and determine effect that loss or damage may have to the organisation
2. Secure assets	2.1 Identify actions, mechanisms and strategies to protect information assets 2.2 Secure assets within scope of authority 2.3 Report issues to appropriate person and other issues where they are outside scope of authority
3. Mitigate or prevent damage to assets	3.1 Identify signs and evidence that information assets are threatened or undergoing loss or damage 3.2 Provide first level response to reduce effects, mitigate damage and protect evidence 3.3 Report incident, effects and actions to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.2, 2.3, 3.1	• Researches and interprets text to identify misleading information and compare technical specifications, and identify solutions to new and emerging issues to maintain system
Writing	2.3, 3.3	• Uses simple vocabulary to report textual information in a sequential manner to the appropriate personnel
Oral Communication	2.3	• Presents factual information in a clear manner, using specific and appropriate language
Navigate the world of work	1.1-1.3, 2.1-2.3, 3.1-3.3	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with organisational standards
Interact with others	2.2, 2.3	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.3	• Plans and implements routine tasks, aiming to achieve them efficiently • Initiates standard diagnostic procedures when responding to familiar and unfamiliar problems within immediate context, and seeks input from others when problems remain unresolved • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS207 Protect and secure information assets	ICASAS207A Protect and secure information assets	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS207 Protect and secure information assets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the organisation's information assets and the ways in which these assets are used
- establish potential threats to information assets and analyse the effects these threats would have on the organisation
- implement measures to secure assets, and mitigate or prevent damage, according to organisational requirements
- discuss details of security threats and issues relating to information assets with appropriate persons
- report issues or incidents according to organisational requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify information assets and key sources of information assets
- identify the types of security responses available to secure assets
- identify assets supported by the organisation
- describe general information and communications technology (ICT) hardware and security implications
- identify the organisation’s security procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- a site with computer hardware and office environments representing a range of workplaces
- appropriate software systems
- organisational information assets
- technical records, documentation and enterprise procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS208 Maintain ICT equipment and consumables

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to maintain the operation of basic computer hardware and peripherals, including the replacement of consumables.

It applies to technical support individuals who, while working under a level of supervision, perform mainly routine tasks within an office environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Clean equipment	1.1 Access and verify cleaning supplies for usability on the selected equipment 1.2 Record maintenance actions undertaken according to organisational procedures 1.3 Clean equipment according to manufacturer specifications and organisational manuals 1.4 Ensure basic work health and safety (WHS) principles and guidelines are followed
2. Replace and maintain consumables and supplies	2.1 Access consumables from storage points and record usage information according to organisational procedures 2.2 Replace consumables when needed and log the action undertaken 2.3 Dispose of consumables following environmental guidelines 2.4 Test equipment to ensure it is in working order at set time periods and according to organisational procedures
3. Maintain equipment	3.1 Establish which equipment requires maintenance 3.2 Maintain equipment according to organisational guidelines and manufacturer specifications 3.3 Document maintenance procedures performed according to organisational guidelines 3.4 Exercise care to prevent interruption of business activities during maintenance procedures 3.5 Store unused equipment devices according to manufacturer specifications and organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 2.1-2.4, 3.1, 3.2, 3.5	• Integrates and evaluates a range of textual information to maintain effective methods and appropriate standards
Writing	1.2, 2.1, 2.2, 3.3	• Uses simple vocabulary to record information in a sequential manner for internal reference
Oral Communication	3.4	• Uses listening and questioning techniques to clarify schedules while maintaining business standards
Numeracy	2.4, 3.4	• Recognises and applies familiar measurements relating to time durations
Navigate the world of work	1.1-1.4, 2,1-2.4, 3.1-3.5	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with organisational procedures, WHS and environmental guidelines
Get the work done	1.1-1.4, 2.1-2.4, 3.1-3.5	• Plans and implements routine tasks, aiming to achieve them efficiently • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions, and evaluates the effectiveness of the outcome • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS208 Maintain ICT equipment and consumables	ICASAS208A Maintain IT equipment and consumables	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS208 Maintain ICT equipment and consumables

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- clean equipment following manufacturer specifications and work health and safety (WHS) policy and procedures
- replace and dispose of consumables according to regulations and organisational policy
- test and maintain equipment in working order, following WHS procedures
- record activities and actions appropriately.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify current industry accepted hardware and software, and manufacturer maintenance guides
- describe organisational systems related to storage and retrieval of information and equipment
- identify workplace health and safety principles and responsibilities, including ergonomics, work periods and breaks, and conservation techniques
- identify chemical storage, control and disposal procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- a site at which equipment maintenance may be carried out
- equipment currently used in industry
- relevant equipment documentation that may affect maintenance activities.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS209 Connect and use a home based local wireless network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to install, configure and secure devices to a small home based local network.

It applies to individuals who, while working under a level of supervision, have responsibility in a frontline technical support capacity.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm requirements for home office wireless network	1.1 Document client requirements and confirm with appropriate person 1.2 Identify available documentation and technical support options 1.3 Identify the digital devices to be connected to the network and confirm wireless network component requirements 1.4 Take action to ensure client support expectations are covered by vendor warranty and support services 1.5 Ensure required work health and safety (WHS) standards are incorporated as part of the installation process
2. Prepare for installation	2.1 Obtain digital devices and wireless network components 2.2 Validate that contents of delivered components and physical contents match the packing list and resolve discrepancies if necessary 2.3 Determine internet service provider (ISP) connection properties
3. Install and configure the wireless router and adapters	3.1 Install the wireless router 3.2 Configure the wireless router using the router configuration properties 3.3 Install the wireless adapters 3.4 Configure the wireless fidelity (Wi-Fi) system
4. Secure the wireless system	4.1 Set the security components of the system 4.2 Test the security components 4.3 Review any updated documentation regarding security issues and the components used

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.2, 1.3, 2.1, 3.1-3.4, 4.3	• Identifies and uses basic knowledge of industry hardware and software appropriate to the environment • Identifies and uses new or upgraded technology skills to enhance learning
Reading	1.2-1.5, 2.1-2.3, 3.1-3.4, 4.1-4.3	• Interprets a range of texts to evaluate and integrate strategies to maintain effective methods that adhere to client requirements and standards
Writing	1.1	• Uses simple vocabulary to record information in a sequential manner that adheres to client requirements and for internal reference
Oral Communication	1.1, 1.4	• Uses listening and questioning techniques to confirm requirements
Navigate the world of work	1.1-1.5, 2.1-2.3, 3.1-3.4, 4.1-4.3	• Understands roles and responsibilities for task and makes basic decisions on work completion parameters in accordance with client requirements and WHS standards
Interact with others	1.1, 1.2, 1.4, 2.2	• Identifies and takes steps to follow accepted communication practices and protocols
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.4, 4.1-4.3	• Plans and implements routine tasks aiming to achieve them efficiently • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions and evaluates the effectiveness of the outcome • Understands the purposes, specific functions and key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS209 Connect and use a home based local wireless network	ICASAS209A Connect and use a home based local wireless network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS209 Connect and use a home based local wireless network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine suitable wireless fidelity (Wi-Fi) requirements for small home office style settings
- connect and integrate Wi-Fi components into a small office system safely
- install and configure wireless routers and adapters as part of a Wi-Fi system
- secure components of a Wi-Fi system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify computer component installation procedures
- describe current industry accepted Wi-Fi network products
- describe Wi-Fi installation requirements
- identify and describe common Wi-Fi systems and Wi-Fi security considerations
- identify internet service provider (ISP) connection protocols
- identify and describe relevant work health and safety (WHS) procedures for electrical equipment
- identify wireless network components.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- the internet to enable configuration procedures
- Wi-Fi equipment currently used in industry
- technical support to support the Wi-Fi installation
- technical documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS301 Run standard diagnostic tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to troubleshoot problems and conduct diagnostic tests on a range of platforms.

It applies to individuals who, while working under a level of supervision, have responsibility to action tasks in a frontline technical support capacity.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify common symptoms and preventative maintenance techniques	1.1 Develop a troubleshooting process to help resolve problems 1.2 Determine the specific symptoms relevant to different types of hardware, operating system and printer problems 1.3 Identify common preventative maintenance techniques to support maintenance strategies
2. Operate system diagnostics	2.1 Run the system diagnostic program according to specification 2.2 Modify the system configuration as indicated by the diagnostic program 2.3 Carry out preventative maintenance in line with organisational guidelines
3. Scan system for viruses	3.1 Scan the system to check and maintain virus protection 3.2 Report identified viruses to an appropriate person 3.3 Remove virus infections found by the scan using software tools and procedures, or by restoring backups 3.4 Document relevant symptom and removal information

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.3, 3.3	• Interprets textual information to identify issues and solutions to maintain the appropriate standards
Writing	3.2, 3.4	• Records key information to note output of investigations, and sequences writing to produce cohesive text for reference
Oral Communication	3.2	• Presents factual information in a clear manner, using specific and appropriate language
Interact with others	3.2	• Selects and uses appropriate strategies to establish and maintain spoken communication in familiar and some unfamiliar contexts • Derives meaning from a range of oral texts in familiar and some unfamiliar contexts
Get the work done	All	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Applies formal problem solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts and identifying and evaluating several options for action • Understands key principles and concepts that underpin the design, application and operation of digital systems and tools

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS301 Run standard diagnostic tests	ICASAS301A Run standard diagnostic tests	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS301 Run standard diagnostic tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify hardware and operating system problems
- conduct diagnostic tests on a range of platforms according to preventative maintenance and diagnostic policy
- identify the root causes of the problems
- scan systems for computer viruses
- remove viruses using software tools and procedures
- remove viruses by restoring backups.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain, including client organisation structure and business functionality
- identify the current industry accepted hardware and software diagnostic tools, including products that manage:
  - backup procedures
  - configuration procedures
  - hardware maintenance
  - organisational security
- describe common symptoms of problems associated with:
  - desktop applications
  - operating systems
  - laptops
  - mobile devices
  - printers
  - other common peripherals
- describe a range of preventative tasks relevant to maintaining hardware and software applications
- describe the organisational procedures relevant to diagnostic testing.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment, materials and industry software packages
- security guidelines
- backup procedures
- diagnostic software
- organisational guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS303 Care for computer hardware

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the maintenance and location of hardware.

It applies to frontline technical support individuals who work under a level of supervision but have some responsibility to maintain organisational hardware.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish safe work practices	1.1 Determine, record and apply relevant legal requirements and work health and safety (WHS) standards to the installation and maintenance of computer hardware 1.2 Determine, record and apply requirements specified by hardware manufacturers 1.3 Determine, record and apply safe work practices, taking into account legal and manufacturer requirements
2. Establish location requirements for hardware and peripherals	2.1 Determine and apply suitable environmental conditions for hardware and peripherals 2.2 Determine and apply system protection devices where appropriate 2.3 Determine and apply requirements when moving hardware 2.4 Determine and apply suitable storage principles for hardware and associated peripherals and media
3. Establish maintenance practices	3.1 Determine maintenance requirements specified by the equipment manufacturer 3.2 Produce maintenance schedules 3.3 Perform diagnostic functions, including replacing suspect components with other serviceable components and reloading associated software 3.4 Determine whether unserviceable components are replaceable through warranty, replacement or upgrade 3.5 Perform diagnostic functions using the operating system and third party diagnostic tools
4. Determine appropriate hardware quality standards	4.1 Consider and apply business requirements in respect of hardware matters 4.2 Determine and apply quality standards to the selection of appropriate hardware and associated peripherals

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.4, 3.1, 3.4, 4.1, 4.2	• Researches and interprets a range of texts to identify requirements and standards, compare technical specifications, and identify solutions to new and emerging issues to maintain the environment
Writing	1.1-1.3, 3.2	• Uses simple vocabulary to record key information in a sequential manner to maintain the appropriate standards and for internal reference
Oral Communication	3.5	• Presents factual information in a clear manner, using specific and appropriate language
Numeracy	3.2, 4.1	• Recognises and applies familiar measurements relating to time durations and uses mathematical calculations to measure and calculate amounts
Navigate the world of work	1.1-1.3, 4.1, 4.2	• Takes some personal responsibility for adherence to legal and regulatory requirements by establishing safe work practices
Get the work done	All	• Plans and implements routine tasks and workload, making limited decisions on sequencing, timing and collaboration, and seeks assistance in setting priorities • Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions and evaluates the effectiveness of the outcome • Responds to predictable routine problems and implements standard or logical solutions • Identifies ideas for other applications and considers them in current contexts • Uses digital technology for basic reading, recording and searching information, and communications, following routine procedures and security requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS303 Care for computer hardware	ICASAS303A Care for computer hardware	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS303 Care for computer hardware

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- perform diagnostic functions by replacing components, reloading software and using operating system and other diagnostic tools
- establish location requirements for system hardware and associated peripheral devices
- follow safe work practices
- determine maintenance requirements and establish maintenance schedule
- apply appropriate quality standards to computer hardware and peripherals.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the range of quality levels in current common hardware
- describe the importance of maintenance
- describe workplace health and safety principles specific to working with mains-powered equipment
- identify and describe the potential environmental effects of common types of hardware
- identify common security issues that impact on computer hardware
- identify the software related to hardware operations
- identify common system hardware and associated peripherals functions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- computer hardware, software and diagnostic tools
- warranty records and reports
- maintenance schedules
- vendor documentation
- safe work practices.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS304 Provide basic system administration

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement components of systems backup, restore, security and licensing in a stand-alone or client server environment.

It applies to individuals who, while working under limited supervision, have responsibility in a frontline technical support capacity to exercise discretion and judgement, using appropriate knowledge to provide assistance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Record security access	1.1 Obtain client access requirements and clearance levels according to organisational requirements 1.2 Issue computer or network user account and password details to client 1.3 Provide security documentation and access to client 1.4 Record user account and security access details to maintain system integrity and assist later auditing
2. Record software licences	2.1 Determine what licensed software is used within the organisation 2.2 Maintain records of licence number and location 2.3 Check personal computers and network for illegal software 2.4 Report illegal software to appropriate person
3. Carry out system backup	3.1 Create or review organisational backup schedule 3.2 Complete file backups according to schedule 3.3 Label and store backups according to organisational requirements 3.4 Maintain record of backups
4. Restore system backup	4.1 Determine and test restore procedures according to organisational guidelines 4.2 Complete a restore under supervision of an appropriate person 4.3 Record completed restore according to organisational guidelines
5. Apply security access controls	5.1 Document security access as per clearance guidelines set by management 5.2 Maintain a security access register in line with organisational guidelines to record which client or groups have access to which resources 5.3 Identify the security controls on the file system provided by the operating system 5.4 Apply effective access control on files and directories

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 4.1, 5.1, 5.3	• Interprets and evaluates a range of textual information to maintain effective methods while adhering to appropriate standards
Writing	1.2, 1.4, 2.2, 2.4, 3.4, 4.3, 5.1, 5.2	• Records detailed information incorporating both factual and professional language that adheres to organisational standards
Oral Communication	1.2, 2.4, 4.2	• Provides information using language appropriate to environment and audience • Uses listening and questioning techniques to confirm understanding
Numeracy	1.4, 2.2, 3.3, 3.4, 4.1-4.3, 5.1-5.4	• Extracts and evaluates the mathematical information embedded in a range of tasks and texts to maintain records for internal reference
Navigate the world of work	1.1-1.4, 2.1-2.4	• Appreciates the implications of legal and regulatory responsibilities related to own work, and is beginning to recognise some general legal principles applicable in relation to security access and software
Interact with others	2.4, 4.2	• Selects the appropriate form, channel and mode of communication when reporting illegal software use • Contributes to specific activities requiring joint responsibility and accountability when completing a restore under supervision
Get the work done	All	• Takes responsibility for planning and organising own work, identifying ways of sequencing and combining elements for greater efficiency, and considering how to link with the work of others • Implements actions as per plan, making slight adjustments if necessary • Selects from a range of pre-determined options in routine situations, identifying and taking some situational factors into account • Monitors and controls access to digitally stored and transmitted information

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS304 Provide basic system administration	ICASAS304A Provide basic system administration	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS304 Provide basic system administration

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- perform a systems backup, restore and maintain correct usage according to licensing agreements in a stand-alone or client server environment
- maintain software licence records and check for copyright compliance within the system
- maintain security access records and apply access controls on network resources.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe common backup procedures
- identify and outline operating systems used by the organisation
- describe the organisational security procedures
- identify organisational standards to:
  - carry out backup and restore operations
  - label and store backups
  - record security and software details
- describe the selection, functions and features of appropriate diagnostic tools
- identify software copyright responsibilities
- identify the system's current functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- operating systems
- software licence records
- technical records and documentation
- organisational backup and restore procedures
- organisational security guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS305 Provide ICT advice to clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide information and communications technology (ICT) advice and support to clients, including the communication of comprehensive technical information.

It applies to frontline technical support individuals who work under a level of supervision but have responsibility for providing technical support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review client support issues	1.1 Check for new problems logged by client 1.2 Check previous logs for similar problems or requests from client 1.3 Investigate and document support issues affecting client 1.4 Notify client of the results of investigation and provide advice and support on findings 1.5 Obtain client feedback and make changes
2. Provide advice on software, hardware or network	2.1 Confirm software, hardware or network requirements with client 2.2 Investigate and document a solution 2.3 Document additional requirements identified in the investigation and refer them to the client 2.4 Obtain approval from client to implement the solution 2.5 Investigate and document amount of technical support client may require 2.6 Discuss and agree level of technical support identified with client 2.7 Arrange time with client when support will take place 2.8 Provide technical support as part of group or one-to-one instruction to the client 2.9 Provide manuals and help documentation to client
3. Obtain client feedback	3.1 Create an appropriate evaluation or feedback form or other mechanism to gather feedback about solution and support provided 3.2 Provide client with instructions on how to complete form or use other means of providing feedback 3.3 Distribute evaluation or feedback to client 3.4 Review feedback from client to identify areas for improvement

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3 , 1.5, 2.2, 2.5, 3.4	• Interprets and evaluates information to compare technical specifications, identify areas of improvement and recognise solutions to new and emerging issues
Writing	1.3-1.5, 2.2, 2.3, 2.5, 2.9, 3.1-3.4	• Uses written vocabulary, grammatical structures and conventions to accurately convey instructions and record complex information
Oral Communication	1.2, 1.4, 1.5, 2.1, 2.4-2.8	• Participates in verbal exchange of ideas/solutions using detailed and clear language to contribute information for discussion and confirm client requirements • Varies content, structure, style, tone and vocabulary to suit the needs of audiences
Interact with others	1.4, 1.5, 2.1, 2.3, 2.4, 2.6-2.9, 3.2, 3.3	• Participates in routine conversations directly relevant to role, responding and contributing in appropriate ways when providing advice to clients and receiving feedback • Shares information and resources, offers assistance voluntarily and provides feedback on others' work when providing client support
Get the work done	1-1-1.3, 1.5, 2.2-2.5, 2.7, 3.1-3.4	• Plans a range of routine, and some non-routine, tasks, accepting stated goals and aiming to achieve them efficiently when obtaining feedback from client • Implements actions as per plan, making slight adjustments if necessary, and addressing some unexpected issues • Selects from a range of predetermined options in routine situations, identifying and taking some situational factors into account • Applies formal problem solving processes when tackling an unfamiliar problem, breaking complex issues into manageable parts and identifying and evaluating several options for action • Understands key principles and concepts that underpin the design and operation of digital systems and tools

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS305 Provide ICT advice to clients	ICTSAS305A Provide IT advice to clients	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS305 Provide ICT advice to clients

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- investigate client support requests and provide a documented solution after consultation with client
- convey comprehensive technical information to clients in a clear, concise, jargon-free and coherent manner
- use technical manuals and 'help' documentation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe the available in-house and vendor support
- explain contract and service agreements with vendors
- identify features of different types of hardware supported by the organisation
- identify sources of information relevant to the provision of services and support
- identify operating system:
  - functions and basic features
  - supported by the organisation
- identify and describe security and network guidelines and procedures
- identify the advanced features of software, including the functions and support provided by the organisation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- peers and supervisors for obtaining information
- relevant information sources
- technical records and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS306 Maintain equipment and software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to carry out maintenance and fault repair according to organisational procedures, in order to keep equipment and software operating.

It applies to frontline technical support individuals who work under a level of supervision and have some responsibility to maintain computer systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine and undertake required equipment maintenance	1.1 Examine and review specified equipment and maintenance procedures in order to determine those procedures that can be handled internally 1.2 Organise and undertake internal maintenance as specified in the maintenance procedures 1.3 Report problems promptly to appropriate person
2. Diagnose and repair faults	2.1 Assess an existing problem situation and identify the main problem area 2.2 Test suspected faulty equipment or software for possible failures or performance degradation, using available technology 2.3 Analyse the test results 2.4 Review historical fault data for information of relevance to existing faults 2.5 Develop plans, with prioritised tasks and contingency arrangements for the repair or replacement of faulty equipment or software, with minimum disruption to client 2.6 Liaise with appropriate person to obtain approval for the plans 2.7 Obtain necessary components and repair equipment or software in a timely, organised manner, following work health and safety (WHS) standards
3. Update documentation and make recommendations for future maintenance	3.1 Record maintenance and fault data and equipment modifications, according to organisational standards 3.2 Identify and report instances where preventative measures are needed 3.3 Review and update maintenance and fault data, and report outcomes periodically to appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.3, 2.4, 2.7, 3.2	• Integrates and evaluates a range of textual information to record and maintain appropriate procedures while adhering to appropriate standards
Writing	1.3, 3.2, 3.3	• Conveys specific information using clear and precise language and the appropriate format for audience and purpose, and records information for internal reference
Oral Communication	1.3, 2.6, 3.3	• Articulates clearly using appropriate language and listening and questioning techniques to report data and confirm proposed plans
Numeracy	2.5, 2.7	• Recognises and applies familiar measurements relating to time durations
Navigate the world of work	3.1, 3.2, 3.3	• Understands how own role meshes with others and contributes to broader work goals when addressing organisational standards and reporting to appropriate persons
Interact with others	1.3, 2.6, 3.3	• Generally understands what to communicate, with whom and how when reporting problems, gaining approval for plans and reviewing and updating data and reporting outcomes
Get the work done	1.1, 1.2, 2.1-2.7, 3.1-3.3	• Plans a range of routine and some non-routine maintenance tasks, and repair or replacement of faulty equipment, accepting stated goals and aiming to achieve them efficiently • Selects from a range of predetermined options in routine situations, identifying and taking situational factors into account when determining whether procedures can be handled internally • Selects from a range of predetermined options when diagnosing and repairing faults, identifying and taking situational factors into account • Understands key principles and concepts that underpin the design and operation of digital systems and tools, and applies these when troubleshooting existing technology, repairing faults and making recommendations for future maintenance

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS306 Maintain equipment and software	ICASAS306A Maintain equipment and software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS306 Maintain equipment and software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- undertake maintenance according to maintenance procedures
- identify and resolve a defined range of equipment and software problems
- maintain accurate records according to organisational guidelines.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe equipment and software maintenance practices
- identify help-desk response level escalation procedures
- describe the operation and purpose of specified equipment
- identify and describe the operation of technical diagnostic tools
- identify quality assurance practices
- identify relevant service level agreements (SLAs) to determine conditions of the SLA cover
- describe client warranty claims, repair or replacement procedures
- identify system's current functionality
- describe organisational work health and safety (WHS) procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- technical environment with a variety of operational equipment
- maintenance procedures, software and tools
- technical manuals
- records and documentation
- organisation health and safety procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS307 Install, configure and secure a small office or home office network

Modification History

Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify available network components relevant to client requirements and to install, configure and secure those components as part of a small office or home office (SOHO) network.

It applies to individuals who work under a level of supervision and have experience with analysis and problem solving when working with technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm client requirements and identify relevant network equipment	1.1 Identify and clarify client requirements for the small office home office network 1.2 Identify most suitable network design to meet client requirements 1.3 Develop and document network design 1.4 Identify most suitable network technologies, devices and protocols and network cables and connectors to meet network design 1.5 Review available network technologies, devices and protocols and determine the most appropriate to meet client requirements 1.6 Source vendors and service suppliers to obtain specifications, availability and cost of identified components 1.7 Ensure client sign-off for proposed network design and associated components
2. Install and configure hardware and software	2.1 Develop installation plans with prioritised tasks and contingency arrangements for installation of components with minimum disruption to client 2.2 Liaise with appropriate person to obtain approval for plans, including security clearance and timing 2.3 Confirm and review supplier documentation that network cables and connectors have been installed according to industry standards, client requirements and building requirements 2.4 Install and configure computer and other hardware according to network design and industry standards, using knowledge of relevant installation and configuration tools 2.5 Install and configure network software according to network design and industry standards 2.6 Install and configure other software according to network design and industry standards
3. Configure and test network	3.1 Troubleshoot client-side connectivity using appropriate networking settings to review relevant network tools 3.2 Test installed software and hardware, using available networking tools to ensure components function as expected 3.3 Test network settings to ensure network is functioning

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ELEMENT	PERFORMANCE CRITERIA
	according to specification 3.4 Resolve problems identified in testing process
4. Secure network	4.1 Identify possible security concepts and technologies relevant to securing the network 4.2 Apply specific protection using identified security features to protect against possible network attacks 4.3 Troubleshoot different types of security intrusion symptoms and issues
5. Document completed work, hand over to client and obtain client approval	5.1 Document final network design and associated hardware, software and security features 5.2 Document installation, boot up and configuration procedures as per client requirements 5.3 Complete handover and secure sign-off from client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4-1.6, 2.3-2.6, 3.2, 3.3, 4.1, 4.3	• Interprets a range of texts to critically evaluate and design the appropriate network, comparing technical specifications and associated costs to install and maintain the network while adhering to requirements and standards
Writing	1.3, 1.7, 2.1, 2.3, 5.1, 5.2, 5.3	• Records specific information using clear and precise language and appropriate format to develop network plans, instructions, installation and technical specifications while adhering to requirements and standards
Oral Communication	1.1, 2.2, 2.3	• Participates in a verbal exchange of factual information using listening and questioning techniques to clarify appropriate network installation processes have been maintained and adhere to associated requirements and standards
Numeracy	1.2, 1.4, 1.6, 2.2-2.4	• Uses a range of mathematical calculations to evaluate and compare numerical information and forecast costs, and applies familiar measurements concerning available or consumed data, time durations and appropriate cable length
Navigate the world of work	1.7, 2.2, 5.3	• Recognises and follows explicit and implicit protocols and meets expectations associated with own role when obtaining approval and sign-off at relevant stages of job
Get the work done	All	• Plans a range of routine and some non-routine tasks, accepting stated goals and aiming to achieve them efficiently, confirming client requirements and identifying relevant equipment • Implements actions as per plan, making slight adjustments if necessary, and addressing some unexpected issues • Makes decisions quickly and intuitively in familiar situations requiring immediate attention, drawing on past experience to identify key variables, consider possible implications of different courses of action and determine the best course of action • Uses systematic, analytical processes in configuration and testing of network, setting goals, gathering relevant information, and identifying and evaluating

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		options against agreed criteria • Applies formal problem solving processes when resolving network problems and troubleshooting symptoms and issues, breaking complex issues into manageable parts and identifying and evaluating several options for action • Understands key principles and concepts that underpin the design and operation of digital systems and tools

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS307 Install, configure and secure a small office home office network	ICASAS307A Install, configure and secure a small office home office network	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS307 Install, configure and secure a small office or home office network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the most suitable network hardware and software equipment to meet client requirements
- install, configure and test the network according to client requirements, and produce appropriate documentation
- identify possible security threats and secure the network.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify current industry accepted hardware and software products, including those used for networks
- identify data and voice transmission technologies and protocols
- identify hardware and software installation procedures
- describe local area network (LAN) capabilities and characteristics, including:
  - network types
  - internet protocol addressing
  - switch and hub operation
- describe network connections, both wired and wireless
- describe networking technologies, including network operating systems and cabling standards
- describe network operating systems and their basic installation procedures for small office applications
- summarise set-up and configuration procedures
- summarise security implications for a home office network
- describe the methods to secure a home network
- identify small business and home office networking requirements
- identify software packages supported by the organisation
- identify and describe the industry standards applicable to small networks.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- current industry standard software, hardware, and networking technologies
- server and workstation hardware and software
- internet connection
- live network
- network components, hardware and software
- networked computers
- vendor hardware and software components
- technical documentation and installation manuals.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS401 Perform unit test for a class

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that the system is proved adequate, before handover to the client or user, by unit testing functionality and reliability of individual components.

It applies to individuals who use technical and specialised knowledge and apply a systematic approach to and fault finding and problem solving in information and communications technology (ICT) testing environments.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for test	1.1 Determine test criteria 1.2 Prepare test environment 1.3 Perform static tests using appropriate test tools to verify correct behaviour of modules 1.4 Use a test harness program to exercise module behaviour 1.5 Test objects containing lower level class instances separately 1.6 Prepare data to facilitate path testing 1.7 Prepare data to facilitate member function testing
2. Conduct test	2.1 Ensure clean test environment 2.2 Initialise test environment 2.3 Run test harness and document results in line with test and acceptance processes 2.4 Finalise test environment
3. Analyse and classify results	3.1 Review and classify test results to highlight areas of concern 3.2 Compare test results against requirements and design specifications in line with quality benchmarks 3.3 Forward test results to appropriate person 3.4 Review feedback 3.5 Ensure compliance with documentation and reporting standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.6, 1.7, 3.1-3.4	• Interprets and analyses technical specifications and numerical data from a range of sources to determine requirements and complete necessary actions
Writing	2.3, 3.2, 3.3, 3.5	• Records and presents specific information logically, using appropriate formats and structures, and revises documents based on feedback and outcomes
Oral Communication	1.1, 3.3	• Uses active questioning and listening techniques to confirm understanding of testing arrangements and to seek feedback
Numeracy	1.6, 1.7, 2.3, 3.1- 3.5	• Uses mathematical equations to calculate and compare numerical test data for technical reports and to determine required actions
Navigate the world of work	3.4, 3.5	• Takes personal responsibility for following explicit and implicit policies, procedures and standards
Interact with others	3.3	• Selects and uses appropriate conventions and protocols when communicating with clients and others in a range of work contexts
Get the work done	1.1-1.7, 2.1-2.4, 3.1-3.3, 3.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Uses the main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS401 Perform unit test for a class	ICASAS401A Perform unit test for a class	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS401 Perform unit test for a class

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare at least TWO test environments
- conduct unit tests, covering:
  - member function test
  - path test
  - static test
- analyse, document and report test results.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain object-oriented programming language
- compare and contrast the key features and processes of automated test tools
- discuss client business domain relating to class to be tested
- outline input and output requirements
- describe organisational requirements relating to class to be tested
- analyse system testing requirements
- analyse underlying test data.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment, materials
- industry software packages
- suitable test plan
- specific requirements
- design documents used in analysis of the test
- suitable class to test.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS402 Implement configuration management strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement administrative and technical procedures throughout the software development and documentation life cycle.

It applies to individuals working in a range of information and communications technology (ICT) development environments who have responsibility to ensure work is completed to quality standards and technical requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and clarify configuration management requirements	1.1 Develop and assemble identification standards for the naming and version control of software and documentation, and provide to stakeholders 1.2 Identify software configuration tools and procedures for the required level of integration into the programming environment 1.3 Identify responsibilities for configuration management within the project and for ongoing support, including approval of changes 1.4 Take action to ensure that stakeholders are aware of their roles 1.5 Identify point at which items are subjected to configuration control with stakeholders
2. Employ appropriate control mechanisms	2.1 Identify and document method for identification and recording of change requests in line with organisational requirements, and ensure this is maintained during development process 2.2 Take action to ensure evaluation criteria and process for approval of change requests are employed according to organisational requirements 2.3 Take action to ensure other management, security and access control criteria are employed according to organisational requirements 2.4 Implement controls to ensure that necessary audit trials and alerts for variations or non-conformance are continuously maintained during development
3. Implement monitoring mechanisms	3.1 Implement controls to ensure mechanisms to identify software status throughout the software development life cycle are continuously maintained 3.2 Document development and maintenance of records and status reports required to show the history of baselines and their links to backups 3.3 Take action to ensure level of detail required in status reports, and identification of target audiences, meet the configuration management procedures, International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and Australian Standards (AS) and organisational requirements 3.4 Integrate configuration management into general project

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ELEMENT	PERFORMANCE CRITERIA
	management processes for monitoring and control purposes and document
4. Manage release of product	4.1 Take action to ensure physical and functional completeness of items for release to all stakeholders 4.2 Identify and implement requirements for formal control of software products 4.3 Determine and document policies for retention of baseline or master copies, taking into account safety and security, legislative requirements and organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.3, 4.2	• Researches and analyses technical textual information and numerical data from a range of sources to determine requirements and complete necessary actions
Writing	1.1, 1.4, 2.1, 3.2, 3.4, 4.3	• Uses clear and accurate language and documentation formats appropriate to the audience/purpose to convey complex technical information
Oral Communication	1.1, 1.4	• Uses active questioning and listening techniques to confirm understanding, gain consensus on concepts and liaise with stakeholders
Numeracy	1.1, 2.1, 2.4, 3.2-3.4, 4.3	• Uses mathematical equations to calculate and compare numerical data for a range of technical and planning reports, and to determine required actions
Navigate the world of work	1.4, 2.1-2.3, 3.3	• Takes personal responsibility for following explicit and implicit policies and procedures, and ensures that necessary standards and legislative requirements are met
Interact with others	1.1	• Selects and uses appropriate conventions and protocols when communicating with co-workers and others in a range of work contexts
Get the work done	1.1-1.5, 2.1-2.4, 3.1-3.4, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision making processes for more complex and non-routine situations • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS402 Implement configuration management strategies	ICASAS402A Implement configuration management strategies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS402 Implement configuration management strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and clarify configuration management requirements
- identify and action control mechanisms
- implement administrative and technical procedures
- maintain reliable and valid technical and administrative procedures
- use quality processes, audit trails and version control.

Note: Evidence must be provided for at least TWO situations or organisations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast project planning methodologies and tools
- explain benchmarking methodologies when implementing monitoring mechanisms
- describe how to formulate software size models and size estimates when employing control mechanisms
- discuss quality assurance and quality processes when implementing monitoring mechanisms
- describe software development methodologies when identifying and clarifying configuration management requirements
- identify and summarise relevant organisational guidelines, legislation and codes of practice.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- configuration tools
- evaluation criteria
- process for approval of change requests
- templates for status reports.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS403 Review site environmental factors prior to ICT system implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to review, identify and assess the impact of site environmental factors prior to commencing information and communications technology (ICT) system installation.

It applies to individuals who use specialised knowledge and a systematic approach to assess a physical site to determine its suitability for system installation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan work area	1.1 Obtain technical and environmental system requirements for equipment to be installed and document site requirements, including work health and safety (WHS) site specific requirements 1.2 Consider and take action on requirements associated with equipment against installation requirements 1.3 Conduct on-site inspection and audit against site specifications 1.4 Formulate preliminary recommendations for site and assess impact on system installation schedule 1.5 Prepare preliminary report specifying recommended changes to the site to meet requirements and submit report to appropriate person for approval
2. Evaluate environment	2.1 Organise appropriate support staff to facilitate successful installation 2.2 Install cabling and other environmental equipment to required technical and industry standards 2.3 Manage hardware installation to ensure WHS standards for hardware installation are adhered to 2.4 Review and test hardware and software to ensure system meets client business requirements and system objectives
3. Document recommendations	3.1 Prepare final report documenting findings and issues relating to site requirements and preparation 3.2 Submit final recommendations to appropriate person for approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3	• Interprets and analyses complex technical and non-technical information and data from a range of sources to determine requirements and complete necessary actions
Writing	1.1, 1.4, 1.5, 3.1	• Accurately records a range of technical information and uses clear language and documentation formats to convey findings
Oral Communication	1.5, 2.2, 3.2	• Uses active questioning and listening techniques to confirm understanding and convey information to team members and clients
Numeracy	1.1, 1.3, 1.4, 3.1	• Uses mathematical equations to calculate and compare numerical data against technical requirements and to determine required actions
Navigate the world of work	1.1, 1.2, 2.3	• Takes personal responsibility for establishing and complying with legislative requirements
Interact with others	1.5, 2.2, 3.2	• Selects and uses appropriate conventions and protocols when communicating with co-workers and others in a range of work contexts
Get the work done	1.2-1.4, 2.1-2.4, 3.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required • Uses the main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS403 Review site environmental factors prior to ICT system implementation	ICASAS403A Review site environmental factors prior to IT system implementation	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS403 Review site environmental factors prior to ICT system implementation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify environmental prerequisites prior to commencement of information and communications technology (ICT) system installation
- sequence the preparatory steps
- consider time and budget constraints
- document and submit recommendations.

Note: Evidence must be provided for at least TWO site installation schedules.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss key features of current industry accepted hardware and software products
- analyse current system's functionality
- describe general features and capabilities of network devices
- describe physical prerequisites needed for system installation
- outline possible legislative requirements relating to cabling and building preservation
- identify key features of quality assurance practices
- discuss role of stakeholders and degree of stakeholder involvement
- describe vendor equipment specifications and installation requirements.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and material
- industry software packages
- staff resources and technical equipment
- live network
- server and workstation hardware and software
- several different device types to be installed
- a number of scenarios, such as local area networks (LANs) incorporating hubs, routers and peripherals.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS404 Acquire ICT system components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify information and communications technology (ICT) system components and use organisational procedures to purchase identified components.

It applies to individuals who use technical and specialised knowledge and apply a systematic approach to procure system components.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm system components for acquisition	1.1 Confirm client requirements, including software and operating system requirements 1.2 Review technical papers and recommendations that identify required hardware and software components 1.3 Review and clearly identify system components 1.4 Assess and determine the fit with existing technology by consulting with system developer 1.5 Identify and determine the best and current technology fit for each purpose by consulting with system developer 1.6 Develop a list of required system components with specifications and possible suppliers
2. Agree on methods of component acquisition	2.1 Identify and assess the client organisation's preferred acquisition methods and policies 2.2 Evaluate acquisition methods and alternatives for required hardware and software components against required service levels, cost constraints, geographic constraints and user preferences 2.3 Discuss and agree acquisition method with client 2.4 Inform users and other stakeholders of acquisition method

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1	• Interprets and analyses complex technical information and numerical data from a range of sources to determine client procurement requirements and complete necessary actions
Writing	1.6, 2.3, 2.4	• Accurately records technical information and uses clear language and documentation formats to convey findings
Oral Communication	1.1, 1.4, 1.5, 2.1-2.4	• Obtains information by listening and questioning, and participates in verbal exchanges of ideas/solutions using detailed and clear language to contribute information and express requirements
Numeracy	1.1-1.3, 2.1	• Uses mathematical equations to calculate and compare numerical data against technical requirements and to determine required actions
Interact with others	1.1, 1.4, 1.5, 2.3, 2.4	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.3-1.6, 2.1, 2.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS404 Acquire ICT system components	ICASAS404A Acquire IT system components	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS404 Acquire ICT system components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and confirm correct system components
- follow procurement procedures to purchase components
- fulfil technical and business requirements
- communicate with client and other stakeholders.

Note: Evidence must be provided for at least TWO systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast the key features of current industry accepted hardware and software products
- compare and contrast financial management options, including leasing arrangement
- identify information gathering techniques
- analyse risk management in relation to information and communications technology (ICT) component use and items procured
- outline quality assurance practices in relation to identifying and acquiring ICT system components
- discuss the client business domain
- research vendor product directions
- describe organisational procurement procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- current system architectures
- current business and ICT strategic plans
- data models
- functional process descriptions
- service levels
- user requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS405 Identify and evaluate ICT industry vendor technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to research, evaluate and recommend an industry vendor to supply information and communications technology (ICT) components, and to negotiate with the vendor for supply of identified components. It covers testing and making comparisons and evaluations, including consideration of factors such as after sales service and reliability.

It applies to individuals who use technical and specialised knowledge, and apply a systematic approach to select the most appropriate vendors for the organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select method to be used for identifying suitable vendor	1.1 Evaluate organisational purchasing policy as a means of identifying vendors and document outcomes 1.2 Consider and undertake other means of identifying suitable vendors and document outcomes 1.3 Recommend preferred method of vendor selection to client 1.4 Plan and document selection process
2. Review vendor offerings	2.1 Notify vendors of organisation's requirements 2.2 Undertake evaluation process by comparing offers against organisational requirements 2.3 Organise vendor demonstrations and performance benchmark tests 2.4 Select vendor based on specific technical criteria, servicing, warranty and after sales service
3. Prepare contracts and delivery requirements	3.1 Prepare contracts for review by appropriate person 3.2 Identify and document delivery arrangements with suppliers 3.3 Clarify installation responsibilities with suppliers 3.4 Review warranty and support requirements with suppliers and service-level agreement 3.5 Confirm details with client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.3	• Interprets, analyses and reviews complex technical information and numerical/financial data from a range of sources to determine client requirements and complete necessary actions
Writing	1.1-1.4, 2.1, 3.1-3.4	• Develops material containing specific requirements using clear and technical language, and organises content in a manner that supports the purpose of the document
Oral Communication	1.3, 2.1, 3.1, 3.3, 3.4	• Obtains information by listening and questioning and participates in verbal exchanges with a range of stakeholders using detailed and clear language to express requirements, gain consensus and convey information
Numeracy	1.1, 1.2, 1.4,	• Uses mathematical equations to calculate and compare numerical data against technical and financial requirements and to determine required actions
Interact with others	2.3, 3.1, 3.3, 3.5	• Selects and uses appropriate conventions and protocols when communicating with client, vendors and others in a range of work contexts
Get the work done	1.1, 1.2, 1.4, 2.1-2.4, 3.1-3.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS405 Identify and evaluate ICT industry vendor technologies	ICASAS405A Identify and evaluate IT industry vendor technologies	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS405 Identify and evaluate ICT industry vendor technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select an appropriate vendor to supply components according to organisational requirements
- communicate with vendors and clients
- evaluate vendors offerings
- prepare contracts and delivery documentation
- demonstrate consistency in the acquisition of technical and business requirements.

Note: Evidence must be provided on at least TWO occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss different benchmarking methodologies
- describe the key features of change management systems
- explain the key features of contracts in relation to supply and support
- compare and contrast the key features of current industry accepted hardware and software products
- compare and contrast the key features of financial management and leasing arrangements
- identify information gathering techniques
- outline quality assurance practices in relation to evaluating and recommending information and communications technology (ICT) vendors
- analyse risk management in relation to evaluating and recommending ICT vendors
- discuss the client business domain
- research vendor product trends.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- current business and ICT strategic plans
- service levels and user requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS406 Implement and hand over system components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure the system is operational prior to hand over for client use, including conducting formal testing and trials to determine whether the system satisfies its acceptance criteria.

It applies to individuals who may work under supervision but have a level of responsibility in ensuring work is planned and completed according to quality and client requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm system integrity	1.1 Check functioning of the system and its components in both a stand-alone and integrated environment 1.2 Specify shortcomings or problems and create an action plan 1.3 Review action plan with client 1.4 Document system components according to standards and procedures
2. Provide operation and maintenance guidance	2.1 Identify and document operational issues and procedures 2.2 Discuss maintenance issues with technical support, and document outcomes 2.3 Compare maintenance, operational and warranty considerations with service level agreements (SLAs) and document discrepancies 2.4 Clarify outstanding issues with client
3. Hand over system to client	3.1 Demonstrate installed system to client 3.2 Obtain client sign-off to confirm satisfaction and acceptance of the installed system 3.3 Discuss and confirm short-term implementation support with client 3.4 Discuss and confirm further training needs with client 3.5 Document needs and submit to appropriate person for action

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3,1.4, 2.3	• Interprets and analyses numeric data and textual information containing technical terms and specifications to determine and adhere to requirements
Writing	1.2, 1.4, 2.1-2.4, 3.5	• Records information using required format, accurate spelling and grammar, and terminology specific to requirements • Develops material containing specific requirements using clear and technical language, and organises content in a manner that supports the purpose of the document
Oral Communication	1.3, 2.2, 2.4, 3.1, 3.2, 3.4	• Uses clear language to explain technical information and participates effectively in verbal exchanges to clarify requirements in formal and informal situations
Navigate the world of work	1.1, 3.2	• Takes personal responsibility for following explicit and implicit policies, procedures and standards
Interact with others	1.3, 2.2, 2.4, 3.1, 3.3-3.5	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.1-1.3, 2.1, 2.3, 3.2-3.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required • Uses the main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS406 Implement and hand over system components	ICASAS406A Implement and hand over system components	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS406 Implement and hand over system components

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- confirm system integrity prior to hand over
- provide operational and maintenance guidance
- hand over system to client.

Note: Evidence must be provided on at least TWO occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss current business practices related to preparing reports, including confirming system integrity and handing over the system
- evaluate current industry accepted hardware and software products to enable candidate to optimise value of a supply contract
- outline key aspects of change management systems
- discuss issues relating to the client-business domain
- describe a range of information gathering techniques
- explain key operational procedures for ICT systems
- analyse key features and processes involved in project planning, including:
  - constraints
  - guidelines
  - deadlines
- outline key features of quality assurance practices
- analyse role of stakeholders in service level agreements (SLA) and discuss degree of stakeholder involvement in determining levels of responsibility in a project
- describe vendor product trend directions.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- customer computer site and system or suitable simulated system and environment
- implementation plan
- people involved in hand over
- project plan
- service level agreements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS407 Conduct pre-installation audit for software installation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify and appraise critical pre-existing systems or components prior to the installation of software, including establishing compatibility and interoperability requirements.

It applies to individuals who apply technical and specialised software development knowledge and systematic approaches to determine client/system software requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess compatibility of existing software	1.1 Confirm details of software loaded on client system from actual system and from existing system documentation 1.2 Identify software prerequisites for new software 1.3 Confirm customer requirements with technical specifications 1.4 Confirm and assess compatibility issues against installation plan and cost constraints 1.5 Document recommendations on variances, level and software consistency for consideration by appropriate person
2. Confirm interoperability of software with environment	2.1 Confirm no conflicts between new software and previously installed software and hardware 2.2 Measure degree of interoperability between software 2.3 Confirm interoperable functioning of all software involved
3. Assess system capacity to install ordered software	3.1 Obtain details of current system memory, disk, available disk storage, and other specific hardware requirements from investigation of system and system documentation 3.2 Confirm hardware prerequisites for new software are met, implications noted and minimum requirements identified 3.3 Confirm and assess capacity issues against installation plan and cost constraints 3.4 Document recommendations on variances in capacity for consideration by appropriate person
4. Prepare and distribute audit report	4.1 Document findings, recommendations and impact on project in a manner appropriate for target audience 4.2 Present and distribute the audit analysis report according to organisational standards and procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 3.1	• Compares and contrasts complex technical information and numerical/financial data from a range of sources to determine client requirements and complete necessary actions
Writing	1.5, 3.2, 4.1, 4.2	• Develops material containing specific requirements using clear and technical language, and organises content in a manner that supports the purpose of the document
Oral Communication	1.3, 1.5, 3.4, 4.2	• Obtains information by listening and questioning, and participates in verbal exchanges with a range of stakeholders, using detailed and clear language to express requirements and present information
Numeracy	1.4, 2.2, 3.1-3.4, 4.1	• Uses mathematical equations to calculate and compare numerical data against technical and financial requirements, and to determine required actions
Interact with others	1.3, 1.5, 3.4, 4.2	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.4, 4.1	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying and documenting issues • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS407 Conduct pre-installation audit for software installation	ICASAS407A Conduct pre-installation audit for software installation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS407 Conduct pre-installation audit for software installation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assess capability of hardware on which new system is to be installed
- assess capacity of hardware to run the installed system
- confirm new systems will operate cooperatively with existing systems
- prepare an audit report and relevant documentation
- distribute the documentation.

Note: Evidence must be provided for at least TWO installations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast current industry accepted hardware and software product
- analyse a client business domain and the current information and communications technology (ICT) system functionality
- describe the key features of:
  - quality assurance practices
  - risk management practices
- describe the role of stakeholders and the degree of stakeholder involvement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment, materials and industry software packages
- documentation tools
- operational system and system specifications
- technical specifications of software to be installed.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS408 Complete data transition in data migration process

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake manipulation, migration and conversion of data between systems or databases while maintaining data integrity.

It applies to individuals who use technical and specialised knowledge, and apply a systematic approach to perform operations relating to the implementation of new systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Perform data transition	1.1 Identify and document data that is to be migrated, transferred or archived 1.2 Collect required data, target database requirements and implementation details 1.3 Clean up data to match new data structures and rules 1.4 Write and test conversion programs if required by the implementation plan, or use conversion tools 1.5 Ensure clean data take-on by re-keying or converting according to database requirements and conversion plan 1.6 Migrate data to target environment 1.7 Archive data according to requirements
2. Check data transition	2.1 Run reports and other tests on old and new data to verify the quantity and quality of data transition 2.2 Run production or specialised programs against data to confirm control totals 2.3 Check referential integrity and data constraints and requirements against database requirements and conversion plan 2.4 Verify that data transition has been completed according to requirements and plans

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 2.2, 2.3	• Compares and contrasts complex technical information and numerical data from different sources to determine requirements and complete necessary actions
Writing	1.1, 1.4	• Develops material using specific and technical language, and organises content in a manner that supports the purpose of the document
Numeracy	2.1, 2.2	• Uses mathematical equations to calculate quantities and to compare numerical data against technical requirements to determine required actions
Get the work done	1.1-1.7, 2.1-2.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses main features and functions of digital tools to complete work tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS408 Complete data transition in data migration process	ICASAS408A Complete data transition in data migration process	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS408 Complete data transition in data migration process

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify data to be migrated
- transfer data from one system to another
- produce consistency in results
- verify database integrity for transferred data.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe current industry accepted hardware and software products, including their general features and capabilities
- identify and summarise new and existing systems' current functionality
- describe data management systems when performing data transition, including:
  - data integrity
  - database structures
  - quality assurance practices
  - software tools
  - system data requirements
- describe the client business domain relevant to data transition
- outline client's data management and data security policy and procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- conversion program
- data conversion plan
- databases to store data
- implementation plan.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS409 Manage risks involving ICT systems and technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement procedures that identify, analyse, evaluate and monitor risks involving information and communications technology (ICT) systems and technology. This includes the development and management of contingency plans.

It applies to individuals who provide high level technical skills and knowledge, and systematic approaches to manage risk in ICT systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish risk context	1.1 Review and document organisational and technical environment 1.2 Establish and document risk boundaries according to business operating and strategic environment
2. Identify risk factors	2.1 Develop or acquire a measurement scale for project risk, which includes importance, complexity, time and resources required 2.2 Identify project risks based on the measurement scale developed and document according to business requirements 2.3 Identify business impact of changes and document according to current and future business directions
3. Implement contingency plans	3.1 Classify each risk and create contingency plans that address how the risk will be monitored and overcome, if possible 3.2 Identify measurable benchmarks to track the treatment of risks to the new system 3.3 Identify risk management intervention points according to benchmarked performance tolerances 3.4 Demonstrate use of phased implementation and piloting to reduce risk factors
4. Monitor, update and report risk profile	4.1 Conduct regular risk updates to add new risks and remove old ones 4.2 Update contingency plans when appropriate to incorporate new information 4.3 Conduct risk reviews at major project milestones and document outcomes 4.4 Establish feedback processes to provide warning of potential new risks according to business requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	• Compares and contrasts complex technical information and numerical data from different sources to determine requirements and complete necessary actions
Writing	1.1, 1.2, 2.1-2.3, 3.1, 4.2, 4.3	• Develops material using specific and technical language, and organises content in a manner that supports the purpose of the document
Oral Communication	4.1, 4.3, 4.4	• Obtains information by listening and questioning, and participates in verbal exchanges with stakeholders using clear and accurate language to express requirements and present information
Numeracy	2.1-2.3, 3.2, 3.3, 4.2	• Uses mathematical equations to calculate and compare numerical data against benchmarks to determine required actions • Creates or uses measurement scales to rate and prioritise risk
Interact with others	4.1, 4.3, 4.4	• Selects and uses appropriate conventions and protocols when communicating with stakeholders in a range of work contexts
Get the work done	1.1, 1.2, 2.1-2.3, 3.1-3.4, 4.1-4.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS409 Manage risks involving ICT systems and technology	ICASAS409A Manage risks involving ICT systems and technology	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS409 Manage risks involving ICT systems and technology

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and document where risk occurs
- develop and implement measures to mitigate or obviate risk
- set up procedures for regular risk management
- monitor, review and report risk profile

Note: Evidence must be provided for at least TWO information and communications technology (ICT) environments.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse and discuss risk management strategies and issues
- outline key features of regulation, standards and codes of practice relevant to risk management including:
  - ethics
  - copyright and intellectual property
  - privacy legislation
- identify and describe guidelines required for updating technology
- describe the business supply chain for the ICT industry
- summarise user analysis and the client relationship management (CRM) systems
- describe business process design principles in relation to risk management.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- analysis software
- business website
- networks
- requirements documentation
- risk management plan
- site server
- site server software
- software applications
- updated or new technology
- user analysis
- web servers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS410 Identify and resolve client ICT problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to record and prioritise client support activities, determine the required resources, solve client information and communications technology (ICT) problems or escalate as necessary.

It applies to experienced individuals who apply specialised and technical knowledge and have responsibility for providing support to end users.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine client problems	1.1 Determine client problem by using questioning or other techniques 1.2 Document responses of client for follow-up action 1.3 Examine logged requests to determine specific requirements 1.4 Take action where required to gain further information 1.5 Refer to a database of known problems to identify possible resolution options
2. Prioritise client problems	2.1 Determine scale of the problem based on information gathered 2.2 Establish and record relevant constraints 2.3 Undertake an impact analysis of the problem to determine severity and risks 2.4 Prioritise problem according to organisation's escalation procedures 2.5 Provide advice and support to the client from database of known problems, where appropriate
3. Refer problems where required	3.1 Investigate and apply appropriate process to follow when referring problems to third parties 3.2 Provide third party with client and problem details as required 3.3 Document advice and support provided by third party according to organisational guidelines, where appropriate
4. Carry out maintenance	4.1 Obtain appropriate components for resolution in line with organisational guidelines 4.2 Complete maintenance in line with organisational guidelines 4.3 Store or dispose of used components following organisational environmental guidelines
5. Prepare maintenance report	5.1 Prepare a maintenance report, including information about problems and resolution action 5.2 Forward maintenance report to client for feedback
6. Confirm problem resolution	6.1 Obtain feedback from client to ensure requirements have been met 6.2 Forward client feedback to appropriate person for sign-off and

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ELEMENT	PERFORMANCE CRITERIA
	record in known problems database as appropriate

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.5, 2.2, 6.1, 6.2	• Interprets technical specifications and numerical data from a range of documentation and sources to assist in rectifying problems
Writing	1.2, 2.2, 2.5, 3.2, 3.3, 5.1	• Uses clear language and formats appropriate for the audience to convey explicit technical information, requirements and recommendations
Oral Communication	1.1, 2.5, 3.2, 5.2, 6.1	• Uses inclusive questioning techniques to obtain information from clients and provides clear and precise advice and information to others
Navigate the world of work	1.4	• Develops and maintains knowledge relevant to work role
Interact with others	1.1, 2.5, 5.2, 6.1, 6.2	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.1, 1.4, 1.5, 2.1-2.4, 3.1-3.3, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS410 Identify and resolve client ICT problems	ICASAS410A Identify and resolve client IT problems	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS410 Identify and resolve client ICT problems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- record and prioritise client support activities
- determine required resources
- resolve client problems or escalate according to organisational guidelines or practices
- prepare maintenance report
- seek and record client feedback.

Note: Evidence must be supplied for at least two client support activities.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe hardware and software products:
  - currently in use
  - supported by the organisation
- outline sustainable practices consistent with information and communications technology (ICT) industry
- explain help desk or service desk structure and escalation procedures
- describe key functions and basic features of operating system
- describe organisational structure of workplace
- discuss principles of equal employment opportunity and anti-discrimination relating to client ICT problems
- relating to client ICT problems
- outline workplace security and network guidelines and procedures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- sites with a representative range of current industry-standard hardware, software and diagnostic tools
- technical records
- organisational guidelines
- vendor documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS411 Assist with policy development for client support procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes skills and knowledge required to contribute to the formulation of client support procedures to be included within organisational policy.

It applies to experienced individuals who may work under supervision and have a level of responsibility to ensure work is completed to quality standards and requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine support issues	1.1 Review current client support procedures followed by the organisation if appropriate 1.2 Gather feedback from client detailing positive and negative aspects of their contact with the organisation 1.3 Gather feedback from user who executes client support procedures, detailing problems with current methods
2. Develop client support procedures	2.1 Create or update client support procedures using information gathered from client and user 2.2 Forward new client support procedures to appropriate person for review
3. Provide recommended changes for client support policy	3.1 Evaluate feedback on client support policy 3.2 Incorporate changes to client support policy 3.3 Determine impact the new policy will have on organisational guidelines and client interactions 3.4 Prepare report detailing changes in policy and impact on the client and user in a clear and concise manner 3.5 Forward report and updated policy to appropriate person for approval
4. Update documented client support policy	4.1 Amend policies to include new client support procedures 4.2 Issue new policies to clients and users in line with organisational guidelines 4.3 Maintain policy updates in line with organisational guidelines

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1	• Interprets and analyses technical information and numerical data from different sources to determine requirements and complete necessary actions
Writing	1.2, 1.3, 2.1, 3.2, 3.4, 4.1	• Develops and presents specific information logically and concisely, using appropriate formats and clear and accurate language • Revises documents based on feedback from others and implements version-control procedures
Oral Communication	1.2, 1.3, 2.2, 3.5, 4.2	• Effectively uses questioning and active listening techniques, and participates in verbal exchanges to obtain information and gather feedback from a range of stakeholders • Uses detailed and clear language to express requirements and present information
Numeracy	1.1, 2.1, 3.4, 4.1	• Interprets, analyses and presents numeric information in documents and reports
Navigate the world of work	4.3	• Takes personal responsibility for maintaining policies as required by organisational guideline
Interact with others	2.2, 3.5, 4.2	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.1-1.3, 2.1, 2.2, 3.1-3.4, 4.1, 4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS411 Assist with policy development for client support procedures	ICASAS411A Assist with policy development for client support procedures	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS411 Assist with policy development for client support procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate and analyse existing client support policy and procedures
- create or update procedures for current or emerging needs
- elicit feedback and review proposed changes
- make recommendations on new changes
- update and maintain policies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss current trends and issues in information and communications technology (ICT) relevant to client support
- describe the key features of the organisational guidelines for client maintenance and administration
- explain the key features of organisational policy for access and security
- describe the review process and its key stages.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- sites, peers and supervisors to identify the extent and quality of the contribution required
- information about systems or networks to be supported
- technical manuals, tools and organisational guidelines
- current business requirements and documentation standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS412 Action change requests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to receive, review and carry out change requests while using a change management system, according to client requirements.

This unit applies to individuals who may work under supervision and have a level of responsibility to ensure work is completed to quality standards and requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review change requests	1.1 Receive and document requests for hardware and software changes from client, using a change management system and according to organisational help desk procedures 1.2 Gather and organise system data relevant to the change requests, using available diagnostic tools 1.3 Review proposed changes against current and future business requirements and examine system data, with work team, to select appropriate changes 1.4 Discuss and clarify the selected changes with client
2. Modify system according to requested changes	2.1 Develop a plan, with prioritised tasks and contingency arrangements, for modification of the system 2.2 Undertake selected system changes according to organisational guidelines and procedures, and according to manufacturer recommendations 2.3 Test system changes for performance, and identify problems 2.4 Resolve identified problems 2.5 Revise relevant client and technical documentation to reflect system changes according to organisational standards 2.6 Notify client of status of change and update change management system, as per organisational help desk procedures
3. Prepare and deliver training on use of modified system	3.1 Prepare training to meet needs of client in using the changed system 3.2 Deliver prepared training appropriate to client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2,1.3	• Interprets and analyses technical textual information and numerical data to determine requirements and complete necessary actions
Writing	1.1, 1.4, 2.1, 2.5, 2.6	• Uses clear language and formats appropriate to the task to record and update explicit technical information, requirements and recommendations
Oral Communication	1.4, 2.6, 3.2	• Uses clear and precise language, and interacts effectively with a range of personnel to convey complex technical information, including during training sessions
Interact with others	1.3, 3.2	• Selects and uses appropriate conventions and protocols when communicating with co-workers and client in a range of work contexts
Get the work done	1.1-1.3, 2.1-2.6, 3.1, 3.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required • Uses main features and functions of digital tools to complete work tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS412 Action change requests	ICASAS412A Action change requests	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTSAS412 Action change requests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review and assess change requests/requirements
- prioritise tasks
- plan and implement change procedures
- comply with organisational guidelines and client requirements
- prepare and deliver training appropriate to the client.

Note: Evidence must be provided for at least TWO organisations or situations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse current practices relating to:
  - change management procedures and criteria
  - change-management tools
  - help desk practices
  - quality assurance practices
- describe key features of the client business domain including the role of stakeholders and the degree of stakeholder involvement
- describe the key features and capabilities of current industry-accepted hardware and software products
- analyse current service level agreements (SLAs) within or between organisations
- explain the process for system testing
- outline the system's current functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- change request documentation
- physical system or network
- technical manuals
- appropriate diagnostic tools
- current business requirements
- documentation standards
- Change management system.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS413 Manage resolution of system faults on a live system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage reactive errors and failures on a live system.

It applies to individuals who apply specialised and technical knowledge and a systematic approach to monitor, maintain and troubleshoot maintenance requirements on systems that are currently operating.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine maintenance methodologies and repositories	1.1 Identify the nature of modification to the system 1.2 Confirm existence and currency of repositories 1.3 Review repositories for changes and develop new backup procedures 1.4 Prepare or check modification request forms and levels of authority for sign-off 1.5 Develop a hierarchy of modifications and the response for each 1.6 Determine backup and blackout strategies in place
2. Implement change management system	2.1 Follow standards and procedures for logging the change request 2.2 Document expected impact to user base during implementation 2.3 Identify levels of possible failure and related reporting procedures 2.4 Document expected outcomes of the modification 2.5 Inform user of modification implications 2.6 Assign modification to appropriate person for actioning
3. Report review of results	3.1 Complete aspects of the change system and ensure modification is tested and operational 3.2 Prepare report and deliver to appropriate person, indicating the results of modification 3.3 Update and amend documentation and repositories

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3	• Interprets technical and non-technical information and numerical data from a range of documentation and sources to assist with troubleshooting and rectifying problems
Writing	1.3-1.5, 2.2, 2.4, 2.5, 3.2, 3.3	• Records and reports specific information logically, using appropriate formats and structures, and revises and updates documentation and repositories based on outcomes of action
Oral Communication	2.5, 2.6	• Uses industry specific vocabulary to explain and present information to a range of personnel
Numeracy	1.2, 1.3, 1.5, 2.1, 3.2, 3.3	• Uses mathematical equations to calculate and compare numerical data to determine required actions and for preparing technical reports
Interact with others	2.5, 2.6, 3.2	• Selects and uses appropriate conventions and protocols when communicating with co-workers and others in a range of work contexts
Get the work done	1.1-1.6, 2.1-2.3, 2.6, 3.1-3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions, seeking input from others as required • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTSAS413 Manage resolution of system faults on a live system	ICASAS413A Manage resolution of system faults on a live system	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS413 Manage resolution of system faults on a live system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the required modifications
- itemise the expected outcomes of the modifications
- implement the modifications
- document and report on the modifications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of change control procedures
- describe the key features of the client business domain including the role of stakeholders and the degree of stakeholder involvement
- describe the key features and capabilities of current industry accepted hardware and software products
- analyse the key features of help desk and maintenance practices
- discuss quality assurance practices
- explain the process for system testing
- outline the system's current functionality and describe the features and functions of the system under modification
- identify and summarise industry standards that apply to the information and communications technology (ICT) industry.
-

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, including access to:

- special purpose tools, equipment and materials
- live system
- benchmarking and testing tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS414 Evaluate system status

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes skills and knowledge required to evaluate the status of a running system, covering both hardware and software aspects to determine system performance and reliability.

It applies to individuals who apply specialised and technical knowledge and a systematic approach to assessing and evaluating systems prior to problem resolution or upgrades.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine scope and evaluation parameters	1.1 Determine scope of the system evaluation 1.2 Comply with organisational requirements when planning a 'change of status' test 1.3 Review reason for the evaluation, its objectives, deliverables and key performance indicators, using appropriate capacity tools 1.4 Plan and document status evaluation and factor in time, environment, internal and external issues 1.5 Alert affected users if evaluation is likely to impact their operations 1.6 Develop a plan for the evaluation and identify resources and methods to be used
2. Carry out evaluation	2.1 Organise required resources as outlined in the plan, and put in place manual or computerised evaluation methods 2.2 Run evaluation process according to agreed scope and evaluation parameters 2.3 Record status as per procedural parameters and plan 2.4 Observe and document during evaluation the effects of changes to system status that are made, according to effect being evaluated 2.5 Observe and record effects not listed and that may require further investigation
3. Report on evaluation	3.1 Prepare a report to the appropriate person, indicating results of status check in the documentation 3.2 Highlight anomalies observed in status check that are outside the expected results 3.3 Make recommendations for changes to improve system

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 2.4, 2.5	• Analyses and evaluates technical and non-technical information and numerical data from a range of sources to assist with fault finding and troubleshooting problems
Writing	1.4-1.6, 2.3-2.5, 3.1, 3.2	• Prepares material using clear and accurate language and numerical data in order to convey explicit information, requirements and recommendations
Oral Communication	1.5	• Participates in verbal exchanges with a range of stakeholders to obtain information and express requirements
Numeracy	1.4, 2.4, 2.5, 3.1, 3.2	• Uses mathematical equations to calculate and compare numerical data to determine required actions and for preparing technical reports
Interact with others	1.5, 3.1	• Selects and uses appropriate conventions and protocols when communicating with client and others in a range of work contexts
Get the work done	1.1-1.4, 1.6, 2.1, 2.2, 2.4, 2.5, 3.1-3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Uses formal analytical thinking techniques for identifying issues and generating possible solutions • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS414 Evaluate system status	ICASAS414A Evaluate system status	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS414 Evaluate system status

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine scope of system performance and reliability for hardware and software
- identify comprehensive performance indicators
- evaluate system performance
- document and report on results.

Note: Evidence must be provided for at least TWO systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss capacity planning
- describe the key features of change-control procedures
- describe the key features of client business domain, including the role and level of stakeholder involvement
- compare and contrast the key features and capabilities of current industry accepted hardware and software products
- describe the key features of help desk and maintenance practices
- describe the features of one or more change management tools
- discuss quality assurance practices
- explain the process for system testing
- outline the system's current functionality and describe the features and functions of the system under evaluation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- documentation standards
- backup and recovery policies
- database package with data
- server and networked personal computer.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSAS415 Optimise ICT system performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to identify, improve and monitor information and communications technology (ICT) system performance.

It applies to individuals who are experienced technical support personnel, such as help desk supervisors, ICT support technicians and user support specialists responsible for maintaining computer system performance.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify areas of poor performance	1.1 Collect system performance data during various usage conditions and times, using available technical tools 1.2 Evaluate the collected system performance data related to organisational benchmarks and client feedback to identify areas of poor performance
2. Investigate methods to improve system performance	2.1 Identify options to improve performance through discussing the system performance findings with appropriate person and accessing technical resources 2.2 Create a report for appropriate person, including cost analysis and identified options for alternative courses of action designed to measurably improve performance 2.3 Present report to appropriate person for decision as to preferred course of action
3. Develop an implementation plan for system optimisation	3.1 Develop a plan for implementing the approved optimisation, with prioritised tasks and minimum disruption to clients 3.2 Factor project budget and staff availability into the implementation plan 3.3 Submit the implementation plan to the appropriate person for approval and revision, if necessary
4. Modify system to optimise performance	4.1 Install or configure system components according to installation procedures and organisational guidelines, following the implementation plan 4.2 Measure and record the change in performance resulting from the system modification to assess that the required level of optimisation has been achieved 4.3 Update appropriate documentation according to organisational guidelines to reflect the system optimisation
5. Monitor ongoing system performance	5.1 Implement and maintain a performance register 5.2 Review and assess benchmarks and performance regularly with the work team to enable timely optimisation and updates

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 4.3	• Analyses and evaluates technical and non-technical information and numerical data from a range of sources to determine benchmarks and performance indicators
Writing	2.2, 2.3, 3.3, 4.2, 4.3, 5.1	• Accurately records information and numerical data, and prepares material using clear and accurate language to convey explicit information, requirements and recommendations
Oral Communication	2.1, 5.2	• Uses active listening and questioning techniques, and participates in verbal exchanges with a range of stakeholders to obtain information and express requirements
Numeracy	1.1, 2.2, 3.2, 4.2	• Uses mathematical equations to calculate and compare numerical and financial data to determine required actions and for preparing technical reports
Navigate the world of work	4.1	• Takes personal responsibility for following explicit and implicit policies and procedures
Interact with others	2.1-2.3, 3.3, 5.2	• Selects and uses appropriate conventions and protocols when communicating with co-workers and others in a range of work contexts • Collaborates with others to achieve shared goals
Get the work done	1.1,1.2, 2.1, 2.2, 3.1, 3.2, 4.1-4.3, 5.1, 5.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS415 Optimise ICT system performance	ICASAS415A Optimise IT system performance	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS415 Optimise ICT system performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse system performance and document a plan to improve performance
- modify and tune the system to keep the system balanced and performing well.

Note: Evidence must be provided for at least TWO organisations or occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse business scheduling requirements, including the role of stakeholders and the degree of stakeholder involvement
- compare and contrast current industry standard hardware and software monitoring tools, and how to interpret information produced from monitoring
- describe optimum system performance, change-control procedures and theoretical concepts
- analyse one or more change management tools
- discuss quality assurance practices with regard to proposed changes to information and communication technology (ICT) systems
- analyse current system functionality and describe the key features and functions of the system under modification.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to special purpose tools, equipment, materials and industry software packages including:

- special purpose tools, equipment and materials
- industry software packages, including:
  - system components and software for performance tuning
  - technical manuals and resources
  - fault logs
  - diagnostic tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAS416 Implement maintenance procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to set up maintenance procedures to keep equipment and software operating effectively.

It applies to individuals who use technical and specialised knowledge, and apply a systematic approach to maintaining computer equipment in an organisation.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine best practices for equipment and software maintenance	1.1 Identify equipment and software that are to be maintained, and implement processes to ensure future acquisitions of equipment and software are identified 1.2 Identify vendor documentation, peer organisations or research information detailing best practices in equipment and software maintenance to improve system performance and reliability 1.3 Develop recommended maintenance and operations guidelines for equipment and software maintenance based on the above research 1.4 Obtain requirements from user in the area of equipment maintenance and reliability 1.5 Document procedures for maintenance based on best practices
2. Identify resources to provide equipment and software maintenance	2.1 Identify and record the level of support that can be provided by in-house resources 2.2 Identify and record the support to be supplied by external or third-party organisations 2.3 Develop or update service level agreement (SLA) with internal user and third-party suppliers
3. Revise practices, where appropriate	3.1 Monitor and review maintenance operation 3.2 Identify problem areas, including failures to meet SLAs, and consider changes to maintenance procedures 3.3 Assess changes in consultation with user, support staff and third-party suppliers 3.4 Design and implement improvements to maintenance procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.2	• Researches and analyses technical and non-technical information and numerical data from a range of sources to determine benchmarks and performance indicators
Writing	1.3, 1.4, 1.5, 2.1-2.3, 3.3, 3.4	• Accurately records information and numerical data, and prepares material using clear and accurate language in order to convey explicit information, requirements and recommendations
Oral Communication	1.4, 2.3, 3.3	• Uses active listening and questioning techniques, and participates in verbal exchanges with a range of stakeholders in formal and informal situations to obtain information and express requirements
Numeracy	1.1, 1.2, 2.1,2.2, 3.2	• Uses mathematical equations to calculate and compare numerical data to determine required actions and for preparing documentation
Interact with others	1.4, 2.3, 3.3	• Selects and uses appropriate conventions and protocols when communicating with users and others in a range of work contexts
Get the work done	1.1-1.4, 2.3, 3.1-3.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS416 Implement maintenance procedures	ICASAS416A Implement maintenance procedures	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS416 Implement maintenance procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- set up and document the maintenance procedures to keep equipment and software operating
- identify resource requirements
- document or update service level agreements (SLAs)
- revise maintenance procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse client business domain including:
  - the role of stakeholders and the degree of stakeholder involvement
  - business scheduling requirements
- compare and contrast the key features and capabilities of current industry standard hardware and software products
- describe the key features and purpose of diagnostic tools and one or more change management tools
- describe the key features of help desk and maintenance practices and procedures
- discuss quality assurance practices
- analyse the system's current functionality and performance level.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- industry software packages
- technical environment with a variety of operational equipment
- technical manuals and tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAS417 Undertake ICT system capacity planning

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and assess the current and future capacity requirements of an information and communications technology (ICT) system, plan future enhancements and install the identified enhancements.

It applies to experienced individuals who work under limited supervision and use technical and specialised knowledge to undertake strategic planning and forecasting initiatives.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse existing system capacity	1.1 Review existing system configuration information, both hardware and software, to determine capacity issues 1.2 Investigate the current system workload and analyse its effect on the capacity to perform 1.3 Examine the current service level agreement (SLA) to determine agreed-upon capacity standards 1.4 Examine and analyse the fault logs for those caused by capacity problems 1.5 Discuss and review capacity issues with users 1.6 Document information gathered about the existing system workload and capacity according to organisational guidelines
2. Determine future capacity requirements	2.1 Interview the user to gather data about future system capacity requirements 2.2 Organise, analyse and evaluate future requirements data to obtain a forecast workload for the system 2.3 Using data and information gathered, compare existing workload with the forecast workload and evaluate to determine capacity problem areas 2.4 Estimate resources and equipment required to resolve predicted capacity problems 2.5 Undertake a financial analysis of the estimated capacity requirements 2.6 Organise and document information according to organisational guidelines 2.7 Prepare and present a report to appropriate person, detailing recommendations for capacity enhancements based on an analysis of documentation
3. Develop plan for capacity enhancements	3.1 Develop a plan for implementing recommended enhancements, with prioritised tasks and minimum disruption to users 3.2 Factor into the implementation plan the availability of finances, staff and other requirements 3.3 Submit the implementation plan to appropriate person for approval and revision

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ELEMENT	PERFORMANCE CRITERIA
4. Install capacity enhancements	4.1 Install capacity enhancements according to installation procedures, organisational guidelines and implementation plan 4.2 Measure the increase in capacity and performance resulting from installed equipment to assess whether capacity requirements have been met 4.3 Update documentation according to organisational guidelines to reflect the capacity enhancements
5. Monitor ongoing capacity requirements	5.1 Monitor and assess the impact of new technology and application development on capacity and performance 5.2 Implement and maintain a performance database 5.3 Review and assess benchmarks and performance regularly with work team to enable timely capacity enhancements and updates of benchmarks

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.3, 2.7, 5.3	• Researches and evaluates technical and non-technical information and numerical and financial data from a range of sources to determine benchmarks and performance indicators
Writing	1.5, 1.6, 2.1, 2.6, 2.7, 3.1-3.3, 5.2	• Accurately records information and numerical data, and prepares documentation using clear and accurate language to convey explicit information, requirements and recommendations
Oral Communication	1.5, 2.1, 3.3, 5.3	• Uses listening and questioning techniques to obtain and convey information
Numeracy	2.3- 2.5, 3.1, 3.2, 4.2, 5.1-5.3	• Uses mathematical equations to calculate, compare and estimate numerical and financial data required for forecasting and planning activities
Interact with others	1.5, 2.1, 2.7, 3.3, 5.3	• Selects and uses appropriate conventions and protocols when communicating with users, co-workers and others in a range of work contexts • Collaborates with others to achieve shared goals
Get the work done	1.1-1.6, 2.2-2.7, 3.1-3.3, 4.1, 5.1-5.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS417 Undertake ICT system capacity planning	ICASAS417A Undertake IT system capacity planning	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS417 Undertake ICT system capacity planning

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor and accurately assess current and future capacity requirements of a system and document outcomes
- predict and document capacity requirements, with forecasts being realistic and achievable
- plan and install capacity enhancements
- create and maintain required documentation.

Note: Evidence must be provided for at least TWO organisations or occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse and describe the system's current functionality
- outline the key features of:
  - component performance management
  - current industry accepted hardware and software products
  - financial analysis
  - client business domain
  - performance monitoring tools
  - quality assurance practices with regard to proposed Information and Communications Technology (ICT) capability enhancements
  - service level agreements relating to proposed ICT capability
  - enhancements
  - role of stakeholders and the degree of stakeholder involvement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment, materials and
- industry software packages
- live system
- service level agreements
- fault logs
- users
- hardware components for installation.

Assessor must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS418 Monitor and administer security of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and administer security functions of an information and communications technology (ICT) system.

It applies to experienced individuals who, while working under a level of supervision, have responsibility in a frontline technical support capacity to ensure organisational standards are met, and apply technical and specialised knowledge to maintain the security of a system.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Ensure user accounts are controlled	1.1 Modify default user settings to ensure they conform to security policy 1.2 Modify previously created user settings to ensure they conform to updated security policy 1.3 Ensure legal notices displayed at logon are appropriate 1.4 Check strength of passwords using the appropriate utilities and consider tightening rules for password complexity 1.5 Take action to ensure password procedures are reviewed with appropriate other internal departments 1.6 Monitor email to uncover breaches in compliance with legislation 1.7 Access information services to identify security gaps and take appropriate action using hardware and software or patches
2. Secure file and resource access	2.1 Review inbuilt security and access features of the operating system and consider need for further action 2.2 Develop or review the file security categorisation scheme, and develop an understanding of the role of users in setting security 2.3 Monitor and record security threats to the system 2.4 Implement a virus checking process and schedule for the server, computer and other system components 2.5 Investigate and implement inbuilt or additional encryption facilities
3. Monitor threats to the network	3.1 Use third-party software or utilities to evaluate and report on system security 3.2 Review logs and audit reports to identify security threats 3.3 Carry out spot checks and other security strategies to ensure that procedures are being followed 3.4 Prepare and present an audit report and recommendations to appropriate person 3.5 Obtain approval for recommended changes to be made

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.6, 1.7, 2.1, 2.2, 2.5, 3.1, 3.5	• Researches and analyses technical and non-technical information and system data from a range of sources to determine requirements and complete necessary actions
Writing	1.5, 2.2, 2.3, 3.1, 3.4	• Accurately records information and system data using required format, terminology and conventions specific to requirements • Prepares reports using concise language and correct spelling and grammar to convey explicit information, requirements and recommendations
Oral Communication	1.5, 3.1, 3.5	• Obtains information by listening and questioning, and participates in verbal exchanges with a range of personnel using detailed and clear language to contribute information and express requirements and recommendations
Numeracy	1.1, 1.2, 2.3-2.5, 3.1, 3.2	• Uses mathematical equations to calculate and compare system and numerical data to determine required actions and prepare reports and schedules
Interact with others	1.5, 3.4, 3.5	• Selects and uses appropriate conventions and protocols when communicating with others in a range of work contexts
Get the work done	1.1-1.7, 2.1-2.5, 3.1-3.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS418 Monitor and administer security of an ICT system	ICASAS418A Monitor and administer security of an IT system	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS418 Monitor and administer security of an ICT system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review user accounts for their security control
- identify security features available in the operating environment
- monitor, document and administer security functions on the system
- monitor threats to the network using:
  - third-party diagnostic tools
  - implementation of virus checking process and schedule
  - preparation of an audit report and recommendations.

Note: Evidence must be provided for at least TWO systems or occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of current industry accepted hardware and software products related to IT security
- discuss privacy issues and legislation with regard to IT security
- explain the key components of risk analysis process for system security
- describe the key features of specific security technology and systems technologies
- analyse the client business domain, including client organisation structure and business functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- the security policy
- industry and organisational standards
- a live system.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS419 Support system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to operate and support system software.

It applies to individuals who provide assistance and use technical and specialised knowledge and a systematic approach to tasks to ensure organisational standards are met in maintaining the operating system.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Maintain system software	1.1 Evaluate system effectiveness against organisational requirements and benchmarks to determine if maintenance activities should be commenced 1.2 Use system utilisation, file and disk structure, performance reports and files to identify peak periods and possible performance problems 1.3 Monitor system data levels to determine whether system performance is consistent with predetermined standards 1.4 Troubleshoot the system, if required, with appropriate system tools 1.5 Monitor and retune the system to improve performance
2. Set up and manage system files	2.1 Evaluate system requirements and monitor the appropriateness of file and folder structures 2.2 Use appropriate administration and tools to create file and folder structures 2.3 Set security, access and sharing of file system to meet requirements 2.4 Identify virus protection requirements of the network in line with policies and organisational requirements 2.5 Scan system for viruses and remove detected viruses 2.6 Test file system to ensure appropriate access is available to user groups 2.7 Ensure logon scripts and custom written utilities and programs conform to organisational guidelines for simple programming constructs 2.8 Document the file system created according to organisational guidelines
3. Monitor and manage system usage and security	3.1 Monitor user access against user access levels 3.2 Review security requirements for user and data to be stored on network 3.3 Determine risks that data is exposed to, and formulate appropriate prevention and recovery processes 3.4 Implement a system to provide backup and to restore services

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ELEMENT	PERFORMANCE CRITERIA
	in the event of a disaster 3.5 Document disaster recovery procedures
4. Carry out system backup	4.1 Confirm backup schedule meets organisational requirements 4.2 Ensure system backups are completed according to organisational, scheduling and system requirements 4.3 Ensure that a secure off-site location for the storage of backup media is provided and used 4.4 Ensure system backups are recorded according to organisational requirements
5. Restore system backup	5.1 Ensure system restores are completed when required for system recovery or testing according to organisational guidelines 5.2 Optimise the restored system according to organisational requirements 5.3 Ensure system restores are documented according to organisational requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.4, 2.5, 2.7, 3.1-3.3	Interprets and analyses technical and non-technical information and system data from a range of sources to determine requirements and complete necessary actions
Writing	2.8, 3.3, 3.5, 4.4, 5.3	Accurately records information and system data using required format, terminology and conventions specific to requirements Prepares reports using concise language and correct spelling and grammar to convey explicit information and requirements
Numeracy	1.2, 2.7, 2.8, 3.2, 5.3	Uses mathematical equations to calculate and compare system and numerical data to determine required actions and to prepare reports
Get the work done	1.1-1.5, 2.1-2.3, 2.5, 2.6, 2.8, 3.1, 3.3-3.5, 4.1, 4.2, 4.4, 5.1, 5.2	Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes Applies analytical processes to resolve technical or conceptual problems Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS419 Support system software	ICASAS419A Support system software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS419 Support system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor and document system software performance according to vendor and organisational benchmarks
- maintain system performance to these benchmarks
- use a wide range of features and system tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse and describe system software and system tools
- outline the key features of change management systems
- describe the client business domain
- describe the quality assurance practices with regard to supporting system software
- identify and describe vendor products and trends in product development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- special purpose tools, equipment and materials
- industry software packages
- organisational performance benchmarks
- live system
- client user requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS420 Provide first-level remote help desk support

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to resolve first-level user support difficulties or change requests remotely.

It applies to experienced individuals who, while working under a level of supervision, have responsibility in a frontline technical support capacity to exercise discretion and judgement using appropriate knowledge to provide assistance and remote help desk support to clients.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the user support issue	1.1 Determine the eligibility status of the individual experiencing the user support difficulty against organisational guidelines for user support services 1.2 Clarify the user support difficulty or change request with client, using active listening and questioning techniques where possible 1.3 Confirm the nature of the user support difficulty or change request with client, using technical language that is understandable by the client
2. Identify the hardware or software being used by the customer or client	2.1 Identify the software, hardware, network connection or application being used by the client 2.2 Identify the outcome the client is trying to achieve and the stage of the process they have reached, using active listening and questioning techniques 2.3 Step the client back to the beginning of the process using plain English 2.4 Walk the client through the process in a clear and logical manner
3. Confirm resolution of user support issue	3.1 Determine, describe and eliminate factors that may have created the user support issue or permit it to recur 3.2 Explain and guide the client through a complete recovery and resolution process for the issue or change request 3.3 Provide sufficient instruction to the client to enable effective handling and resolution of the issue, if it recurs 3.4 Offer next level escalation or lodgement of change request, explaining cost involved, if user request is not possible to resolve under current circumstances 3.5 Document changes where appropriate
4. Maintain communication link	4.1 Confirm resolution of difficulty with client according to client service policy 4.2 Confirm client satisfaction with the current service according to client service policy 4.3 Inform client of additional support or services available,

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ELEMENT	PERFORMANCE CRITERIA
	according to the organisation's client service policy 4.4 Provide the client with additional information related to products and services offered by the organisation, as required by the organisation's sales promotion requirements 4.5 Complete the client contact records according to the client service requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1	• Interprets and analyses technical and non-technical information from a range of sources to determine requirements and complete necessary actions
Writing	3.5, 4.5	• Accurately records client information using required format, terminology and conventions • Uses concise language and correct spelling and grammar to clearly convey explicit information and actions taken
Oral Communication	1.1-1.3, 2.1-2.4, 3.1-3.4, 4.1-4.4	• Uses active questioning and listening techniques to convey and clarify information and confirm understanding • Conveys complex technical information using clear and concise language pitched to a level that the client understands
Numeracy	3.4, 3.5, 4.4	• Uses mathematical equations to calculate costs and estimate time in providing client services and in determining required actions
Interact with others	1.2, 1.3, 2.2-2.4, 3.2-3.4, 4.1-4.4	• Selects and uses appropriate conventions and protocols when communicating with clients in a range of work contexts
Get the work done	1.1-1.3, 2.1, 2.3, 2.4, 3.1-3.4, 4.1-4.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS420 Provide first-level remote help desk support	ICASAS420A Provide first-level remote help desk support	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS420 Provide first-level remote help desk support

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the user difficulty and support required
- resolve first-level user support difficulties remotely
- demonstrate customer service skills
- obtain client feedback and document problem resolution.

Note: Evidence must be provided for at least TWO organisations/clients.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of customer service policies and procedures
- identify and discuss the range of contexts where escalation procedures are required
- identify the work health and safety (WHS) procedures related to the work environment and organisational requirements
- describe user support policies of limited complexity related to known or commonly used options.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the system administration and support field of work and include access to special purpose tools, equipment, materials and industry software packages including:

- customer service policies
- user support policies
- escalation procedures
- communications hardware.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS421 Support users and troubleshoot desktop applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to sustain users who run operating systems (OS) in a corporate or home environment.

It applies to individuals who provide frontline support to users and apply technical and specialised knowledge to fault finding and problem solving.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Install, configure and troubleshoot applications	1.1 Install application for client 1.2 Configure and customise application within user environment 1.3 Resolve application problems
2. Resolve issues related to usability, customisation and connectivity	2.1 Determine issues and problems experienced by the client 2.2 Research solutions to issues and problems 2.3 Recommend solutions to client 2.4 Resolve issues and problems
3. Configure application security	3.1 Identify and troubleshoot problems related to security permissions 3.2 Identify and respond to security incidents 3.3 Manage application security settings

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2, 3.1	• Researches and analyses complex technical and non-technical information from a range of sources to determine requirements and complete necessary actions
Writing	2.3	• Uses clear language and appropriate formats to convey and present explicit information
Oral Communication	2.3	• Participates in verbal exchanges using clear and concise language to convey and clarify complex technical information
Numeracy	1.2, 2.1, 3.3	• Uses mathematical equations to calculate and compare numerical data to solve problems and determine required actions
Interact with others	2.3	• Selects and uses appropriate conventions and protocols when communicating with clients in a range of work contexts
Get the work done	1.1-1.3, 2.1, 2.2, 2.4, 3.1-3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS421 Support users and troubleshoot desktop applications	ICASAS421A Support users and troubleshoot desktop applications	Updated to meet Standards for Training Packages. Minor changes to performance criteria for clarity.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS421 Support users and troubleshoot desktop applications

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- install, configure and troubleshoot computer applications
- customise computer applications
- anticipate and respond to a range of security incidents.

Note: Evidence must be provided for at least TWO users/situations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of operating systems (OS) and office applications including an analysis of the current system
- identify sources of OS patches
- discuss specific features of security incidents
- describe the key features of typical systems and procedures of user support.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to special purpose tools, equipment, materials and industry software packages, including:

- appropriate OS installation compact disk or recovery boot disks
- computers with application errors
- samples of operating system patches
- stand-alone or networked personal computer.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS422 Scope implementation requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to define boundaries and deliverables of a system installation project, in one location, in the context of an overall implementation plan.

It applies to individuals who apply specialised and technical knowledge to strategic initiatives and project planning.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine scope	1.1 Review project plan and other documentation 1.2 Determine installation requirements 1.3 Identify other implementation issues
2. Confirm scope with parties	2.1 Develop and document preliminary project scope and submit to appropriate person 2.2 Review requests for revision to scope 2.3 Identify areas for further development 2.4 Prepare implementation plan and forward to appropriate person
3. Update plans to account for scope	3.1 Review implementation plan, taking into account scope of system 3.2 Review key dates and events to determine if conflicts exist 3.3 Confirm revised plans and documents with appropriate person for final approval and sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.2, 2.3, 3.1, 3.2	• Researches and analyses complex technical and non-technical information from a range of sources to determine requirements and complete necessary actions
Writing	2.1, 2.4, 3.3	• Develops material for a specific audience using clear and detailed language and appropriate formats to convey explicit information, requirements and recommendations • Reviews and updates documentation based on feedback received
Oral Communication	3.3	• Participates in verbal exchanges using clear and concise language to convey and clarify complex technical information
Numeracy	1.1, 1.2, 2.1, 3.1, 3.2	• Uses mathematical equations to calculate, compare and estimate numerical and financial data required for planning and scheduling
Interact with others	2.1, 2.4, 3.3	• Selects and uses appropriate conventions and protocols when communicating with others in a range of work contexts
Get the work done	1.1-1.3, 2.1-2.4, 3.1-3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS422 Scope implementation requirements	ICASAS422A Scope implementation requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS422 Scope implementation requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare a project plan and implement an approach that addresses:
  - drivers
  - measures of success
  - implementation by functional area
  - coordination.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe project planning, including the scope and roles of individuals
- outline the key features of:
  - client business domain
  - information and communications technology (ICT) related services and issues
- identify and describe possible legislative requirements relating to cabling and building preservation
- describe the role of stakeholders and degree of stakeholder involvement
- summarise current trends in vendor products
- analyse and describe:
  - current industry accepted hardware and software products
  - prerequisites needed for system installation
  - vendor specifications and requirements for installation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to special purpose tools, equipment, materials and industry software packages, including:

- project documentation
- staff
- resources
- technical equipment.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS424 Support different operating systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to repair boot up procedures in a variety of operating systems (OS).

It applies to individuals who use technical and specialised knowledge and a systematic approach to troubleshooting and fault finding.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine organisation's help desk procedures	1.1 Review organisation's technical support procedures 1.2 Interrogate help desk system 1.3 Liaise with client
2. Identify OS	2.1 Examine operating system file and root structure 2.2 Identify profile information 2.3 Explore the help structure 2.4 Observe boot process
3. Differentiate OS	3.1 Compare and contrast features of OS 3.2 Examine kernel file structures 3.3 Determine currency of operating system
4. Analyse OS boot processes	4.1 Analyse boot procedures 4.2 Evaluate associated boot files 4.3 Itemise boot procedures for different operating procedures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.2	• Interprets and analyses complex technical information from a range of sources to determine requirements and complete necessary actions
Writing	1.3, 4.3	• Records information in the correct format, using accurate spelling and grammar, and terminology and conventions specific to requirements
Oral Communication	1.3	• Participates in verbal exchanges using clear and concise language to convey and clarify complex technical information
Numeracy	1.2, 3.3, 4.3	• Uses mathematical equations to calculate and compare numerical data required for troubleshooting and problem solving
Interact with others	1.3	• Selects and uses appropriate conventions and protocols when communicating with clients in a range of work contexts
Get the work done	1.1,1.2, 2.1-2.4, 3.1-3.3, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS424 Support different operating systems	ICASAS424A Support different operating systems	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS424 Support different operating systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review technical support procedures with client
- evaluate the functionality of the operating system (OS)
- differentiate the OS features, structure and currency
- analyse the OS boot processes and procedures.

Note: Evidence must be provided on at least TWO operating systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse boot processes in use
- identify and analyse files required for operation
- compare and contrast the key features of a range of OS.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to special purpose tools, equipment, materials and industry software packages, including:

- stand-alone or networked personal computer
- appropriate OS installation compact disk or recovery boot disks
- drivers for connected devices
- help-desk system.

Assessors must satisfy NVR/AQTF assessor requirements.

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Companion volumes available from the IBSA website:
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ICTSAS425 Configure and troubleshoot operating system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to configure, maintain and troubleshoot operating system (OS) software to ensure organisational requirements and client needs are met.

It applies to individuals who are required to install, configure, optimise and troubleshoot OS software to meet organisational requirements.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify available operating systems	1.1 Compare and contrast different OS 1.2 Identify and demonstrate knowledge of basic OS features 1.3 Research OS vendor sites to obtain technical specifications and system requirements 1.4 Install and configure the OS using features such as Internet Information Services (IIS) 1.5 Determine licensing, hardware and security requirements and provide recommendations to appropriate person
2. Install, configure and optimise operating systems	2.1 Install, configure and test the OS using the installation components and boot utility options 2.2 Use the OS user interface to correctly configure the installation 2.3 Identify different directory structures and demonstrate management of virtual memory 2.4 Optimise system to meet organisational requirements 2.5 Document system according to organisational requirements
3. Resolve problems using tools	3.1 Identify command line options and system tools available to troubleshoot problems 3.2 Identify specific problems and implement strategies for resolution 3.3 Use options and tools to resolve common operating system issues
4. Provide instruction for new operating system implementation	4.1 Provide one-to-one instruction about changes to the client or users as required 4.2 Obtain client evaluation about new system to ensure requirements are met, using appropriate feedback mechanism

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 1.5, 2.3, 3.1, 4.2	• Researches and analyses technical textual information and numeric data to source solutions and determine necessary actions
Writing	1.5, 2.5, 4.2	• Uses clear and technical language and formats appropriate to the task to record and convey information, requirements and recommendations
Oral Communication	1.5, 4.1, 4.2	• Uses clear and precise language to convey complex technical information and listening and questioning skills to obtain feedback from clients or users
Navigate the world of work	1.3	• Takes personal responsibility for following explicit and implicit policies, procedures and technical requirements
Interact with others	1.5, 4.1	• Selects and uses appropriate conventions and protocols when communicating with clients and others in a range of work contexts
Get the work done	1.1, 1.2, 1.4, 2.1-2.4, 3.1-3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS425 Configure and troubleshoot operating system software	ICASAS425A Configure and troubleshoot operating system software	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS425 Configure and troubleshoot operating system software

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the appropriate operating system
- install, configure and test an operating system (OS)
- improve system performance with minimum disruption to clients
- identify faults and rectify with utilities and tools
- instruct the client or users on the changes in OS
- seek client and user feedback.

Note: Evidence must be provided in at least TWO organisations or situations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the requirements of different operating systems
- outline the architecture of current technical systems
- identify and describe the key current industry accepted hardware and software products
- describe the functions and features of the OS used by the organisation
- describe the installation and configuration of systems software including:
  - organisational requirements for OS software
  - prerequisites for system software installation
  - set-up and configuration procedures
  - software packages supported by the organisation
  - system's current functionality
  - system's diagnostic software
  - vendor specifications and requirements for installation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the systems and administration support field of work, and include access to special purpose tools, equipment, materials and industry software packages including:

- personal computer where installation may be performed
- OS software
- technical documentation
- organisational documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to troubleshoot problems and apply systematic processes to fault finding across a wide range of information and communications technology (ICT) disciplines.

It applies to individuals who apply a systematic approach to finding faults, troubleshooting problems and solving issues in a wide range of ICT related areas.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Choose the most appropriate fault finding method	1.1 Develop a troubleshooting process to help resolve problems 1.2 Analyse and document the system that requires troubleshooting 1.3 Identify available fault finding tools and determine the most appropriate for the identified problem 1.4 Obtain the required fault finding tools 1.5 Identify legislation, health and safety requirements, codes, regulations and standards related to the problem area
2. Analyse the problem to be solved	2.1 Collect data relevant to the system 2.2 Analyse the data to determine if there is a problem and the nature of the problem 2.3 Determine specific symptoms of hardware, operating system and printer problems
3. Identify a solution and rectify the problem	3.1 Formulate a solution and make provision for rollback 3.2 Systematically test variables until the problem is isolated 3.3 Rectify the problem 3.4 Create a list of probable causes of the problem
4. Test system and complete documentation	4.1 Test the system to ensure the problem has been solved and record results 4.2 Identify and implement common preventative maintenance techniques to support ongoing maintenance strategies 4.3 Document the signs and symptoms of the problem and its solution, and load to database of problems or solutions for future reference

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.5, 2.1, 2.2	• Identifies, analyses and evaluates technical textual information and technical system data to source solutions and determine necessary actions
Writing	1.2, 3.4, 4.1, 4.3	• Records specific information relating to issues and outcomes in a sequential manner using correct grammar and spelling
Navigate the world of work	1.5	• Identifies and complies with organisational and legislative requirements
Get the work done	1.1-1.5, 2.1-2.3, 3.1-3.4, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Applies analytical processes to resolve technical or conceptual problems • Uses the main features and functions of digital tools to complete work tasks

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults	ICASAS426A Locate and troubleshoot IT equipment, system and software faults	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the most appropriate fault finding method
- document the troubleshooting process
- analyse and identify faults
- obtain suitable tools and equipment
- apply simple checks, tests and fault finding methodologies
- apply the recommended means to rectify fault and document results.

Note: Evidence must be provided for at least TWO organisations or situations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain client support and maintenance practices
- identify and describe current industry accepted hardware and software products, including features and capabilities
- discuss the system's current functionality, including details of the proposed system modifications
- describe one or more change management tools
- explain the key features of quality assurance practices with regard to locating and troubleshooting information and communications technology (ICT) equipment, system and software faults
- outline the change control procedures of the organisation
- describe a range of trouble shooting methodologies and system testing tools
- list and describe common symptoms of faulty ICT equipment
- identify and describe legislative, regulatory, standards or codes of practice that impact on the ICT service sector.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to special purpose tools, equipment, materials and industry software packages including:

- system to be diagnosed
- diagnostic and fault finding tools
- technical and system documentation
- organisational requirements for documenting solution.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS501 Develop, implement and evaluate an incident response plan

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and implement an incident response plan. The results of the incident response plan must be evaluated if they affect the mission of the organisation.

It applies to individuals who apply high-level technical skills and specialised knowledge to provide broad support functions in maintaining network service.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop the incident response program	1.1 Develop the incident management policy 1.2 Identify services the incident response team should provide 1.3 Create incident response plans according to security policy and organisational goals 1.4 Develop procedures for incident handling and reporting 1.5 Create incident response exercises and red-teaming activities 1.6 Develop specific processes for collecting and protecting forensic evidence during incident response 1.7 Specify incident response staffing and training requirements 1.8 Establish the response program
2. Implement the incident response program	2.1 Apply response actions in reaction to security incidents according to established policy, plans and procedures 2.2 Respond to and report incidents 2.3 Assist in collecting, processing and preserving evidence according to requirements 2.4 Execute incident response plans 2.5 Execute red-teaming activities and incident response exercises 2.6 Ensure lessons learned from incidents are collected in a timely manner and are incorporated into review plans 2.7 Collect, analyse and report incident management measures
3. Evaluate the incident response program	3.1 Assess efficiency and effectiveness of incident response program activities and implement changes as required 3.2 Examine effectiveness of red teaming and incident response tests, training and exercises 3.3 Assess effectiveness of communication between incident response team and related internal and external organisations, implementing changes where appropriate 3.4 Identify and implement improvements based on assessments of effectiveness

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Analyses textual information and data to determine necessary actions
Writing	1.1, 1.3, 1.4, 1.6-1.8, 2.2, 2.6, 2.7	• Uses clear and accurate language and documentation formats appropriate to the task
Oral Communication	1.7, 2.2	• Uses clear and accurate language to provide and obtain information relevant to the task
Numeracy	1.3, 2.7	• Accurately interprets, analyses and documents numerical and technical system data • Uses mathematical equations to calculate data for technical reports
Navigate the world of work	1.3, 1.4, 1.6, 2.1	• Works autonomously, making high-level decisions to achieve and improve organisational goals • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are met • Monitors and reviews the organisations policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	1.7, 2.2, 3.3	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships • Influences and fosters a collaborative culture facilitating a sense of commitment and workplace cohesion • Understands diversity and seeks to integrate diversity into the work context for managing change, making decisions and achieving shared outcomes
Get the work done	1.1-1.6, 1.8, 2.1-2.4, 2.6, 2.7, 3.1-3.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause • Explores new and innovative ideas to develop and

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		improve performance

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS501 Develop, implement and evaluate an incident response plan	ICASAS501A Develop, implement and evaluate an incident response plan	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS501 Develop, implement and evaluate an incident response plan

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and document an incident response program
- respond to an incident response activation and operation
- evaluate the incident response.

Note: Evidence must be provided on at least TWO occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the key features of:
  - client business domain
  - relevant workplace procedures and legislative requirements when formulating prevention and recovery strategy
  - systems engineering when evaluating threats
- analyse and describe:
  - backup methodologies
  - specific components of the business planning process relevant to the development of information and communications technology (ICT) business solutions
  - system functionality of a current business.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work and include access to:

- ICT business specifications
- information on the security environment, including relevant laws and legislation
- existing organisational security policies, organisational expertise and knowledge
- possible security environment, including threats to security that are, or are held to be, present in the environment
- risk analysis tools and methodologies
- ICT security assurance specifications
- incident scenarios.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS502 Establish and maintain client user liaison

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish and maintain client user liaison in an information and communications technology (ICT) environment, post support implementation. This occurs after the business critical functions have been determined.

It applies to individuals who are responsible for system and business analysis and administration, and liaising with clients to ensure that their requirements are fully met.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine support areas	1.1 Identify and record information communications technology used in the organisational unit 1.2 Identify stakeholders of the system 1.3 Identify organisational structure, culture and politics related to support requirements 1.4 Determine the level of support required by each organisational unit
2. Develop support procedures	2.1 Contact organisational units as required to verify support needs 2.2 Establish procedures for providing required support, including method of contact, frequency of meetings and reporting 2.3 Document agreed procedures or service level agreement (SLA)
3. Assign support personnel	3.1 Identify ICT skills required to assist each organisational unit with support activities 3.2 Assign personnel according to human resource processes 3.3 Verify availability of selected personnel 3.4 Provide support using agreed procedures 3.5 Obtain feedback from appropriate persons on a regular basis

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 3.1	• Comprehends textual information and numerical data to determine and adhere to required actions
Writing	1.1, 2.1, 2.3, 3.3, 3.5	• Records key information in the required format and layout, and develops material to a specific audience using clear and detailed language to convey explicit information, requirements and recommendations
Oral Communication	2.1, 3.3, 3.5	• Uses appropriate language, tone and pace to interact effectively with others, and listening and questioning techniques to obtain feedback relevant to the task
Navigate the world of work	3.2, 3.4	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation • Seeks to improve policies and procedures to better meet organisational goals
Interact with others	2.1, 3.2, 3.3, 3.5	• Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships • Influences and fosters a collaborative culture, and facilitates a sense of commitment and workplace cohesion
Get the work done	1.4, 2.1, 2.2, 3.4, 3.5	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS502 Establish and maintain client user liaison	ICASAS502A Establish and maintain client user liaison	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS502 Establish and maintain client user liaison

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish and maintain client liaison
- establish and document procedures for providing required support
- identify information and communications technology (ICT) skill requirements
- assign appropriate support personnel.

Note: Evidence must be provided in at least TWO ICT environments.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- specify adequate response times for providing services
- analyse the role of stakeholders in the organisation, and their level of dependence on ICT infrastructure
- explain the capabilities of a range of ICT devices
- research and evaluate current industry accepted hardware and software products
- identify and describe equipment that is vital in supplying business critical services, including:
  - internet file transaction security for client accounts
  - web server for e-business
- describe in detail the areas related to the organisation's services and the ICT system functionality required to supply the essential and desirable services to the organisation
- describe the quality assurance practices relating to the supplied service and service level agreements (SLAs)
- analyse the role of ICT in the client's business domain
- identify and describe server types to provide:
  - application
  - backup
  - email
  - firewall
  - proxy
  - web.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- agreed procedures or SLAs
- documented support requirements
- technical records and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS503 Perform systems tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that the properties of the entire system are tested and proved adequate before handover to the client or user for final acceptance testing.

It applies to experienced individuals employed in a range of information and communications technology (ICT) work environments who apply specialised and technical knowledge and systematic approaches to testing and fault finding.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for test	1.1 Prepare test environment 1.2 Determine software life cycle 1.3 Define test plan and appropriate test tools 1.4 Recognise and separate the system into runnable modules that mirror live scenarios 1.5 Gather and prepare logs and result sheets 1.6 Notify operations of scheduled test to ensure preparedness and understanding of implications for operations 1.7 Test scripts for online test or test run for batch test 1.8 Conduct walk-through to review expected results against acceptance criteria and system requirements documentation
2. Conduct test	2.1 Run test scripts and document results according to test and acceptance processes 2.2 Perform required quality benchmarks or comparisons for acceptance testing 2.3 Adopt organisation and industry standards 2.4 Compare actual results to expected results on completion of each system unit, and complete result sheets
3. Analyse and classify results	3.1 Summarise and classify results, highlighting critical or urgent areas of concern, and prepare report 3.2 Compare results against requirements 3.3 Notify operations of test completion 3.4 Log attendees' details or comments and gain required signatures 3.5 Schedule feedback meeting to discuss report and possible next actions with stakeholders, if necessary 3.6 Ensure test reporting complies with documentation and reporting standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.8, 2.2-2.4, 3.1, 3.2	• Interprets and analyses a range of textual information and numerical data to determine necessary actions
Writing	1.5, 1.6, 2.1, 2.4, 3.1, 3.4, 3.6	• Uses clear language to record and report technical information, and checks for accuracy at all times • Uses writing style and documentation formats appropriate to the task
Oral Communication	1.6, 3.3, 3.5	• Uses clear and accurate language to provide and obtain information relevant to the task
Numeracy	1.5, 1.8, 2.2, 2.4, 3.1	• Uses mathematical equations to calculate financial and technical data • Accurately records, analyses and documents numerical and technical system data
Navigate the world of work	2.3, 3.6	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation
Interact with others	1.6, 3.3, 3.5	• Influences and fosters a collaborative culture and facilitates a sense of commitment and workplace cohesion • Uses a variety of relevant communication tools and strategies to build and maintain effective working relationships
Get the work done	1.1, 1.3-1.5, 1.7, 1.8, 2.1, 2.2, 3.1, 3.5	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Applies systematic and analytical decision making processes for complex and non-routine situations • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS503 Perform systems tests	ICASAS503A Perform systems tests	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS503 Perform systems tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- test the operation and consistency of the total system prior to delivery according to system requirements, including testing:
  - performance
  - security
  - configuration sensitivity
  - start-up and recovery from failure modes
- analyse test results
- prepare reports in compliance with documentation and reporting standards.

Note: Evidence must be provided on at least TWO occasions or systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast the key features and processes of automated test tools
- analyse input and output requirements
- describe organisational practice and rules for preparing test
- describe particular system requirements and key features
- analyse underlying test data
- Identify and summarise industry standards appropriate to performing system tests.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- requirements and design documents
- human resources
- hardware and environments for system test use (all testing to be carried out on the same platform as the completed system; scheduled testing to be on the production platform; production environment is required as part of test preparation)
- system or application suitable for testing.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS504 Develop and conduct client acceptance test

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and conduct acceptance testing as part of the process whereby clients will determine whether to accept the system.

It applies to experienced individuals working in a range of information and communications technology (ICT) environments, who apply specialised and technical knowledge in the development of strategic initiatives and in performing or organising others to complete complex technical operations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify acceptance criteria and develop test plan	1.1 Review system requirements documentation and project plans to identify mandatory system objectives and optional criteria, and conditions for system acceptance 1.2 Develop test plan based on system requirements 1.3 Review and validate test plan based on mandatory criteria, conditions, and system objectives and requirements 1.4 Communicate test plan to client and prepare client for acceptance test 1.5 Notify appropriate person of the scheduled acceptance test
2. Perform functional testing on software modules	2.1 Prepare test environment for client use 2.2 Perform testing according to test plan and documentation 2.3 Execute each test cycle 2.4 Document errors, difficulties and problems
3. Validate test results against expected results	3.1 Record and investigate discrepancies and corrections according to project procedures and timeframe 3.2 Brief client on outcomes to ensure client understands test results 3.3 Monitor system performance as required 3.4 Reschedule required code changes or modifications
4. Obtain sign-off and acceptance	4.1 Confirm test results with client 4.2 Identify and document client concerns over system operation 4.3 Identify possible solutions to concerns and notify appropriate development staff as required 4.4 Confirm client approval and obtain sign-off 4.5 Seek and formalise agreement of involved parties regarding the rescheduling of further required maintenance

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3	• Interprets and analyses textual information and data from a range of sources to determine necessary testing and actions
Writing	1.2, 1.4, 1.5, 2.4, 3.1, 3.2, 4.1-4.5	• Uses clear and accurate language and documentation formats appropriate to different audiences/purposes to convey technical information
Oral Communication	1.4, 1.5, 3.2, 4.1-4.5	• Uses clear and accurate language to convey technical information to a range of personnel • Uses questioning and listening techniques to confirm understanding of testing arrangements
Numeracy	1.1, 2.4, 3.1, 4.1	• Uses mathematical equations to calculate financial and technical data and to organise schedules • Accurately interprets, analyses and documents numerical and technical system data
Navigate the world of work	1.3	• Identifies and acts on issues that contravene relevant policies, procedures and legal requirements
Interact with others	1.4, 1.5, 3.2, 4.1-4.5	• Selects, implements and manipulates communications systems, processes and practices for maximum impact • Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships • Influences and fosters a collaborative culture and facilitates a sense of commitment and workplace cohesion
Get the work done	1.1, 1.2, 2.1-2.3, 3.1, 3.3-3.5	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause • Uses digital technologies to manage business operations and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS504 Develop and conduct client acceptance test	ICASAS504A Develop and conduct client acceptance test	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS504 Develop and conduct client acceptance test

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a test plan based on system requirements and acceptance criteria
- undertake functional testing
- validate results and obtain client sign-off acceptance.

Note: Evidence must be provided on at least TWO systems.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast the key features and processes of automated test tools
- analyse key aspects of business rules and standards
- discuss client user requirements
- analyse the system or application being tested
- describe a range of testing techniques.
-

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- business requirements
- project documentation, including:
  - templates
  - standards
  - specifications
  - client user and technical manuals
  - test plan
- technical components of system, including:
  - software
  - hardware
  - network
- staffing resources, including development, operations and client user representatives
- system application suitable for testing
- functional test cases to satisfy the agreed acceptance criteria (acceptance tests relate to the functionality of the system as stated in the requirements specification).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS505 Review and update disaster recovery and contingency plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse the impact of the system on the organisation and carry out risk analysis, disaster recovery and contingency planning.

It applies to individuals who apply a wide range of higher level technical skills and systematic problem solving approaches in information and communications technology (ICT) related areas.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate impact of system on business continuity	1.1 Identify business critical functions and the security environment from documentation and from discussion with business area and project team 1.2 Identify critical data and software from documentation 1.3 Assess potential impact of business risk and threats on ICT systems 1.4 Identify and evaluate statutory requirements, commercial requirements and contingency possibilities according to specifications and cost constraints
2. Evaluate threats to system	2.1 Identify threats to the system, considering security analysis and internal and external business environment 2.2 Evaluate risk minimisation alternatives against specifications and cost constraints
3. Formulate prevention and recovery strategy	3.1 Evaluate prevention and recovery options to support critical business functions against business specifications and cost constraints 3.2 Review current operational procedures to ensure adequate risk safeguards and contingency plans are in place 3.3 Submit disaster recovery and prevention strategy to appropriate person for approval
4. Develop disaster recovery plan to support strategy	4.1 Identify and document resources required for disaster recovery according to specifications and cost constraints 4.2 Identify and document processes required for disaster strategy according to project standards 4.3 Identify cut-over criteria before initiating disaster plan 4.4 Document disaster recovery plan and submit to appropriate person for review and sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 3.2, 4.1, 4.3	• Researches and analyses textual information and technical data/specifications from a range of documentation and sources to inform the development of contingency plans
Writing	3.3, 4.1,4.2, 4.4	• Uses clear and accurate language and formats appropriate to the task to convey explicit technical information, systems data requirements and recommendations
Oral Communication	1.1	• Participates in a verbal exchange of ideas and elicits the view and opinions of others by listening and questioning
Numeracy	1.2, 1.4, 4.4	• Accurately interprets, analyses and documents numerical, financial and technical system data
Navigate the world of work	1.4, 2.1, 3.2, 4.2	• Develops and implements strategies to ensure organisational policies, procedures and regulatory requirements are met • Monitors and reviews the organisations policies, procedures and adherence to legislative requirements to implement and manage change
Interact with others	1.1, 3.3, 4.4	• Uses relevant communication tools and strategies in building and maintaining effective working relationships • Influences and fosters a collaborative culture that facilitates a sense of commitment and workplace cohesion
Get the work done	1.1, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS505 Review and update disaster recovery and contingency plans	ICASAS505A Review and update disaster recovery and contingency plans	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS505 Review and update disaster recovery and contingency plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a contingency plan that identifies threats and minimises down time for business critical functions
- develop clear and specific directions on how to handle serious down time
- coordinate, plan and articulate flexible logistics requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast backup methodologies
- explain the business planning process relevant to the development of information and communication technology (ICT) business solutions
- analyse the client business domain
- evaluate disaster recovery plan strategies and components, including:
  - physical security
  - system failure, accident or sabotage (hackers)
  - denial of service
  - virus attack
  - cyber attack
  - telecommunications failure
  - contingency arrangements
- interpret and analyse key workplace health and safety, legislative and organisational requirements relevant to the task
- evaluate the organisation's current systems functionality and systems engineering.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- vulnerability assessment and general definition of requirements
- acceptance test plan
- business impact analysis
- information technology security assurance specifications
- relevant statutory documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS506 Update ICT system operational procedures

Modification History

Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to assess, update and document the operational procedures required to use the information and communications technology (ICT) system.

It applies to individuals who apply technical and specialised knowledge and systematic approaches to documentation in a range of ICT related areas.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Assess technical and user documentation	1.1 Review current versions of technical and user documentation 1.2 Compare accuracy of technical and user documentation with current system functionality 1.3 Identify and document inaccuracies in the documentation
2. Update procedures	2.1 Determine operational procedure requirements using review outcomes 2.2 Develop or update operating procedures for the system 2.3 Submit proposed operating procedures to appropriate person
3. Update documentation	3.1 Review feedback and make appropriate changes 3.2 Update technical and user documentation to incorporate changes 3.3 Submit technical and user documentation to appropriate person for final approval 3.4 Distribute technical and user documentation as agreed with appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 3.1	• Interprets and analyses textual information and data to compare accuracy of content documentation and determine necessary actions
Writing	1.3, 2.2, 3.1, 3.2	• Develops material containing specific requirements using clear and technical language • Organises content and version control in a manner that supports the purpose of the document
Numeracy	1.1, 1.2	• Accurately interprets, analyses and documents numerical and technical system data
Interact with others	2.3, 3.3, 3.4	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships
Get the work done	1.2, 2.1, 2.2, 3.1, 3.3, 3.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS506 Update ICT system operational procedures	ICASAS506A Update IT system operational procedures	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS506 Update ICT system operational procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse system functionality
- review and update technical and user documentation for at least TWO systems or occasions
- develop procedures to operate systems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain
- explain current business practices related to preparing reports
- compare and contrast the key features and capabilities of current industry accepted hardware and software products
- describe documentation standards and tools
- discuss the role of stakeholders and the degree of stakeholder involvement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- system or project related documentation
- staffing resources
- documentation tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSAS507 Implement and evaluate systems for regulatory and standards compliance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement and evaluate the application of the principles, policies and procedures that enable an enterprise to meet applicable information security laws, regulations and standards to satisfy statutory requirements, perform industry-wide best practices, and achieve its information security program goals.

It applies to individuals who apply specialised and technical knowledge in developing strategic initiatives in an information and communications technology (ICT) work environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement compliance systems	1.1 Monitor and assess the information security compliance practices of personnel according to enterprise policy and procedures 1.2 Maintain ongoing and effective communications with key compliance stakeholders 1.3 Conduct internal audits to determine if information security control objectives, controls, processes, and procedures are effectively applied and maintained, and perform as expected
2. Evaluate compliance systems	2.1 Assess the effectiveness of enterprise compliance program controls against appropriate benchmarks 2.2 Assess the effectiveness of information security compliance process and procedures for process improvement and implement changes where appropriate 2.3 Compile, analyse and report performance measures

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1	• Interprets and analyses a range of complex textual information and data to determine necessary actions
Writing	1.2, 2.3	• Uses clear, accurate and concise language and appropriate formats to convey complex content for a range of audiences
Oral Communication	1.1, 1.2, 2.3	• Uses clear and precise language to explain and present information and obtain feedback relevant to the task and audience
Numeracy	1.3	• Accurately interprets, analyses and documents numerical and technical system data
Navigate the world of work	1.1, 1.3, 2.1	• Monitors and reviews the organisations policies, procedures and adherence to legislative requirements • Develops and implements strategies to ensure organisational policies, procedures and regulatory requirements are met
Interact with others	1.2	• Selects, implements and manipulates communications systems, processes and practices for maximum impact
Get the work done	1.1, 1.3, 2.1-2.3	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS507 Implement and evaluate systems for regulatory and standards compliance	ICASAS507A Implement and evaluate systems for regulatory and standards compliance	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS507 Implement and evaluate systems for regulatory and standards compliance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- monitor and assess information security compliance
- conduct internal audits
- assess the effectiveness of enterprise compliance
- compile, analyse and report performance measures.

Note: Evidence must be provided on at least TWO occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain
- compare and contrast the key security features and capabilities of current industry accepted hardware and software products
- research and report on the key features of legislation relating to information and communications technology (ICT) security
- evaluate the operating system, including strengths and weaknesses over lifetime of product
- discuss privacy issues and legislation relating to integrating legal requirements with ICT security.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- ICT business specifications
- information on the security environment, including laws or legislation, existing organisational security policies, organisational expertise and knowledge
- possible security environment, which includes threats to security that are, or are held to be, present in the environment
- risk analysis tools and methodologies
- ICT security assurance specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSAS509 Provide client ICT support services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to liaise with client users while providing information and communications technology (ICT) support.

It applies to individuals who apply high level technical and specialised knowledge in assisting users.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify support procedures	1.1 Identify support required by client 1.2 Review support-call documentation to identify client contact person 1.3 Review service level agreement (SLA) and appropriate procedures to determine action, and include escalation procedures 1.4 Verify support requirements with client contact
2. Undertake support	2.1 Provide support activity required by the client 2.2 Maintain communication with client contact throughout support activity by email, phone or other specific process 2.3 Document action taken for support activity 2.4 Acknowledge protocol differences during support activity
3. Gather feedback	3.1 Submit resolution documentation to client contact 3.2 Contact client to determine satisfaction with support process 3.3 Conduct follow up action, as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3	• Analyses textual information and data to determine client support
Writing	1.4, 2.2-2.4, 3.1, 3.2	• Uses clear and accurate language, and documentation formats appropriate to the task
Oral Communication	1.4, 2.2, 2.4, 3.2	• Obtains information by listening and questioning, and participates in verbal exchanges of information and solutions using concise and clear language
Numeracy	1.3, 2.3, 3.1	• Accurately interprets, analyses and documents numerical and technical system data
Navigate the world of work	1.3	• Reviews the organisation's policies, procedures and adherence to legislative requirements in order to implement and manage change
Interact with others	1.4, 2.2	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships
Get the work done	1.1, 1.3, 2.1, 3.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Gathers and analyses data and seeks feedback to improve plans and processes • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques experience and knowledge to focus in on root causes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS509 Provide client ICT support services	ICASAS509A Provide client IT support services	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS509 Provide client ICT support services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- undertake support services, including:
  - identifying support requirements and procedures
  - client contact
  - documenting support provided
  - liaise with user to obtain feedback
  - act on feedback as appropriate.

Note: Evidence must be provided for at least TWO clients.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain and importance of client contact
- compare and contrast the key features and capabilities of current industry accepted hardware and software products
- explain help desk and maintenance practices
- describe quality assurance practices relating to information and communications technology (ICT) support
- discuss the role of stakeholders and degree of stakeholder involvement
- evaluate current system functionality
- describe the structure and purpose of service level agreements (SLAs).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- SLAs
- escalation procedure/s
- documentation processes.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSAS510 Review and develop ICT maintenance strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to review, develop and set up maintenance strategies and supporting processes to achieve continuity of information and communications technology (ICT) operations and business functions.

It applies to individuals who apply specialised and technical knowledge in developing strategic initiatives and in performing or organising others to complete complex technical operations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify and analyse maintenance needs	1.1 Identify risks to business continuity due to system malfunction, including quantification of possible loss 1.2 Identify core business functions and determine the service requirements for those functions 1.3 Develop a maintenance philosophy to meet business needs and apply it to dealings with the client
2. Identify and analyse IT system components to be maintained	2.1 Review systems architecture and configuration documentation for currency 2.2 Conduct an equipment and software audit if appropriate information is not available 2.3 Determine and document the warranty status of components and software according to vendor, project or organisational requirements 2.4 Identify critical components and software, and document recommendations regarding possible service arrangements
3. Develop service level agreements	3.1 Determine the views and requirements of the client in order to identify maintenance requirements 3.2 Prepare service level agreements (SLAs) to match client user and business requirements
4. Formulate maintenance strategy	4.1 Examine maintenance options against cost constraints, risks to business continuity and SLAs 4.2 Identify a specific maintenance strategy based on cost, business and SLA requirements 4.3 Create a preventative maintenance schedule based on cost, business and SLA requirements 4.4 Negotiate a maintenance strategy with client and make changes to SLAs where necessary 4.5 Document the recommended procedure for approval from appropriate person according to organisational requirements
5. Define client and supplier processes and standards	5.1 Negotiate and create reporting procedures for service requests with client and suppliers 5.2 Determine response time standards with client and suppliers

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ELEMENT	PERFORMANCE CRITERIA
	5.3 Create escalation procedures with client and suppliers 5.4 Set up the help desk or other support function according to agreed standards and procedures and in line with industry best practices

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.3, 2.4, 4.1	• Interprets and analyses technical specifications and data and textual information from a range of sources to develop maintenance strategy
Writing	3.1, 3.2, 4.4, 4.5, 5.1-5.3	• Uses clear and accurate language and documentation formats appropriate to different audiences/purposes to convey technical and business information
Oral Communication	3.1, 4.4, 5.1-5.4	• Obtains information by listening and questioning and participates in verbal exchanges of information
Numeracy	1.1, 4.1-4.3, 5.1, 5.2	• Uses mathematical equations to calculate financial and technical data and to organise schedules • Accurately interprets, analyses and documents numerical and technical system data
Navigate the world of work	2.3, 4.5, 5.4	• Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements to implement and manage change
Interact with others	3.1, 4.4, 4.5	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships and negotiating solutions • Influences and fosters a collaborative culture to facilitate a sense of commitment and workplace cohesion
Get the work done	1.1-1.3, 2.1-2.4, 4.2-4.4, 5.1-5.4	• Develops plans to manage relatively complex routine and non-routine tasks with an awareness of how they might contribute to broader strategy and goals • Gathers and analyses data and seeks feedback to improve plans and processes • Makes high impact decisions in a complex and diverse environment, using input from a range of sources • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge to focus in on the root cause

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS510 Review and develop ICT maintenance strategy	ICASAS510A Review and develop IT maintenance strategy	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS510 Review and develop ICT maintenance strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and analyse maintenance needs
- determine maintenance strategies
- implement support processes for maintaining the continuity of information and communications technology (ICT) operations and business functions
- define standards required for helpdesk support.

Note: Evidence must be provided for at least TWO clients.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain and the features of the ICT system that support the client's business activity
- describe the key features of current industry accepted hardware and software products
- explain the information found in product warranty and service difficulty records
- research and document helpdesk and maintenance practices, including general composition and operation of information database for tracking hardware, software and operational issues
- describe how the system has been set up to process data and what data elements are stored
- explain quality assurance practices with reference to maintenance, warranty and repair of network equipment and software
- discuss relationships between the stakeholders and the service provider.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment, materials and industry software packages
- systems architecture documentation and
- warranty documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS511 Prioritise ICT change requests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse and prioritise change requests as part of managing information and communications technology (ICT) systems that undergo continual change.

It applies to experienced individuals who provide technical advice, guidance and leadership in resolution of specified problems, and may have responsibility for organising others.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Classify and monitor change requests	1.1 Receive and record change requests from the client or other sources 1.2 Classify and prioritise change requests according to business guidelines and service level agreements (SLAs)
2. Determine priority settings	2.1 Identify risks to business continuity and prioritise changes that reduce risks for implementation 2.2 Evaluate costs and benefits of implementing changes against the current system 2.3 Examine benefits and costs of how and when a change is made, including risks to business continuity 2.4 Schedule change analysis according to business down periods and periods of business-critical activities
3. Develop change analysis work plan to develop and implement changes	3.1 Analyse similar change requests that might be developed and implemented simultaneously 3.2 Determine impact to the system and organisation of methodology and timing of change 3.3 Notify reason for the change to key stakeholders 3.4 Determine resources necessary to carry out the change development, taking into account time and cost constraints 3.5 Develop a change plan based on change analysis 3.6 Review change-plan documentation to ensure it is completed according to system documentation standards 3.7 Forward change plan to appropriate person for consideration and decision
4. Confirm change plan is complete and satisfies client	4.1 Conduct feedback session with client groups to ensure change requirements are satisfactory 4.2 Complete follow-up work and make recommendations for changes in procedures or documentation

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.3, 3.1, 3.6	• Interprets and analyses technical specifications and data and textual information from a range of sources to develop maintenance strategy
Writing	1.1, 3.3, 3.5-3.7, 4.2	• Uses clear and accurate language and documentation formats appropriate to different audiences/purposes to convey technical and business information
Oral Communication	1.1, 3.3, 3.7, 4.1, 4.2	• Facilitates groups to present and collect information and gain consensus on concepts • Obtains information by listening and questioning and participates in verbal exchanges of information to negotiate solutions appropriate to a range of personnel and situations
Numeracy	2.2-2.4, 3.1, 3.2, 3.4, 3.6	• Uses mathematical equations to calculate financial and technical data and organise schedules • Accurately interprets, analyses and documents numerical and technical system data
Interact with others	3.3, 3.7, 4.1	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and stakeholders
Get the work done	1.2, 2.1-2.4, 3.1-3.6, 4.2	• Develops plans to manage relatively complex routine and non-routine tasks with an awareness of how they might contribute to broader strategy and goals • Uses problem solving techniques to analyse required outcomes in order to manage change to ICT systems

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS511 Prioritise ICT change requests	ICASAS511A Prioritise IT change requests	Updated to meet Standards for Training Packages. Minor edit to the competency title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS511 Prioritise ICT change requests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review change requests and prioritise according to business guidelines and service level agreements (SLAs)
- evaluate cost-benefit analysis, including risks to business continuity
- develop change analysis work plan
- review change procedures and make appropriate recommendations.

Note: Evidence must be provided for at least TWO clients or situations.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the client business domain
- analyse help desk and maintenance practices
- explain the quality assurance practices relating to information and communications technology (ICT) system changes
- discuss the role of stakeholders and the degree of stakeholder involvement
- compare and contrast key features and capabilities of current industry accepted hardware and software products, including change management tools
- analyse the system's current functionality
- describe the purpose and features of SLAs.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- sites on which change requests may be coordinated
- SLAs currently used in industry
- business guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS512 Review and manage delivery of maintenance services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to review and manage the delivery of maintenance services.

It applies to individuals with managerial experience and responsibility for supervising individuals working under their direct or indirect supervision.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review service standards	1.1 Review service level agreements (SLAs) 1.2 Identify actual fault reporting and restoration performance, and compare with SLAs to ensure they meet requirements 1.3 Record areas of discrepancy
2. Review infrastructure	2.1 Identify internal support and maintenance options 2.2 Undertake a review of infrastructure 2.3 Record areas of discrepancy
3. Determine and implement solutions	3.1 Compare service standards and infrastructure discrepancies, and identify gaps in existing service 3.2 Document discrepancies identified 3.3 Determine cost effective solutions and impact 3.4 Implement solutions
4. Organise reviews	4.1 Determine guidelines for regular reviews with stakeholders 4.2 Undertake reviews as per agreed guidelines 4.3 Document review process and submit to the stakeholder 4.4 Ensure effective reporting procedures are in place and used

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1	• Evaluates textual and numerical information from a range of documentation to inform maintenance requirements and solutions
Writing	1.3, 2.1, 2.3, 3.2, 4.1, 4.3	• Uses clear and precise language and document formats appropriate to the task to convey explicit information and instructions
Numeracy	3.3	• Calculates and compares whole numbers and decimals to estimate projected costs against budgets
Navigate the world of work	3.4, 4.2, 4.4	• Works independently and collectively in making decisions to achieve organisation outcomes in maintenance service delivery
Get the work done	1.2, 2.1, 2.2, 3.1, 3.3, 3.4, 4.1-4.4	• Accepts responsibility for planning, prioritising and sequencing complex tasks and workload • Uses problem solving techniques to analyse required outcomes in order to manage maintenance-service delivery

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS512 Review and manage delivery of maintenance services	ICASAS512A Review and manage delivery of maintenance services	Updated to meet Standards for Training Packages	Equivalent unit

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Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS512 Review and manage delivery of maintenance services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and report on faults and restoration performance
- comply with service level agreement (SLA)
- review infrastructure and document discrepancies
- analyse and prioritise requests according to business requirements
- implement cost effective solutions and evaluate impact.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe and explain business scheduling requirements
- discuss capacity planning and change-control procedures
- compare and contrast current industry accepted hardware and software products, including their general features and capabilities
- outline key features of the client business domain
- evaluate help desk and maintenance practices
- analyse the role of stakeholders and the degree of stakeholder involvement
- describe the system's current functionality and the features and functions of system under modification.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- sites on which review of maintenance-services delivery may be conducted
- established ICT service infrastructure
- SLAs and business guidelines.

Assessor must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS513 Develop detailed test plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan for testing information and communications technology (ICT) systems, including software development, systems administration, networking, and web development, by collating documentation of conditions and expected results sufficiently to allow for thorough system testing.

It applies to individuals who use technical and specialised knowledge and systematic approaches in performing or organising others to complete complex technical testing operations.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare test environment and gather tools	1.1 Determine structure of system and user accounts to understand the test environment 1.2 Determine areas to test and test objectives, according to organisational standards 1.3 Ensure accessibility of documentation 1.4 Notify user representatives or approval authorities of objectives and scheduled test 1.5 Notify operations staff of scheduled test to ensure preparedness and an understanding of implications
2. Prepare test data	2.1 Gather test schedules according to organisational standards 2.2 Correlate schedules with related functionality according to organisational standards 2.3 Check testing schedule prior to validation according to organisational standards 2.4 Prepare test drivers or stubs for test harness according to organisational standards 2.5 Register test plan and initiate log entries according to organisational standards
3. Complete test plan and acceptance processes	3.1 Use software metrics where appropriate 3.2 Validate test and acceptance processes 3.3 Ensure documentation and reporting comply with test plan and quality benchmarks

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1-2.3	• Analyses and evaluates textual and numerical information from a range of documentation to determine required action
Writing	1.4, 1.5, 3.3	• Uses clear and precise language and document formats appropriate to the audience and task to convey explicit information and instructions
Oral Communication	1.4, 1.5	• Uses clear and accurate language, and inclusive and collaborative techniques to convey information to a range of personnel
Numeracy	2.2, 2.5, 3.3	• Uses mathematical equations to calculate and compare numerical test data to determine required actions
Interact with others	1.4, 1.5	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and others
Get the work done	1.1-1.5, 2.1-2.5, 3.1-3.3	• Accepts responsibility for planning, prioritising and sequencing complex tasks and workload • Applies systematic and analytical decision making processes for complex and non-routine situations • Uses digital technologies to manage ICT operations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS513 Develop detailed test plans	ICASAS513A Develop detailed test plans	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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Assessment Requirements for ICTSAS513 Develop detailed test plans

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interpret software specifications
- develop a comprehensive test plan that documents:
  - test conditions or cases to be applied
  - data to be processed
  - automated testing coverage
  - expected results
  - activities, dependencies and effort required to conduct the system test.

Note: Evidence must be provided for at least TWO systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe key features of at least three different operating systems, with detailed knowledge of operating systems relevant to project requirements
- compare and contrast key features of automated test tools, with detailed knowledge of features and processes of tools relevant to the project
- discuss organisational requirements, including a testing schedule
- analyse system or application being tested
- describe quality benchmarks appropriate for testing
- describe testing techniques and process relevant to the project.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- system engineering management plan
- test and evaluation program plan
- system or application suitable for testing plus its associated documentation
- organisational plans and documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS514 Perform integration tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that the components of the system operate together to the expected standard.

It applies to senior development staff who are responsible for ensuring that sub-systems function correctly when combined.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for test	1.1 Prepare test environment 1.2 Prepare test scripts (online test) or test run (batch test) for running 1.3 Review expected results against test and acceptance criteria 1.4 Confirm pre-existing modules and compile modification logs 1.5 Perform static tests of each point of integration and verify correctness of arguments, positional parameters and return values in each integration suite 1.6 Review results of earlier component testing and ensure critical issues are identified and considered
2. Conduct test	2.1 Select appropriate test tools 2.2 Run test scripts and document results against software life cycle model 2.3 Ensure that memory leakage, global name-space pollution and static variables are specifically addressed for each integration unit in line with test and acceptance criteria 2.4 Follow and adopt integration standards where appropriate in line with quality benchmarks 2.5 Compare test results to requirements on completion of each integration component
3. Analyse and classify results	3.1 Summarise and classify test results and highlight areas of concern 3.2 Compare test results against requirements and design specification, and prepare report 3.3 Notify operations of completion of testing where appropriate 3.4 Ensure attendees' details and comments are logged and signatures gained 3.5 Schedule and conduct a feedback meeting to discuss report and possible next actions with stakeholders if necessary 3.6 Ensure test reporting complies with documentation and reporting standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.6, 2.5, 3.2	• Analyses and evaluates textual and numerical information from a range of documentation to determine required action
Writing	2.2, 3.1-3.4, 3.6	• Accurately records information and system data using required format, terminology and conventions specific to requirements • Prepares reports using concise language and correct spelling and grammar to convey explicit information, requirements and recommendations
Oral Communication	3.3-3.5	• Uses clear and accurate language and inclusive and collaborative techniques to convey and obtain information from a range of personnel
Numeracy	1.3, 1.4, 2.5, 3.1	• Uses mathematical equations to calculate, compare and evaluate numerical test data to determine required actions
Interact with others	3.3-3.5	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and stakeholders
Get the work done	1.1-1.6, 2.1-2.5, 3.1-3.6	• Develops plans to manage relatively complex routine and non-routine tasks with an awareness of how they might contribute to broader strategy and goals • Uses problem solving techniques in analysing required outcomes to perform integration tests • Uses digital technologies to manage information and communications technology (ICT) operations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS514 Perform integration tests	ICASAS514A Perform integration tests	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS514 Perform integration tests

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare the test environment
- conduct tests using appropriate test tools and integration standards and quality benchmarks
- perform integration requirements for the units
- determine whether the units operate according to specifications
- analyse and classify results
- prepare reports that comply with documentation and reporting standards.

Note: Evidence must be provided on at least TWO systems or occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the key features of at least two programming languages, with detailed knowledge of programming languages required by current system/project
- compare and contrast automated test tools, with detailed knowledge of features and processes of tools used for current system/project
- identify input and output requirements
- discuss organisational practice, standards and benchmarks relating to integration testing
- analyse and describe the system or application being tested
- describe key features and processes of testing techniques and tools
- analyse underlying test data.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- acceptance criteria
- test plan
- integration standards
- requirements and design documents used in test analysis
- system or application suitable for testing.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS515 Manage the testing process

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to effectively manage and administer the end-to-end testing process, including test definition, execution and reporting.

It applies to experienced individuals who work autonomously in performing or organising others to complete complex technical operations.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop test schedule	1.1 Determine testing requirements and objectives 1.2 Review test plan, where available 1.3 Develop testing timeline and allocate resources 1.4 Document test objectives and schedule according to test procedures and distribute to appropriate person 1.5 Obtain feedback and incorporate relevant changes
2. Complete test procedures	2.1 Copy necessary code into the testing environment 2.2 Allocate and manage personnel carrying out the testing process 2.3 Administer alterations or changes to the code 2.4 Integrate code into production environment
3. Review the completeness and accuracy of the system	3.1 Administer full system test to ensure suitability of the system 3.2 Document outcomes of system test for use in subsequent development phases 3.3 Evaluate results of system test to determine acceptability of system

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Compares and evaluates textual information and numerical data/specifications from a range of documentation to inform testing requirements
Writing	1.3-1.5, 2.3, 3.2	• Uses technically specific language and a range of writing styles to articulate requirements • Uses appropriate formats and structures to present information logically for different audiences and revises documents based on feedback and outcomes
Oral Communication	1.5, 2.2	• Explains technical requirements and plans to relevant personnel, using clear and precise language and listening and questioning skills to confirm understanding
Interact with others	1.4, 1.5, 2.2	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and others
Get the work done	1.1-1.5, 2.1-2.4, 3.1-3.3	• Develops plans to manage relatively complex routine and non-routine tasks with an awareness of how they might contribute to broader strategy and goals • Uses problem solving techniques to analyse required outcomes in order to manage the testing process • Uses digital technologies to manage operations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS515 Manage the testing process	ICASAS515A Manage the testing process	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS515 Manage the testing process

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a test schedule
- manage the testing procedure and process
- review the system based on test outcomes to determine acceptability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast testing techniques and automated test tools, explaining the key features and processes of each
- describe the key features of organisational procedures relating to the testing process
- explain system requirements describing key requirements and features
- analyse the system or application being tested.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- human resources
- requirements and design documentation
- test plan
- test hardware and environments (testing to be carried out on the same platform as the completed system, with scheduled testing to be on the production platform and the production environment required as part of test preparation)
- system or application suitable for testing.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS516 Perform stress and load tests on integrated platforms

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and perform tests to ensure the ability of a system to cope with expected high levels of data volume.

It applies to experienced individuals who provide specialised and technical knowledge in completing complex technical operations to ensure that the proposed system can handle anticipated loads.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create test plan	1.1 Determine scope, objectives and specific tests to place load on the system, including expected results and performance impact 1.2 Determine and document standards for acceptance and compliance with client 1.3 Determine and document clear responsibilities and contact points with third party suppliers for support 1.4 Identify testing resources and tools from a range of available sources 1.5 Identify and record base-system loads or level of activity against which the test will be measured 1.6 Identify processes or steps in test, including automated testing 1.7 Assemble test plan documentation and distribute to appropriate person
2. Undertake test	2.1 Implement test plan according to test plan sequencing 2.2 Confirm that each technology component operates correctly within integrated platform 2.3 Confirm that integrated platform operates to project and industry standards 2.4 Undertake documentation of testing outcomes to meet project standards 2.5 Detect faults
3. Diagnose and resolve faults	3.1 Identify and document faults according to project plan 3.2 Diagnose faults and take corrective action 3.3 Manage problem resolution processes according to project procedures 3.4 Enforce compliance standards with third party suppliers as required
4. Update documentation	4.1 Update appropriate project and system documentation to record and present test findings to development staff for their attention, if test is unsuccessful

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4	• Interprets and analyses a range of textual information and numeric data from a range of technical sources to determine necessary actions
Writing	1.2-1.5, 1.7, 2.4, 3.1, 3.5, 4.1	• Develops technical and procedural documentation using clear and precise language and numerical data to convey test outcomes, requirements and recommendations
Oral Communication	1.3, 4.1	• Uses clear and precise language to convey and present complex technical information to a range of personnel • Uses questioning and listening techniques to confirm understanding, gain consensus on concepts and clarify responsibilities
Numeracy	1.1, 1.5, 2.2, 4.1	• Uses mathematical equations to calculate numerical data and compare test outcomes
Interact with others	1.3, 1.7, 3.4, 4.1	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and others
Get the work done	1.1-1.6, 2.1-2.5, 3.1-3.4	• Develops plans to manage relatively complex routine and non-routine tasks with an awareness of how they might contribute to broader strategy and goals • Uses problem solving techniques to analyse required outcomes to perform stress and load tests • Uses digital technologies to manage information and communications technology operations

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSAS516 Perform stress and load tests on integrated platforms	ICASAS516A Perform stress and load tests on integrated platforms	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSAS516 Perform stress and load tests on integrated platforms

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create a test plan and undertake a test that includes analysis of the system's ability to cope with expected high levels of data volume within predetermined performance standards
- identify problems and fault-resolution strategies that may occur during stress testing
- check that the system operates in the manner expected under expected conditions
- check that supporting material, including procedures and forms, is accurate and suitable for the purpose intended
- determine that stated conditions reflect the upper limits expected by client
- ensure there are no unacceptable reductions in service
- ensure individual elements and the overall system provide the desired result or functionality
- complete and update documentation accurately.

Note: Evidence must be provide on at least TWO occasions or systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast the key features and processes of automated test tools
- analyse organisational requirements relating to stress and load testing
- evaluate program design and performance characteristics
- describe system or application requirements and performance
- describe key features and processes of testing techniques.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- business requirements
- project documentation, including templates, standards, specifications and client user and technical manuals
- business rules and expected loads
- base tools
- technical components of system, including software, hardware and network
- staffing resources, including development, operations and client user representatives
- system or application suitable for testing.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSAS517 Use network tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use tools to assist in managing a network effectively.

It applies to individuals who apply technical and specialised knowledge to monitor security and resolve issues for the network.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use command line tools	1.1 Analyse command-line environment 1.2 Differentiate command-line and graphical user interface (GUI) systems 1.3 Identify command-line tools 1.4 Apply command-line tools in GUI environment
2. Use hardware tools	2.1 Identify appropriate hardware tools and their function 2.2 Review work health and safety (WHS) requirements for tool use 2.3 Manage network using hardware tools 2.4 Analyse test results
3. Use software tools	3.1 Identify appropriate software tools for network security 3.2 Determine areas of vulnerability 3.3 Classify function of each tool 3.4 Manage network using software tools 3.5 Analyse test results

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2, 3.1	• Identifies and interprets textual information and numerical data from a range of sources to determine necessary actions
Writing	1.3	• Records textual and numerical data in format specific to requirements
Numeracy	3.5	• Uses mathematical equations to calculate numerical data and compare test outcomes
Get the work done	1.1-1.3, 2.1, 2.3, 2.4, 3.1-3.5	• Accepts responsibility for planning, prioritising and sequencing complex tasks and workload • Uses problem solving techniques to analyse required outcomes and manage the network • Uses digital technologies to manage network operations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS517 Use network tools	ICASAS517A Use network tools	Updated to meet Standards for Training Packages. Minor edits to the performance criteria for clarity.	Equivalent unit

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Assessment Requirements for ICTSAS517 Use network tools

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- to manage a network effectively
- identify and use appropriate hardware and software tools:
- monitor network performance
- identify network threats
- isolate security breaches.

Note: Evidence must be provided on at least TWO networks or occasions.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe available network tools
- explain processes and techniques related to using network tools
- analyse key features of the range of attacks that affect network security
- discuss key problems and challenges relating to network security.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- hardware and software tools
- security diagnostic software
- maintenance procedures
- network system.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSAS518 Install and upgrade operating systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to maintain, install new and upgrade existing operating systems (OS) in a medium to large organisation.

It applies to individuals who apply technical and specialised knowledge to undertake complex support operations.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine organisational help desk procedures	1.1 Review organisation's technical support procedures 1.2 Interrogate help desk system 1.3 Liaise with client
2. Install or upgrade a desktop OS	2.1 Install an OS 2.2 Upgrade an existing OS 2.3 Research and implement automated OS installation techniques and procedures 2.4 Migrate files
3. Manage and troubleshoot resource access	3.1 Configure local resources access 3.2 Configure sharing of local resources 3.3 Assign access rights to shared resources
4. Configure and troubleshoot hardware devices and drivers	4.1 Determine and resolve problems with hardware resources 4.2 Research and install appropriate device drivers 4.3 Configure hardware resources 4.4 Configure device drivers
5. Configure and troubleshoot the desktop and user environments	5.1 Construct profiles for users 5.2 Organise shortcuts 5.3 Arrange screen management

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.3, 3.1-3.3, 4.2	• Interprets and analyses a range of textual information and numerical data from a range of technical sources to determine necessary actions
Writing	1.3	• Uses clear and precise information and numerical data in appropriate formats to convey information to clients/users
Oral Communication	1.3	• Uses clear and accurate language to convey technical information to clients/users
Numeracy	1.1, 2.3, 4.2	• Interprets and applies numerical data in source materials relevant to the activity
Interact with others	1.3	• Identifies and uses appropriate conventions and protocols when communicating with clients
Get the work done	1.2, 2.1-2.4, 3.1-3.3, 4.1-4.4, 5.1-5.3	• Accepts responsibility for planning, prioritising and sequencing complex tasks and workload • Uses problem solving techniques to analyse required outcomes to manage client operating systems • Uses digital technologies to manage information and communications technology (ICT) operations

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS518 Install and upgrade operating systems	ICASAS518A Install and upgrade operating systems	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTSAS518 Install and upgrade operating systems

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine organisation operating systems (OS) requirements
- install or upgrade OS
- customise OS to user requirements
- manage and configure hardware devices
- manage and configure desktop.

Note: Evidence must be provided for at least TWO operating systems.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain procedures and techniques involved in the installation and upgrade of OS
- explain procedures and principals involved in unattended OS installation
- describe OS configuration issues that may arise with hardware and desktop environments.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- stand-alone or networked personal computers
- appropriate OS installation compact disk or recovery boot disks
- drivers for connected devices
- helpdesk system
- OS service packs.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSAS601 Implement change management processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply techniques that facilitate the planning, implementation and monitoring of information and communications technology (ICT) change.

It applies to experienced individuals who provide specialised technical advice, guidance and leadership in a range of areas requiring change-management in ICT systems.

No licensing, legislative, or certification requirements apply to this unit at the time of publication.

Unit Sector

Systems administration and support

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan ICT system changes	1.1 Research and develop change procedures and conventions 1.2 Develop ICT change management plan 1.3 Identify key personnel responsible for change management policy and procedures 1.4 Train staff and management in change management procedures and policies 1.5 Evaluate current ICT system to determine changing user or business patterns 1.6 Identify key personnel responsible for authorising and implementing change management plan
2. Identify technology system change needs	2.1 Determine current ICT benchmarks 2.2 Compare identified needs against performance benchmarks to identify possible changes 2.3 Assess proposed changes to determine impact 2.4 Notify key personnel of necessary change
3. Implement change	3.1 Plan change schedule 3.2 Prioritise changes and allocate resources 3.3 Implement change management plan and procedures 3.4 Involve stakeholders in the implementation process 3.5 Capture new performance benchmarks to measure changes 3.6 Ensure appropriate liaison methods are used 3.7 Identify training requirements 3.8 Notify stakeholders of change
4. Monitor and review implementation	4.1 Measure change performance against new benchmarks 4.2 Submit performance results to stakeholders 4.3 Obtain sign-off on changes 4.4 Provide appropriate documentation and reporting

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2	• Interprets and analyses a range of textual information and numerical data from a range of technical sources to determine necessary actions
Writing	1.1, 1.2, 2.4, 3.8, 4.2, 4.4	• Uses clear and accurate language and documentation formats appropriate to different audiences/purposes to convey technical and non-technical information
Oral Communication	1.4, 2.4, 3.4, 3.8	• Uses inclusive and collaborative techniques to share, promote and convey information about new systems and changes to a range of personnel
Numeracy	1.5, 2.2, 3.1, 3.5, 4.1, 4.4	• Uses mathematical equations to calculate and compare numerical data against benchmarks and to plan and organise schedules
Navigate the world of work	3.3, 3.6, 4.3	• Takes a lead role in the development and facilitation of change management in an ICT environment
Interact with others	1.4, 2.4, 3.4, 3.6, 3.8, 4.2, 4.3	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships
Get the work done	1.2, 1.3, 1.5, 1.6, 2.1-2.3, 3.1-3.3, 3.5, 3.7, 4.1, 4.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Addresses complex problems involving multiple variables, using formal analytical, lateral thinking techniques, experience and knowledge • Uses digital technologies to manage business operations and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSAS601 Implement change management processes	ICASAS601A Implement change management processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTSAS601 Implement change management processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and plan information and communications technology (ICT) system changes
- implement, monitor and review ICT system changes, including:
  - applying guidelines and policies to the change management process
  - maintaining appropriate version control
  - maintaining compliance with existing accessibility and other policies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss key change management principles
- compare and contrast key functions and features of current information technology systems
- describe internet and internetworking architecture
- explain principles and structure of performance benchmarking
- analyse server access security procedures and general security issues relating to a particular operating system
- discuss methods of communicating change to stakeholders.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the systems administration and support field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- international standards
- operational data from an organisation
- needs analysis data
- organisational planning guidelines
- version control guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTSUS801 Plan and manage virtualisation for ICT sustainability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse, plan and manage options using virtualisation and managed services for organisational processes to meet sustainability targets.

It applies to individuals who have responsibility for conducting or managing information and communications technology (ICT) infrastructure projects, such as network managers, ICT infrastructure managers, network planners and designers, consultants or contractors.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop organisational plan to implement ICT virtualisation	1.1 Critically analyse current enterprise operations to determine what processes or practices can be realised using virtualisation to ensure long-term sustainability within organisational guidelines 1.2 Research and analyse alternative virtualisation scenarios, including risk analysis and relative comparisons of each, considering return on investment (RoI) 1.3 Produce results of analysis, prioritising sequence of processes to be virtualised based on enterprise priorities and setting of sustainability targets for organisation
2. Manage strategies for deploying virtual machines	2.1 Critically analyse business factors that cause enterprises to migrate to virtualisation 2.2 Identify virtualisation inhibitors preventing organisation from deploying strategies on local virtual machines 2.3 Produce virtualisation management plan to capitalise on using virtual machines according to enterprise priorities
3. Manage outsourced services and cloud networks	3.1 Critically analyse ICT requirements of organisation to produce cloud architecture, using multiple cloud computing elements indicating layers of cloud client stack 3.2 Produce cost–benefit analysis 3.3 Produce analytical justifications that will determine deployment model to meet business requirements of organisation 3.4 Establish service level agreement (SLA) with managed services provider (MSP) or network provider to ensure responsibilities of stakeholders are specified and agreed to

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.1, 3.3	• Critically analyses documentation from a variety of sources and records and consolidates information to determine requirements
Writing	1.2, 1.3, 2.3, 3.3, 3.4	• Prepares analytical reports, management plans and SLAs, and documents technical requirements and procedures for a diverse range of people in required format
Numeracy	1.2, 3.2	• Analyses and confirms capacity and interoperability requirements, calculates cost–benefit analysis and produces budget requirements and limitations
Navigate the world of work	1.1, 1.3, 2.3, 3.3	• Works autonomously, making high level decisions to achieve and improve organisational goals • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements to implement and manage change
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.3, 3.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context, in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Makes high impact decisions in a complex and diverse environment, using input from a range of sources • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals • Uses digital technologies to manage business operations and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSUS801 Plan and manage virtualisation for ICT sustainability	ICASUS701A Plan and manage virtualisation for IT sustainability	Updated to meet Standards for Training Packages. Minor edit to the competency title. Recoded and minor changes to performance criteria to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTSUS801 Plan and manage virtualisation for ICT sustainability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop an effective plan for virtualisation and manage strategies, including managed services
- determine and meet client requirements for installation and testing of virtual server
- perform information and communications technology (ICT) power-consumption calculations
- install, integrate and test virtualisation components according to vendor and technical specifications
- produce an accurate cost-benefit analysis and virtualisation management plan for justification
- establish an effective service level agreement (SLA).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- research and specify best practice approaches relevant to sustainability
- contrast common business processes, including:
  - relevant organisational policies, procedures and protocols
  - relevant systems and procedures to aid in the achievement of workplace sustainability
- determine the client business domain, including client organisational structure and business functionality
- define cloud computing architecture
- outline compatibility issues and resolution procedures
- specify the configuration of internet protocol (IP) networks
- critique current industry-accepted products
- research and specify energy consumption and energy audit methodologies
- outline environmental and sustainability legislation, regulations and codes of practice applicable to the industry and organisation
- explain the environmental impact of products, processes, systems and services
- explain linkage between policies and the development of processes and practices
- explain principles, practices and available tools and techniques of sustainability management relevant to the ICT industry
- describe quality assurance systems relevant to own organisation
- identify a range of relevant managed services, including software, network and support
- describe technologies and other requirements relevant to virtualisation, including:
  - cloud computing
  - power supply requirements and management
  - server design and network architecture
  - set-up and configuration procedures
  - single and multiple processors
  - vendor specifications and requirements for software installation
  - virtual server functionality
  - system diagnostics
  - using software simulation.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the sustainability field of work and include access to:

- relevant documentation
- current server virtualisation
- site and equipment on which servers can be virtualised.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSUS802 Conduct a business case study for integrating sustainability in ICT planning and design projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish a business case to justify innovative implementation of sustainability in information and communications technology (ICT) planning and design projects, including accessing industry information and applying legislative guidelines.

It applies to individuals who may be working in a role as a project manager, planner and designer, consultant or contractor and who has responsibility for conducting or managing ICT projects to plan and conduct cost–benefit analysis and return on investment for the implementation of sustainable schemes at the enterprise level.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Scope project for establishing business case for integrating sustainability in ICT project	1.1 Critically analyse proposed ICT project specifications to determine scope and extent of sustainability integration in design aspects 1.2 Critically analyse and evaluate expected goals of project and relate business case to broader organisational goals 1.3 Research appropriate sources of information relevant to project to prepare business case for validation with stakeholders
2. Plan and conduct business case for sustainable ICT project	2.1 Evaluate critical success factors to determine vital strategy for project to implement sustainability and gain competitive advantage 2.2 Produce estimate of costs projected over appropriate time period and determine potential for return on investment for proposed design and implementation plan 2.3 Conduct cost–benefit analysis to determine financial gain of derived overall benefit obtained by integrating sustainability into project 2.4 Produce executive summary for stakeholders on proposal, including risk analysis if sustainability component activity is not implemented
3. Devise management strategies for integrating sustainability into ICT project	3.1 Initiate and progress sustainable management principles that result in reduced environmental impact 3.2 Establish, regularly review and improve key performance indicators (KPIs) on sustainability performance 3.3 Incorporate innovative planning and design rules for ICT projects that foster sustainability and environmental best practice 3.4 Produce energy usage projection using estimated carbon dioxide emissions with comparable benchmarks and provide detailed report to support long-term benefits

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	2.2, 2.3, 2.4, 3.2, 3.3	• Generates complex written reports, business cases and executive summaries, demonstrating control over a broad range of writing styles and purposes • Prepare documents requiring precise expression, language and structures suited to intended audience
Numeracy	2.2, 2.3	• Analyses and synthesises highly embedded mathematical information for business case, budgets, workforce requirements and related sustainability benchmarks
Navigate the world of work	3.1, 3.3, 3.4	• Works autonomously, making high level decisions to achieve and improve organisational goals • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements to implement and manage change
Interact with others	2.4	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships • Influences and fosters a collaborative culture, facilitating a sense of commitment and workplace cohesion • Understands diversity and seeks to integrate diversity into the work context for managing change, making decisions and achieving shared outcomes
Get the work done	1.1-1.3, 2.1, 2.3, 2.4, 3.1-3.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Identifies key factors that impact on decisions and their outcomes, drawing on experience, competing priorities and decision-making strategies where appropriate • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals • Uses digital technologies to manage business operations and actively investigates new technologies for strategic and operational purposes

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTSUS802 Conduct a business case study for integrating sustainability in ICT planning and design projects	ICASUS702A Conduct a business case study for integrating sustainability in IT planning and design projects	Updated to meet Standards for Training Packages. Minor edits to the competency title. Recoded and minor changes to performance criteria to meet AQF requirements.	Equivalent unit

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Assessment Requirements for ICTSUS802 Conduct a business case study for integrating sustainability in ICT planning and design projects

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish an effective business case to introduce or improve sustainability in an information and communications technology (ICT) project
- produce an accurate cost–benefit analysis showing overall benefit of integrating sustainability into an ICT project
- devise, implement and review management strategies showing a measurable improvement using the chosen benchmark indicators.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare best practice approaches relevant to sustainability
- research and contrast energy consumption and energy audit methodologies
- research and critically evaluate environmental and sustainability legislation, regulations and codes of practice applicable to the industry and the organisation
- evaluate the environmental impacts of products, processes, systems and services
- interpret global and national initiatives, legislation, policies and guidelines relevant to project
- research and critique the principles, practices and available tools and techniques of sustainability management relevant to the ICT industry
- explain quality assurance systems relevant to own organisation
- formulate the relevant organisational policies, procedures and protocols required to assist in achieving workplace sustainability
- research and apply sustainability assessment tools and key performance indicators and benchmarks
- describe sustainable management principles and strategies
- critique the various software tools for ICT power consumption and CO2 emissions calculations.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the sustainability field of work and include access to:

- a range of workplace documentation
- personnel associated with a relevant business
- legislation, specifications and guidelines
- a site on which preparation of a business case may be carried out.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTSUS803 Research strategies using SAP solutions for sustainable economic and environmental outcomes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish a business case to justify the implementation of systems, applications and products (SAP) in operational strategies to achieve more sustainable business operations and environmental sustainability. It involves accessing industry information and applying legislative guidelines.

It applies to individuals who may work in a role as a business analyst, project manager, consultant, planner or designer who has responsibility for conducting or managing business operations and who plans and conducts cost–benefit analysis and return on investment for the implementation of sustainable schemes at an enterprise level.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Scope enterprise for establishing business case for integrating SAP into business operations	1.1 Critically analyse current enterprise operations to determine what processes or practices can be realised using SAP to ensure long-term sustainability within organisational guidelines 1.2 Research and critically analyse range of alternative SAP product and services solutions, including risk analysis and relative comparisons to prepare business case for validation with stakeholders 1.3 Produce preliminary results of scoping analysis with recommended priority of SAP solutions that would optimise business sustainability and deliver competitive advantage
2. Plan and conduct business case for using SAP solutions	2.1 Evaluate scoping analysis report to produce operating costs estimate projected over appropriate time period for a proposed plan, based on SAP solution for business critical operation 2.2 Conduct cost–benefit analysis to predict potential return on investment (RoI) on economic and environmental sustainability and business benefits derived by proposed SAP solution 2.3 Produce executive summary of proposal for validation with stakeholders, including risk analysis if SAP solution activity is not implemented
3. Devise management strategies for implementing SAP sustainability solution in business operations	3.1 Produce management plan to implement sustainability strategies using SAP software solution tools to improve profitability and reduce environmental impacts 3.2 Establish regular reviews using SAP reports to improve key performance indicators (KPIs) on sustainability performance 3.3 Produce energy usage analysis for proposed SAP solution using projected carbon dioxide (CO2) emissions with comparable benchmarks 3.4 Provide detailed feasibility report to support long-term economic and environmental benefits

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.2	• Critically analyses plans and other documentation from a variety of sources and consolidates information to determine requirements
Writing	1.2, 1.3, 2.3, 3.1-3.4	• Generates complex written reports, executive summaries, business cases and other documents, demonstrating control over a broad range of writing styles and purposes • Prepares documentation expressing ideas, exploring complex issues and constructed logically, succinctly and accurately
Numeracy	2.1, 2.2, 3.3	• Uses highly-developed numeracy skills to interpret complex information and to perform complex calculations for costing, return on investment and sustainability targets and benchmarks
Navigate the world of work	1.1	• Works autonomously making high level decisions to achieve and improve organisational goals • Develops and implements strategies that ensure organisational policies, procedures and regulatory requirements are being met • Monitors and reviews the organisation's policies, procedures and adherence to legislative requirements to implement and manage change
Interact with others	1.2, 2.3, 3.2	• Uses a variety of relevant communication tools and strategies in building and maintaining effective working relationships • Influences and fosters a collaborative culture, facilitating a sense of commitment and workplace cohesion • Understands diversity and seeks to integrate diversity into the work context, for managing change, making decisions and achieving shared outcomes
Get the work done	1.1-1.3, 2.3, 3.2-3.4	• Plans strategic priorities and outcomes within a flexible, efficient and effective context in a diverse environment exposed to competing demands • Gathers and analyses data and seeks feedback to improve plans and processes • Explores and incubates new and innovative ideas through unconstrained analysis and critical thinking to develop and improve the organisation's goals • Uses digital technologies to manage business operations

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		and actively investigate new technologies for strategic and operational purposes

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTSUS803 Research strategies using SAP solutions for sustainable economic and environmental outcomes	ICASUS703A Research strategies using SAP solutions for sustainable economic and environmental outcomes	Updated to meet Standards for Training Packages. Recoded and minor changes to performance criteria to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTSUS803 Research strategies using SAP solutions for sustainable economic and environmental outcomes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- conduct a scoping exercise and produce an analytical report
- conduct an effective cost–benefit analysis using systems applications and products (SAP) solutions to justify return on investment (RoI) on economic and environmental sustainability
- produce an accurate executive summary for stakeholder validation
- produce a thorough management plan to implement strategies using SAP software solutions
- produce an accurate energy usage analysis and feasibility report for long-term sustainability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise and recommend best practice approaches relevant to SAP sustainability
- appraise the extensive range of SAP software solutions and tools
- research and specify energy consumption and energy audit methodologies
- review waste and recycling policies and management
- contrast strategies for procurement and supply chain management
- outline business operation and procedures
- research and specify environmental and sustainability legislation, regulations and codes of practice applicable to the industry and the organisation
- research and evaluate carbon emission global and national legislation, targets and benchmarks
- critique environmental impacts of products, processes, systems and services
- specify the principles, practices and available tools and techniques of social, economic and environmental sustainability management
- research and summarise various strategies and benefits applicable to conducting a business sustainably, including:
  - quality assurance systems relevant to own organisation
  - relevant organisational policies, procedures and protocols
  - relevant systems and procedures to aid in the achievement of a sustainable workplace.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the sustainability field of work and include access to:

- a range of workplace documentation
- relevant personnel
- organisational plans
- relevant legislation
- equipment specifications
- sites on which preparation of a business case may be carried out.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTSUS804 Use ICT to improve sustainability outcomes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use ICT tools and technologies to improve sustainability outcomes for a range of industries through monitoring and reporting on greenhouse gas emissions.

It applies to individuals with a high level of autonomy who are excellent communicators with telecommunications and systems skills and management abilities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design and manage a sustainability audit	1.1 Use audit tool that reflects criteria of benchmark, nature of risks, relevant information and data types, evaluation of performance and legislative requirements 1.2 Define scope, objectives and benchmarks for audit in consultation with relevant stakeholders 1.3 Document requirements for audit resources, timing, schedule and responsibilities consistent with industry best practice and relevant standards 1.4 Ensure collection strategies are objective and systematic, and that information and data is valid and reliable 1.5 Report outcomes clearly and concisely, including benefits to be achieved by adoption of audit recommendations
2. Monitor energy consumption and emissions	2.1 Analyse requirements of National Greenhouse and Energy Reporting System (NGERS) and other relevant legislation and industry standards in relation to a range of industries and needs of specific organisations 2.2 Identify links with functional areas and environmental management systems to ensure comprehensive information and data collection 2.3 Determine hardware and software required for collecting, collating, analysing and reporting emissions-related information and data 2.4 Factor requirement for an external audit into the monitoring proposal 2.5 Critically evaluate energy consumption and emissions data 2.6 Develop improvement strategies based on review of data 2.7 Use industry best practice as quality benchmark
3. Develop ICT solutions to improve sustainability outcomes	3.1 Research and analyse mitigation and adaptation strategies appropriate for a range of industries 3.2 Benchmark and document performance expectations in consultation with relevant stakeholders 3.3 Develop and document technical specifications including hardware, software, networking, interface and security and hazard management requirements

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ELEMENT	PERFORMANCE CRITERIA
	3.4 Determine timelines, resources and costs for implementation and ongoing monitoring and maintenance 3.5 Analyse impact of ICT solution in relation to performance benchmarks 3.6 Analyse opportunities and develop recommendations to improve sustainability of enterprise products, services and processes 3.7 Present report for client sign-off

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.1, 2.2, 2.5-2.7, 3.3	• Identifies, analyses and evaluates complex textual information to inform sustainability solutions
Writing	1.2, 1.3, 1.5, 2.4, 2.6, 3.2, 3.3, 3.6, 3.7	• Produces detailed reports and related documentation and develops recommendations using precise language and specialised terminology to convey understanding of outcomes
Oral Communication	1.2, 1.5, 3.2, 3.7	• Articulates clearly using specific language suitable to client and stakeholder audiences to convey requirements, and uses listening and questioning techniques to confirm understanding
Numeracy	1.1, 2.5, 3.4	• Uses mathematical formulae to plan budgetary requirements and evaluate timelines for solution implementation and ongoing monitoring requirements • Interprets complex energy consumption and emissions data to identify workplace improvements
Navigate the world of work	1.1, 1.3, 2.1	• Recognises and responds to both explicit and implicit organisational procedures and protocols and legislative/regulatory requirements
Get the work done	1.1-1.4, 2.2, 2.3	• Develops flexible plans for complex, high impact activities with strategic implications involving diverse stakeholders with potentially competing demands • Takes responsibility for defining key aspects of own workload, balancing own needs and priorities with those of the work group • Systematically gathers and analyses all relevant information and evaluates options to make high-impact and informed decisions • Considers strategic and operational potential of digital trends to achieve work goals, enhance work processes, create opportunities and reduce risks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTSUS804 Use ICT to improve sustainability outcomes	ICTSUS7235A Use ICT to improve sustainability outcomes	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTSUS804 Use ICT to improve sustainability outcomes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- audit and critically analyse patterns of energy use
- develop monitoring and reporting systems that comply with regulatory requirements
- develop a workable implementation strategy
- formulate solutions to improve sustainability outcomes
- develop benchmarks for reviewing and improving performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain auditing sustainability processes and practices
- discuss corporate social responsibility
- describe development processes and practices
- clarify hazard identification and control
- explain industry standards
- discuss the legislative framework underpinning sustainability
- summarise principles, practices and available tools and techniques of sustainability management relevant to a range of industries
- outline relevant international business and organisational standards
- discuss sustainability from a local, national and international perspective
- summarise sustainability including ecological, economic and social issues
- discuss technical performance measurements.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the Telecommunications – Sustainability industry and include access to:

- relevant reports, legislation, regulations and standards
- suitable hardware, software, resources and equipment
- internet connection with suitable bandwidth
- relevant documentation including manufacturers' technical specifications.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN801 Plan a transmission network

Modification History

Release	Comments
Version 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse requirements and plan a new or upgraded telecommunication transmission network or convergence to Next Generation Networks (NGN).

It applies to individuals with high-level technical skills working as technical officers, supervisors and engineers working with optical, dense wavelength division multiplexing (DWDM), fibre networks and wireless networks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Scope the project	1.1 Obtain and interpret relevant legislation, codes, regulations and standards including work health and safety (WHS) and environmental requirements for the given work 1.2 Obtain project brief from appropriate person 1.3 Evaluate potential transmission options and select most suitable type of transmission network that meets criteria outlined in project brief 1.4 Analyse limitations of transmission path characteristics and develop solutions for transmission impairments 1.5 Produce a report outlining reasons for selection of a transmission network, together with a shortlist of suitable equipment vendors and products 1.6 Obtain traffic load from network information sources or forecasts, and then dimension the proposed network service 1.7 Produce brief on relationship between transmission network architecture components and overall network, and their impact on the work 1.8 Evaluate equipment type and technologies to determine availability, cost and compatibility with existing network equipment 1.9 Determine resources and equipment needed for work according to enterprise procedures and check for correct operation and safety 1.10 Assess capacity limitation of various platforms in context of the work to optimise maximum network performance 1.11 Determine product capability and calculate allowable capacity of transmission network to allow for network growth
2. Produce link budget	2.1 Critically analyse transmission system using equipment and vendor's specifications to produce a link budget and assess resulting margin 2.2 Document results of link budget analysis
3. Produce deployment plan for transmission network	3.1 Conduct planning work using current equipment components and complying with transmission network deployment rules and exemption process criteria 3.2 Produce preliminary plan on network deployment that

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ELEMENT	PERFORMANCE CRITERIA
	maintains transmission network integrity 3.3 Establish a solution to unexpected situations through discussion with appropriate personnel, with consideration to job specifications, safety and enterprise procedures 3.4 Review plan to ensure it complies with all standards and codes required when working on network access, and make adjustments where appropriate
4. Complete work	4.1 Produce final deployment plan including recommendations agreed with customer 4.2 Provide report on network management and performance monitoring system to be incorporated in the transmission network to ensure network is performing at optimum level

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.9, 3.4	• Organises, evaluates and interprets complex technical and non-technical information including legislative, enterprise and policy documentation
Writing	1.5, 1.7, 2.2, 3.2, 3.4, 4.1, 4.2	• Prepares clear and concise workplace documentation, including reports and recommendations, incorporating technical language to communicate complex information clearly and effectively
Oral Communication	1.2	• Uses highly developed listening, observational and questioning skills to understand project scope and clarify and explore meaning
Numeracy	1.8, 1.11, 2.1	• Interprets numerical information to determine business costs and undertake link budget calculations, interpret results and evaluate different types of technical data
Navigate the world of work	1.1, 1.9, 3.3, 3.4	• Monitors adherence to organisational policies and protocols and legal and regulatory requirements of self and others
Interact with others	1.6, 3.3	• Selects and uses appropriate conventions and protocols when communicating with stakeholders in various work contexts • Collaborates with others to achieve joint outcomes, taking the lead in identifying all issues and facilitating agreement
Get the work done	1.3, 1.4, 1.8, 1.9, 1.10, 1.11, 2.1, 3.1, 3.3	• Uses combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to understand uses and potential of technology • Implements actions according to a predetermined plan, making adjustments if necessary • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTTEN801 Plan a transmission network	ICTTEN7193B Plan a transmission network	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN801 Plan a transmission network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate potential transmission options and select most suitable type of transmission network
- analyse effect of transmission path characteristics on transmission systems
- develop solutions for transmission impairments
- select appropriate testing regimes for transmission technologies
- determine key multiplexing features of transmission technologies
- develop transmission network work plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline impact of relevant legislation, codes, regulations and standards involved with planning networks
- explain alternating current and transmission line theory
- compare emerging telecommunications switching and transmission technologies
- define network capacity and capability management
- outline capacity limitation of various platforms
- explain commercial considerations of Access Network deployment
- outline common switching and transmission support services
- explore compatibility issues for new technologies and equipment
- evaluate currency of technology and equipment under consideration
- explain data transmission
- summarise digital multiplexing techniques and hierarchies
- clarify enterprise deployment rules
- explain exemption process criteria
- outline network topologies
- formulate product capability and availability that are allowable within a transmission network
- establish aspects of telecommunications when planning a network, including:
  - alarm management
  - bearers
  - performance monitoring systems
  - transmission:
  - architectures and geographical categorisation
  - information sources
  - technology and equipment
- determine a cost analysis for a planned network.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site to plan transmission network
- equipment and system manuals and specifications
- legislation and documentation to plan a transmission network.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN802 Manage alignment of systems with product and technology strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop a technology roadmap and interface management system to align and integrate systems with a product and technology strategy.

It applies to individuals with technical and task management skills who measure network performance according to manufacturer's design specifications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop technology roadmap	1.1 Critically analyse market research information and determine customer needs within product and technology strategy from a technology roadmap 1.2 Evaluate enterprise and technology issues which will affect design of the system, and translate them into system requirements 1.3 Evaluate program, product and technology needs that affect definition of the system life-cycle 1.4 Develop systems integration, verification and validation plans from the design requirements 1.5 Develop and communicate key aspects on implementation of the technology roadmap to stakeholders and customers
2. Develop interface management of system elements	2.1 Determine system element interfaces and sources of complexity for interface management of the system 2.2 Develop a process and appropriate techniques to be adopted for interface management of system elements 2.3 Create a control process of system element interfaces of the management system 2.4 Liaise and arbitrate conflicts in the interfaces definition process
3. Implement systems integration	3.1 Evaluate suitability of system integration, verification and validation plans for the product and technology strategy of the technology road map for a consumer product 3.2 Develop systems integration, verification and validation plans for complex systems, including method and timing for each activity 3.3 Manage system integration plan and diagnose complex faults 3.4 Document fault conditions, report to appropriate person and follow up corrective actions 3.5 Prepare evidence for customer acceptance and certification of the system integration management plan for consumer product 3.6 Plan and manage a transition to operational activity of product

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 3.1	• Organises, evaluates and interprets technical documentation, software and hardware manuals, specifications and relevant enterprise policy
Writing	1.4, 3.2, 3.4, 3.5	• Prepares clear and concise workplace documentation, including diagrammatic material incorporating technical language, to communicate complex information clearly and effectively
Oral Communication	1.1, 2.4	• Participates in verbal exchanges using highly developed listening, observational and questioning skills to understand others' perspectives, and clarify, explore and extend meaning
Interact with others	1.5, 2.4, 3.4	• Selects and uses appropriate conventions and protocols when communicating with stakeholders in a range of work contexts • Collaborates with others to achieve joint outcomes, taking the lead in identifying issues and facilitating agreement
Get the work done	1.2-1.5, 2.1-2.3, 3.1-3.4, 3.6	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to plan appropriate systems • Implements actions according to a predetermined plan, making adjustments if necessary • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal analytical and lateral thinking techniques to resolve software, hardware and logistics problems

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTTEN802 Manage alignment of systems with product and technology strategy	ICTTEN7219A Manage alignment of systems with product and technology strategy	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN802 Manage alignment of systems with product and technology strategy

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- plan implementation and testing of new system requirements, including system functionality and performance under load conditions
- manage interface elements of a new system
- implement systems integration
- recognise potential causes of problems and service level impact
- analyse impact of integration of system changes on network
- prepare documentation for customer acceptance and certification of system integration.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise technology issues for a specified enterprise
- explain integration, verification and validation plans
- summarise interface management systems
- outline legislation, codes of practice and other formal agreements directly impacting system integration
- summarise specific work health and safety (WHS) requirements that impact activity in terms of safety of self and the general public
- explain system element interfaces
- summarise system integration solutions techniques
- explain system life cycles
- define technology roadmaps.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where alignment of computer support systems with a product and technology strategy may be conducted
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTTEN803 Translate domain and solution architectures into platform requirements and designs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, deploy, manage and optimise the entire solution life cycle via translation for an existing or new infrastructure of Next Generation Technology (NGN).

It applies to individuals with highly developed technical skills who use design software and simulation to test system performance to a manufacturer's or design specification.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop system design requirements	1.1 Produce system requirements specifications for a complex project involving enterprise and technology issues using the simplest possible technology and making the system modular 1.2 Resolve and negotiate requirement conflicts to establish a complete and consistent requirement set 1.3 Produce and develop acceptance criteria for requirements 1.4 Design a requirements management plan with categorisations, structures and sources of complexity 1.5 Develop a process to manage requirements, enabling users to influence future improvements
2. Produce system design based on requirements	2.1 Evaluate strengths and weaknesses of relevant technologies in context of the design requirement and needs for systems integration 2.2 Create range of alternative interdisciplinary concepts and assess their attributes 2.3 Plan for incorporation of later life-cycle design attributes while developing design requirements 2.4 Devise a system design strategy and approach, using tools and techniques to conduct functional analysis 2.5 Produce a set of parameters to track critical aspects of the design 2.6 Use documentation, modelling and simulation tools and techniques to represent a system or system element 2.7 Use complex simulations to evaluate design concepts for a system or system element 2.8 Produce a report to evaluate and advise on risks, suitability and limitations of models and simulations 2.9 Identify underlying domain-specific issues, strategy and approach to be adopted for ensuring system robustness 2.10 Produce a robust design using domain-specific strategy and approach for platform requirements and designs
3. Verify solution design and traceability	3.1 Align specific aspects of the design to original intent 3.2 Verify and track specific aspects of current design against

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ELEMENT	PERFORMANCE CRITERIA
	original intent throughout the supply chain 3.3 Compare verification requirements with system requirements 3.4 Use change control and configuration management to implement remedial actions and change control for inconsistencies

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.6	• Organises, evaluates and critiques ideas and information from a wide range of complex texts
Writing	1.1, 1.3-1.5, 2.5, 2.8, 2.10	• Demonstrates sophisticated writing skills by selecting appropriate conventions and stylistic devices to express precise meaning
Oral Communication	1.2	• Participates in verbal exchanges using appropriate tone and clear language to address key personnel • Uses listening and questioning skills to confirm understanding
Interact with others	1.2	• Collaborates and negotiates to achieve agreeable outcomes in potentially contentious situations
Get the work done	1.1, 1.5, 2.1-2.4, 2.6, 2.7, 2.9, 2.10, 3.1-3.4	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses this to analyse and design solutions • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Uses formal analytical and lateral thinking techniques for diagnosing problems and generating and evaluating possible solutions

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTTEN803 Translate domain and solution architectures into platform requirements and designs	ICTTEN7220 A Translate domain and solution architectures into platform requirements and designs	Updated to meet Standards for Training Packages. Recoded to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN803 Translate domain and solution architectures into platform requirements and designs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop system design requirements
- evaluate design concepts for system or system element using complex simulations
- produce a system design using domain specific strategy to platform requirements and design
- use functional analysis tools
- verify solution design and traceability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain complex simulation techniques
- summarise current enterprise platforms and designs
- outline design of management plans
- explain domain and solution architectures
- determine and summarise technological issues for a specified enterprise
- outline information required to simulate computer system elements according to a test specification
- explain interdisciplinary concepts and attributes
- explain life cycle design attributes
- contrast remedial actions and select control for inconsistencies
- explain solution design and traceability
- provide a detailed summary of tools required to conduct functional analysis.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where development, deployment, management and optimisation of domain and solution architectures into platform requirements and designs can be undertaken
- documentation, modelling and simulation tools currently used in industry
- tests and equipment currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN804 Manage end to end architectural solutions across multiple domains

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse business options and design for network infrastructure service providers and implement end-to-end architectural solutions.

It applies to individuals with excellent technical, communication and planning skills working in project management roles with authority to direct installation activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Evaluate tools and techniques for architectural design	1.1 Apply principles of architectural design within the life cycle of application software 1.2 Develop a process to apply appropriate tools and techniques for architectural design of end-to-end solutions 1.3 Evaluate and select appropriate analysis and selection techniques to develop a partition between discipline technologies and derive discipline-specific requirements
2. Analyse design options for optimal solutions	2.1 Critically analyse business options to support architectural design trade-offs for an optimal design solution 2.2 Develop alternative architectural designs traceable to the requirements 2.3 Evaluate a range of architectural solutions and justify selection of the optimum solution
3. Develop interface requirements for effective solutions across multiple domains	3.1 Evaluate system element interfaces and sources of complexity for interface management of the system across multiple domains 3.2 Develop a process and appropriate techniques to be adopted for the interface management of system elements for end-to-end architectural solutions 3.3 Produce a control process for system element interfaces of the management system 3.4 Liaise and arbitrate between stakeholders where there are conflicts in the definition of interfaces
4. Manage end-to-end systems integration	4.1 Evaluate suitability of system integration, verification and validation plans for end-to-end architectural solutions across multiple domains 4.2 Develop systems integration, verification and validation plans for complex systems to ensure a viable integration process 4.3 Manage system integration plan and diagnose complex faults 4.4 Document fault conditions, report to appropriate person and follow up corrective actions 4.5 Prepare evidence for customer acceptance and certification of the system integration management plan 4.6 Plan and manage a transition to operational activity for the

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ELEMENT	PERFORMANCE CRITERIA
	end-to-end solution
5. Incorporate components of an architecture from a third party	5.1 Negotiate with vendor for acceptable vendor agreements and agreed roles and responsibilities of each party 5.2 Manage vendor within a clearly defined process for dealing with defects and scope changes 5.3 Plan beyond delivery of specific elements and establish requirements for ongoing maintenance and support from vendor
6. Manage requirements for the architecture solution	6.1 Negotiate minimum component costs with vendors and analyse vendor component costs as part of assessment for the appropriateness of vendor's quote 6.2 Manage vendor selection process to provide high-quality solutions within appropriate costings

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1	• Organises, evaluates and interprets a range of complex documentation to evaluate product and technology needs
Writing	2.2, 2.3, 3.3, 4.2, 4.4, 4.5	• Prepares clear and concise workplace documentation including reports and designs incorporating technical language to communicate complex information clearly and effectively
Oral Communication	3.4, 4.4, 5.1, 5.2, 6.1	• Participates in verbal exchanges with key personnel, customers and contractors using appropriate tone and clear language • Uses listening and questioning skills to confirm understanding
Interact with others	3.4, 4.4, 5.1, 5.2, 6.1	• Selects and uses appropriate conventions and protocols when communicating with customers, vendors or technical personnel in a range of work contexts • Collaborates and negotiates to achieve agreeable outcomes in potentially contentious situations
Numeracy	6.1	• Interprets numerical information to determine best value-for-money solutions according to business requirements
Get the work done	1.1-1.3, 2.1, 2.3, 3.1, 3.2, 4.1, 4.3, 4.4, 4.6, 5.3, 6.2	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses these to plan complex systems • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Uses formal analytical and lateral thinking techniques for diagnosing problems and generating and evaluating possible solutions

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTTEN804 Manage end to end architectural solutions across multiple domains	ICTTEN7221A Manage end to end architectural solutions across multiple domains	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN804 Manage end to end architectural solutions across multiple domains

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate tools and techniques for architectural design
- analyse design options for optimal solutions
- develop interface requirements for effective solutions across multiple domains
- manage end-to-end systems integration
- incorporate components of a third party architecture
- manage requirements for the architecture solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed summary of architectural design tools
- explain interface management
- outline management of end-to-end system integration
- summarise new end-to-end architecture design solutions
- explain solutions for business options across multiple domains
- outline system integration solution techniques
- summarise system interfaces
- explain validation plans
- explain importance of vendors' agreements with specific reference to roles and responsibilities of each party
- identify and quantify components' costs.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where architecture solutions across multiple domains can be managed
- simulation software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTTEN805 Manage solution architecture and impacts in line with organisational processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse business options to plan, develop and manage solution architecture systems integration across multiple architectures for a telecommunications service provider.

It applies to individuals with excellent technical, communication and planning skills working in project management roles with authority to direct installation activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop plan to support architectural design process	1.1 Prepare a plan with techniques to support the architectural design process and communicate the solution to different stakeholder groups 1.2 Critically analyse business options to support architectural design trade-offs for optimal design solution 1.3 Evaluate strengths and weaknesses of relevant technologies in context of the requirement 1.4 Assess a range of interdisciplinary concept ideas and effect their attributes would have on the design requirements 1.5 Prepare a solutions architecture plan detailing all possible solutions
2. Develop interface requirements for effective solutions across multiple architectures	2.1 Evaluate system element interfaces and sources of complexity for interface management of the system across multiple architectures 2.2 Develop a process and appropriate techniques to be adopted for interface management of system elements for solution architecture 2.3 Produce a control process of system element interfaces of the management system 2.4 Liaise and arbitrate between stakeholders where there are conflicts in definition of interfaces
3. Manage solution architecture systems integration	3.1 Evaluate suitability of system integration, verification and validation plans for solution architecture from requirements 3.2 Develop systems integration, verification and validation plans for complex systems to ensure viable integration process 3.3 Manage system integration plan and diagnose complex faults 3.4 Document fault conditions, report to appropriate person and follow up corrective actions 3.5 Prepare evidence for customer acceptance and certification of system integration management plan 3.6 Plan and manage a transition to operational activity for the solution architecture
4. Manage solution implementation and	4.1 Produce final project management requirements against solution architecture plan and notify stakeholder groups of

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ELEMENT	PERFORMANCE CRITERIA
notify stakeholder groups	impending implementation 4.2 Evaluate impact of proposed project solutions on customers and enterprise 4.3 Manage solution architecture activities as part of overall project plan and monitor solution architecture risks 4.4 Manage amendments to solution architecture processes to meet needs of the project and apply necessary corrective actions

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	3.1	• Organises, evaluates and interprets a range of complex documentation such as software and hardware manuals
Writing	1.1, 1.5, 3.2, 3.4, 3.5, 4.1	• Prepares clear and concise workplace documentation, including recommendations, incorporating technical language to communicate complex information clearly and effectively
Oral Communication	2.4	• Participates in verbal exchanges using tone and language appropriate to audience and environment
Interact with others	2.4, 3.4, 4.1	• Selects and uses appropriate conventions and protocols when communicating with stakeholders in a range of work contexts • Collaborates and negotiates to achieve agreeable outcomes in potentially contentious situations
Get the work done	1.2-1.4, 2.1-2.3, 3.1, 3.3, 3.4, 3.6, 4.2-4.4	• Operates from a broad conceptual plan, developing operational detail in stages, regularly reviewing priorities and performance during implementation, identifying and addressing issues • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses this to prepare proposals • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal analytical and lateral thinking techniques to resolve domain, technology and logistics problems • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles and their impact on customers and enterprise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN805 Manage solution architecture and impacts in line with organisational processes	ICTTEN7222 A Manage solution architecture and impacts in line with organisational processes	Updated to meet Standards for Training Packages. Recoded and minor changes to PCs to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN805 Manage solution architecture and impacts in line with organisational processes

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare an architecture plan exploring a range of alternative solutions
- develop interface requirements for effective solutions across multiple architectures
- manage solution architecture systems integration
- analyse impact of proposed project solutions on customers and enterprise
- prepare evidence for customer acceptance and certification of system integration management plan
- produce final project management requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and define features and operating requirements of complex systems, key performance indicators (KPIs) and service level agreements
- outline information required to define solution architecture and impacts in line with organisational processes
- summarise interdisciplinary concepts across multiple architectures
- outline issues and challenges occurring with system changes
- explain legislation, codes of practice and other formal agreements directly impacting system integration
- summarise manufacturer's requirements for operation of systems equipment
- identify and critique relevant organisational policies and procedures
- outline performance and integration requirements
- summarise solutions architecture alternatives
- summarise specific work health and safety (WHS) requirements that impact activity in terms of safety of self and the public
- outline system element interfaces for solution architecture
- explain system integration plans
- explain validation plans.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where development and management of solution architecture systems integration across multiple architectures may be conducted
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN806 Manage application layer solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop, evaluate, manage, deploy and maintain application layer solutions for new solutions or existing network telecommunications service.

It applies to individuals with highly developed technical skills working as network engineering staff or senior technical officers with appropriate project management roles and authority to direct activities of installation staff, manufacturers and vendors.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications networks engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop application layer solutions	1.1 Produce requirements for applications layer solutions for delivery of new applications layer solutions to customers using forecasting demand data 1.2 Prepare a plan for an organisational change control process and integration of new solutions within a complete network infrastructure 1.3 Produce a test management schedule for the testing process of application product 1.4 Translate complex design and architecture requirements to traceable application characteristics according to design requirements 1.5 Develop application architecture solution specifications using an industry process according to design requirements 1.6 Develop application software resource profiling and select suitable vendor for negotiations 1.7 Translate complex requirements into software packaging 1.8 Produce software deployment mapping and version control to ensure complete integration and compatibility of application solution with existing system 1.9 Complete configuration management and provide complex input network design requirements
2. Critically analyse test results of application layer solutions	2.1 Use design document and integration document software to replicate issues exhibited in test environment 2.2 Certify software solution compatibility and compliance to requirements using a web-based test management tool (quality centre) to conduct performance evaluation tests 2.3 Critically analyse test reports to evaluate load balancing and network security issues in test environment 2.4 Resolve complex issues in interface to isolate defects
3. Manage deployment of application layer solutions	3.1 Plan and prepare evidence for customer acceptance and certification 3.2 Plan and manage transition to operation activities required for transition to operation of integrated application layer solution 3.3 Prepare installation failures procedure to make changes while

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ELEMENT	PERFORMANCE CRITERIA
	maintaining service levels 3.4 Manage change implementation plan to maintain system stability
4. Maintain currency of application layer solutions	4.1 Manage ongoing monitoring activities to prolong new applications layer solution life cycle for cost-effective business reasons 4.2 Produce tuning activities to make efficient use of resources 4.3 Analyse current demands for resources to derive forecasts and future requirements 4.4 Produce a capacity plan predicting infrastructure resource needs to achieve agreed service levels

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 1.5, 2.3	• Organises, evaluates and interprets a range of complex technical documentation including software and hardware manuals
Writing	1.2, 1.3, 1.8, 3.3, 4.4	• Prepares clear and concise workplace documentation including complex plans incorporating technical language to communicate complex information clearly and effectively
Numeracy	1.1, 2.3, 4.1	• Analyses and synthesises highly embedded mathematical information in a broad range of tasks and texts
Get the work done	1.4-1.6, 1.8, 1.9, 2.1-2.4, 3.1, 3.2, 3.4, 4.1-4.4	• Operates from a broad conceptual plan, developing operational detail in stages, regularly reviewing priorities and performance during implementation, and identifying and addressing issues • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses this to devise solutions • Uses a broad range of strategies to store, access and organise virtual information, recognising design choices will influence what information is retrieved and how it may be interpreted and used • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal analytical and lateral thinking techniques to resolve logistics problems • Monitors outcomes of decisions, considering results from a range of perspectives and identifying key concepts and principles and their impact on customers and enterprise

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN806 Manage application layer solutions	ICTTEN7223A Manage application layer solutions	Updated to meet Standards for Training Packages. Recoded and minor changes to elements and PCs to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN806 Manage application layer solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a test management schedule for testing process of application product
- develop application architecture solution specifications using an industry process
- produce software deployment mapping and version control
- analyse test results of application layer solutions
- prepare evidence for customer acceptance and certification
- prepare an installation failures procedure
- manage ongoing monitoring activities
- produce tuning activities
- produce a capacity plan predicting infrastructure resource needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain installation failure procedures
- summarise legislation, codes of practice and other formal agreements that directly impact activity
- explain important tenets of managing change
- explain new applications layer solutions
- define software and hardware resources required by an application layer
- outline specific workplace health and safety (WHS) requirements that impact activity in terms of safety of self and the public
- outline system integration techniques
- explain test management scheduling
- summarise tuning activities to maintain currency
- explain use of forecasting demand data
- explain use and purpose of test management tools.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where management of application layer solutions may be conducted
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN807 Manage voice, data and internet protocol network solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to integrate new solutions to an existing network and manage change implementation.

It applies to individuals with excellent technical skills working as network engineering or senior technical staff within project management roles with authority to direct activities of installation staff, manufacturers and vendors.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop voice, data and IP network solutions	1.1 Produce requirements for voice, data and IP network solutions for delivery of new voice, data and IP networks to customers using forecasting demand data 1.2 Prepare plan for organisational change control process and integration of new solutions within a complete network infrastructure 1.3 Produce test management schedule for testing process of network product solution 1.4 Translate complex design and architecture requirements to traceable software application characteristics according to design requirements 1.5 Develop network architecture solution specifications using industry process according to design requirements 1.6 Develop software and hardware resource profiling and select suitable vendor for negotiations 1.7 Translate complex requirements into software packaging 1.8 Produce software deployment mapping and version control to ensure complete integration and compatibility of network application solution to existing system 1.9 Complete configuration management and provide complex input network design requirements
2. Critically analyse test results of voice, data and IP network solutions	2.1 Use design document and integration document software to replicate issues exhibited in test environment 2.2 Certify software solution compatibility and compliance to requirements using web-based test management tool (quality centre) to conduct performance evaluation tests 2.3 Critically analyse test reports to evaluate load balancing and network security issues in test environment 2.4 Resolve complex issues in interface to isolate defects
3. Manage deployment of voice, data and IP network solutions	3.1 Plan and prepare evidence for customer acceptance and certification 3.2 Plan and manage transition to operation activities required for transition to operation of integrated IP network solution 3.3 Prepare installation failures procedure to make changes while

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ELEMENT	PERFORMANCE CRITERIA
	maintaining service levels 3.4 Manage change implementation plan to maintain system stability
4. Maintain currency of voice, data and IP network solutions	4.1 Manage ongoing monitoring activities to prolong new IP network solution life cycle for cost-effective business reasons 4.2 Produce tuning activities to make efficient use of resources 4.3 Analyse current demand for resources to derive forecasts and future requirements 4.4 Produce a capacity plan predicting infrastructure resource needs to achieve agreed service levels

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.4, 1.5, 2.3	• Organises, evaluates and interprets complex technical documentation, such as software and hardware manuals and design specifications
Writing	1.3, 1.5, 1.9, 3.1, 3.3, 4.4	• Prepares clear and concise workplace documentation including reports and recommendations incorporating technical language to communicate complex information clearly and effectively
Numeracy	1.1, 2.3, 4.1, 4.3	• Uses numerical information to interpret results, evaluate different types of technical data, take measurements and determine cost-effective outcomes
Get the work done	1.1-1.8, 2.1, 2.2, 2.4, 3.1, 3.2, 3.4, 4.1, 4.4	• Uses combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses this to devise solutions • Implements actions according to a predetermined plan, making adjustments if necessary • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • Uses formal analytical and lateral thinking techniques for identifying issues, and developing and evaluating procedures for network solutions

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTTEN807 Manage voice, data and internet protocol network solutions	ICTTEN7224A Manage voice, data and internet protocol network solutions	Updated to meet Standards for Training Packages. Recoded and minor changes to PCs to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN807 Manage voice, data and internet protocol network solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce a test management schedule
- develop network architecture solution specifications
- develop software and hardware resource profiling and select suitable vendor for negotiations
- undertake configuration management of voice, data and internet protocol (IP) network, and provide complex input network design requirements
- analyse test reports to evaluate load balancing and network security issues
- plan and prepare evidence for customer acceptance
- prepare installation failures procedure
- produce tuning activities to enable efficiencies
- produce capacity plan predicting infrastructure resource needs.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise installation failure procedures
- investigate change management strategies relevant to introduction of new technologies
- explain new IP network solutions
- identify and contrast software and hardware resources relevant to project
- explain system integration techniques
- explain test management scheduling
- provide detailed summary of tuning activities necessary to maintain currency
- explain use of forecasting demand data
- identify and contrast various test management tools.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where management of voice, data and IP network solutions can be undertaken
- software and hardware resources suitable for developing, deploying and managing voice, data and IP network solutions
- tests and equipment currently used in industry.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN808 Manage network testing strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to plan and manage a test regime for evaluation of application software for a telecommunications network.

It applies to individuals with high-level technical skills working as network engineers or senior technical staff within project management roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan test effort and develop test strategy for an application software	1.1 Critically analyse functionalities of an application software from the system design document and create test strategy for new telecommunications product line 1.2 Produce steps for test strategy, including attributes of each step according to enterprise policy 1.3 Produce test strategy for evaluating suitability of application software for integration into telecommunications network 1.4 Critically analyse test strategy and identify types of risks that would hinder test performance or reality
2. Plan test strategy for regime	2.1 Produce phases of a test cycle for a test regime according to system design document 2.2 Assess a range of tests required to evaluate performance and functionality of application software and determine tests required to suit the test regime 2.3 Evaluate features of testing tool and debuggers and select an appropriate tool to test software application and detect faults 2.4 Evaluate elements of test plan that cover testing functionality of the application software
3. Design test plan and produce test reviews	3.1 Determine forecast time, effort and cost for low and medium intensity projects to perform testing 3.2 Develop a test case or test scenario with prerequisite states based on requirements to generate expected test results for test plan 3.3 Produce test plan for specific phases based on requirements of project specifications for the application software 3.4 Produce test reporting associated with particular test phases within test plan 3.5 Critically analyse test reports and evaluate impact of test plan on the testing environment 3.6 Manage progress of test plan to minimise risks associated with testing and ensure test compliance with test requirements 3.7 Report any detected defects to product evaluation personnel, and prepare a strategy to manage defects

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ELEMENT	PERFORMANCE CRITERIA
4. Manage test traceability	4.1 Create a traceability matrix to correlate relationship between marketing requirements and detailed requirements of software product to matching parts of design, test plan and test cases 4.2 Critically analyse testing metrics produced by test tool to manage tracking of defects and plan process improvements based on the metrics 4.3 Produce an evaluation report from traceability matrix to manage defects or failures from the test plan

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.5	• Organises, evaluates and critiques ideas and information from a wide range of complex texts
Writing	1.1, 1.2, 1.3, 3.3, 3.7, 4.3	• Prepares clear and concise workplace documentation including reports and recommendations incorporating technical language to communicate complex information clearly and effectively
Numeracy	3.1, 3.5, 4.2	• Uses numerical information to interpret and evaluate different types of technical data, take measurements and determine cost-effective outcomes
Navigate the world of work	1.2	• Adheres to organisational procedures and protocols
Interact with others	3.7	• Selects and uses appropriate conventions and protocols when communicating with technical personnel in a range of work contexts
Get the work done	1.1-1.4, 2.1-2.4, 3.1-3.4, 3.6, 4.1, 4.2	• Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high impact activities with strategic implications • Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and uses this to devise strategies • Implements actions according to a predetermined plan, making adjustments as necessary • Takes responsibility for high-impact decisions in complex situations involving many variables and constraints • May use formal analytical and lateral thinking techniques resolving software, hardware and logistics problems

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN808 Manage network testing strategies	ICTTEN7225A Manage network testing strategies	Updated to meet Standards for Training Packages. Recoded and minor changes to PCs to meet AQF requirements.	Equivalent unit

Links

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Assessment Requirements for ICTTEN808 Manage network testing strategies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce steps in developing test strategy
- produce test strategy for evaluating suitability of application software
- design test plan and produce test reviews
- develop a test case or test scenario
- produce a test plan for specific phases
- produce test reporting associated with particular test phases within test plan
- create traceability matrix
- produce an evaluation report from the traceability matrix to manage defects or failures from the test plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain applications software features and functionalities
- summarise configuration of software testing tools
- outline creation of a traceability matrix
- provide detailed summary of different elements of test plans and risks associated with implementation
- outline features of testing tools and debuggers
- explain identification of types of risks
- consider legislation, codes of practice and other formal agreements that directly impact testing
- explain how to manage software defects
- summarise management of test traceability
- outline phases of test cycles
- outline production of test reviews
- consider specific workplace health and safety (WHS) requirements that impact activity in terms of safety of self and the public
- explain relevant steps in developing test strategy
- outline testing procedures and testing cycles for various system applications.
-

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- a site where planning and management of a test regime for evaluation of application software may be conducted
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Assessors must satisfy NVR/AQTF assessor requirements.

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ICTTEN809 Analyse business specifications to produce technical solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply technical solutions in network designs for telecommunications and ICT networking provisioning companies specialising in integrating converging and emerging technologies of ICT networks.

It applies to individuals working as telecommunication officers in service and provision work who carry out design and implementation of technical solutions of information communication technology (ICT) networks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications Networks Engineering

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to critically analyse business specifications	1.1 Research application of a suitable business model for telecommunication service provisioning that meets agreed customer requirements 1.2 Obtain business requirements and business specifications to provide data for the model 1.3 Determine business drivers and requirements of key stakeholders and customers, both internal and external 1.4 Evaluate business objectives and customer requirements for input into the model
2. Produce technical solutions to meet business imperatives	2.1 Research tools and templates for analysing business models and provide reports on technical design and specifications 2.2 Develop technical solutions for customer in response to drivers and business requirements 2.3 Evaluate costs involved in implementing ICT technical solutions for customer 2.4 Produce cost benefit analysis to assess viability and optimum timing for deploying the technical solution for maximum return on investment (ROI) 2.5 Investigate a range of vendor products to determine most suitable to meet technical requirements and customer needs 2.6 Produce a report documenting technical solutions addressing business specifications and recommendations against customer requirements
3. Evaluate impact of technical requirements on the business	3.1 Review and assess business constraints, opportunities and objectives 3.2 Determine technical requirements according to input-output, interface, process flow or quality requirements 3.3 Critically analyse hardware, software and network requirements to suit the business plan 3.4 Build business platform based on IT/ICT technical solutions 3.5 Investigate processes in need of being changed by a business solution 3.6 Document impact of technical requirements on the business

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ELEMENT	PERFORMANCE CRITERIA
4. Document and validate agreed solutions	4.1 Submit technical requirements and solution overview to management for feedback 4.2 Analyse feedback and incorporate change as required 4.3 Document changes and distribute final business solution to internal and external stakeholders

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1, 3.1-3.3, 4.2	• Organises, evaluates and critiques information from a wide range of complex texts
Writing	1.3, 2.4, 2.6, 3.6, 4.2, 4.3	• Generates complex written texts, demonstrating control over a broad range of writing styles and purposes
Oral Communication	1.3, 4.2	• Establishes and maintains complex and effective spoken communication in a broad range of contexts • Displays depth of understanding of complex oral texts which include multiple and unstated meanings
Numeracy	2.3, 2.4	• Uses mathematical formulas and calculations to estimate and plan project costs and evaluate cost-benefits of completed project
Interact with others	4.1, 4.3	• Selects and uses appropriate conventions and protocols when communicating with stakeholders in a range of work contexts
Get the work done	1.2, 2.1, 2.2, 2.5, 3.2-3.4	• Monitors workload in terms of personal and stakeholder goals and outcomes, adjusting or renegotiating priorities and plans as required • Develops plans for complex, high-impact activities with strategic implications that involve a diverse range of stakeholders • Implements actions according to a predetermined plan, making adjustments if necessary and addressing unexpected issues • Considers strategic and operational potential of digital trends to achieve work goals, and enhance work processes and solutions • Uses formal analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions • Uses formal decision-making processes as scaffolding for thinking, seeking input, advice and feedback from others as required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN809 Analyse business specifications to produce technical solutions	ICTTEN7227B Analyse business specifications to produce technical solutions	Updated to meet Standards for Training Packages. Recoded and minor changes to element and PC's to meet AQF requirements.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTTEN809 Analyse business specifications to produce technical solutions

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and critically analyse client specifications against accepted industry practices
- produce technical solutions from business specifications
- analyse feedback from client and make adjustments to proposal
- apply design concepts to business solutions
- produce technical reports regarding design of the solution
- make recommendations and offer optimum design solutions
- produce an evaluation document on impact of technical requirements on the business.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline business models and tools
- summarise business processes
- explain client business domain, business function and organisation
- explain compatibility issues and resolution procedures
- explain configuration of internet protocol (IP) networks
- establish customer and business liaison protocols
- summarise desktop applications and operating systems
- provide a detailed explanation of documenting technical specifications
- explain linkage between processes
- summarise security protocols, standards and data encryption
- outline technologies:
  - access networks
  - core networks
  - information and communications technology (ICT) network topologies
  - mobile cellular networks
  - network protocols and operating systems
  - optical networks and principles
  - radio frequency (RF) networks and principles.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Telecommunications Networks Engineering field of work and include access to:

- client functional requirements
- business specifications
- database software
- simulation software
- organisational guidelines
- network and computer layout
- site design software and hardware
- information on a range of ICT business solutions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB201 Use social media tools for collaboration and engagement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish a social networking presence, using social media tools and applications. It includes the requirement to review, compare, and use different types of social networking tools and applications.

It applies to information and communications technology (ICT) personnel who need to develop a social networking web presence for a small or large office environment, using social media tools and applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Describe the different types of social media tools and applications	1.1 Explain the characteristics of the term 'social media' 1.2 Identify different types of social-media tools and applications 1.3 Illustrate some of the issues associated with the use of social media tools and applications
2. Compare different types of social media tools and applications	2.1 Select one social media type to review 2.2 Review the most popular tools, and applications, within that social media type 2.3 Itemise the benefits across a range of the most popular tools and applications 2.4 Select the most appropriate social media tool or application
3. Set up and use, popular social media tools and applications	3.1 Identify the social media tools and applications available for possible implementation 3.2 Initiate the preferred social media tools, and applications, for use 3.3 Establish the social media interface, using text and file content 3.4 Initiate social networking interaction 3.5 Test and evaluate tools, and applications, for ease of use 3.6 Present the findings

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.2	• Extract the relevant information from technical and organisational documents
Writing	1.1, 2.2, 2.3, 3.3, 3.4, 3.6	• Develop the content in a manner that supports and conveys information, using the appropriate structures and specialised language
Navigate the world of work	1.3	• Understands legal and ethical responsibilities, regarding the use of social media tools
Get the work done	2.1, 2.2, 2.4, 3.1, 3.2, 3.5, 3.6	• Makes routine decisions and implements standard procedures for routine tasks • Understands the purposes, specific functions, and the key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB201 Use social media tools for collaboration and engagement	ICAWEB201A Use social media tools for collaboration and engagement	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB201 Use social media tools for collaboration and engagement

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify different types of social media tools and applications, and the issues associated with their use
- access the internet, set up a social networking presence and upload and link a wide variety of files
- use and evaluate social media tools and applications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list basic technical terminology in relation to social networking, social media applications, and tools
- outline basic methods of uploading images, text files, portable document format (PDF) files, audio files, video files, and link the associated files
- state the features, and functions, of social media applications
- list import and export software functions
- explain how to link documents
- explain the process of tagging, in order to facilitate collaborative folksonomy
- list social media applications and procedures, for connecting to social networking sites
- identify and describe, input and output devices
- describe, and use, really simple syndication (RSS) feeds to connect a social network.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a personal computer (PC) and printer
- the internet
- social-media tools and applications
- online instructional documents.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB301 Create a simple markup language document

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, create and save a basic markup language document, using a text editor.

It applies to individuals who work in an assistant capacity to create web pages.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review the requirements	1.1 Review the requirements of the document 1.2 Select the appropriate markup language, based on organisational standards 1.3 Review the document structure
2. Create the document structure	2.1 Create and assign, the basic elements of the document 2.2 Mark-up sections of the document to depict the structure
3. Validate the documents	3.1 Validate the markup of the language document, against the requirements 3.2 Validate the markup of the language document, in different browsers

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3	• Extracts the relevant information from technical and organisational documents
Writing	2.1, 2.2, 3.1, 3.2	• Develops content in a manner that supports and conveys information, using the appropriate structures and specialised language
Navigate the world of work	1.2	• Understands own role and responsibilities, and follows organisational standards
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2	• Makes basic decisions and implements standard procedures for routine tasks • Understands the purposes, specific functions, and the key features of common digital systems and tools, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB301 Create a simple markup language document	ICAWEB301A Create a simple markup language document	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB301 Create a simple markup language document

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review document requirements, and select the appropriate language
- create and save a markup language document
- validate the document
- use a markup language, without the automated generation of code.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe, markup languages and their associated standards
- list the features and limitations of a range of available browsers
- explain web accessibility.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the organisational style guide or policy
- the document specification
- a text editor
- a range of browsers
- the internet, to validate the markup.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB302 Build simple websites using commercial programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use web authoring tools to create, modify and test, simple web pages and websites.

It applies to individuals with responsibility for creating and maintaining simple websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the authoring requirements	1.1 Select the preferred web authoring tool, according to the client requirements 1.2 Set preferences for the web authoring tool, including the site file transfer protocol client
2. Create and save the files	2.1 Create files, and save them, in the correct location or directory 2.2 Navigate the web authoring tool environment, or workspace 2.3 Access and use, a range of features in the web authoring tool 2.4 Maintain a suitable directory structure for the site 2.5 Save in the appropriate directory structure 2.6 Upload files to the appropriate folder on the server
3. Add content to the web pages	3.1 Insert and format text content, according to the client requirements 3.2 Insert images, data tables, and simple forms 3.3 Access the markup language and make basic modifications to the code
4. Create simple navigation	4.1 Create a site map in order to plan navigation 4.2 Create links between pages to reflect content structure, using both text and images
5. Test the website	5.1 Test the elements of the website's content across a number of different browsers, and browser versions, to ensure the consistency of presentation and performance 5.2 Test that the website meets the client requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.1	• Evaluates a range of technical specifications and other information, to determine the most appropriate solutions to meet client needs and requirements
Writing	2.1, 3.1, 3.3, 4.1	• Uses software, and the appropriate technical language, to create files
Navigate the world of work	3.1	• Understands own role and responsibility to comply with specific client requirements
Interact with others	1.1, 3.1, 5.2	• Initiates a connection with others through verbal, or nonverbal communication, responding as appropriate
Get the work done	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 4.1, 4.2, 5.1, 5.2	• Takes responsibility for planning, sequencing and prioritising tasks within own workload, for efficiency and effective outcomes • Makes some critical and non-critical decisions within mostly familiar situations, to develop and test, functional websites that meet client needs • Understands the purposes, specific functions, and the key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB302 Build simple websites using commercial programs	ICAWEB302A Build simple websites using commercial programs	Updated to meet Standards for Training Packages	Equivalent unit

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Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB302 Build simple websites using commercial programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select, and use, a web authoring tool to create web pages in accordance with client requirements
- insert the text and image elements into a web page
- modify the existing markup
- test web page content for consistency
- upload the files to the server.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the Australian Computer Society Code of Ethics
- list the workp health and safety (WHS) requirements relevant to the information and communications technology (ICT) industry
- identify the web authoring tools used for web page design
- provide an overview of website publishing and markup languages
- explain sustainability concepts, including energy and resource conservation
- describe the function of a file transfer protocol (FTP)
- list common browsers used for accessing the web.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- computer hardware and software
- web authoring tools
- the web servers
- the website
- storage media
- FTP client software
- the server security password, and access procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB303 Produce digital images for the web

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the performance outcomes, skills and knowledge required to produce, and manipulate, images suitable for use in website development.

This unit applies to individuals with responsibility for creating graphics for a web environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the client requirements	1.1 Access and interpret the client brief to determine client needs 1.2 Analyse client needs with regard to image content, quality and size
2. Source the images	2.1 Research the appropriate sources of images, to meet a range of needs 2.2 Source the images appropriate to meet the needs, taking into consideration copyright restrictions
3. Manipulate the images	3.1 Select the appropriate industry-standard, image-editing software for the purpose 3.2 Create backups of the assets to be used 3.3 Use features of the image-editing software, to create a range of effects appropriate to client needs and web application 3.4 Edit, resize, and slice images for use in web applications, as required to meet client needs
4. Save the images	4.1 Save the images, maintaining their individual effects 4.2 Save the images in formats appropriate for use in web applications, and to client needs 4.3 Save the images in the appropriate directory structure

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 3.1	• Investigates and evaluates technical information, software and organisation documents, to determine work requirements, appropriate web applications and solutions
Writing	3.2-3.4, 4.1-4.3	• Uses specific software and technical language to create, format, review, save, and access web-based images
Navigate the world of work	1.1, 2.1	• Understands own role and responsibility, in order to comply with specific client and legislative requirements
Get the work done	1.1, 1.2, 2.1, 2.2, 3.1-3.4, 4.1-4.3	• Takes responsibility for planning, sequencing, and prioritising tasks within own workload, for efficiency and effective outcomes • Makes some critical and non-critical decisions within mostly familiar situations, to develop and test functional websites that meet client needs • Understands the purposes, specific functions, and the key features of common digital systems and tools, and operates them effectively to complete routine tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB303 Produce digital images for the web	ICAWEB303A Produce digital images for the web	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB303 Produce digital images for the web

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse the client's needs
- undertake research to source the images
- manipulate and produce images for use in website development, to meet the requirements of the brief
- save the images in appropriate format.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe, the industry standards and the copyright legislation relevant to digital images
- explain sustainability concepts appropriate to the ICT industry
- describe digital image formats and their application
- identify and summarise, common digital image editing software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- image manipulation software, hardware and storage devices currently used in industry
- the client brief
- the sources of the images, and opportunities to review digital images prepared for a website
- the organisational policy and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB401 Design a website to meet technical requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design a website to specifications, within a particular technical and human interface environment.

This unit applies to individuals who are responsible for analysis, documentation and design, including identifying the technical and human computer interface requirements that drive design.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define the technical environment	1.1 Identify the business requirements 1.2 Identify the appropriate standards required to develop the site 1.3 Identify the appropriate hardware and software required
2. Define the human computer interface	2.1 Conduct a user analysis, in order to determine a user profile and user needs 2.2 Determine the user content, and requirements 2.3 Determine the appropriate design principles for the site 2.4 Identify the appropriate operating system
3. Determine the site hierarchy	3.1 Identify the hierarchy of pages 3.2 Ensure that the content is logical and accessible to the user 3.3 Ensure that navigation between pages is consistent and clear
4. Integrate the design components	4.1 Apply the appropriate information hierarchy to the site design 4.2 Ensure that the design principles are appropriate to the business, and to the user 4.3 Ensure that the process flow is developed in a logical and simple manner 4.4 Test the site against user needs 4.5 Complete and document the design structure

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.4, 3.1-3.3	• Interprets, analyses, and syntheses, technical and organisational information to inform decision-making, to construct and validate solutions, and to produce responses to pre-determined requirements and work tasks
Writing	2.2, 3.2, 3.3, 4.5	• Develops content in a manner that supports and conveys information, using the appropriate structures, templates, software, and specialised language • Produces a logically sequenced text to convey exact procedural requirements and specific, and concise, instructions/meaning
Navigate the world of work	1.2	• Takes personal responsibility for adherence to the standards of industry bodies, where related to own work context
Interact with others	2.1, 2.2, 4.2	• Selects the appropriate communication protocols and conventions, when conferring with clients to elicit information, and to determine specific needs and requirements
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4	• Takes responsibility for planning, sequencing, and prioritising tasks within own workload, for efficiency and effective outcomes • Uses analytical processes to make routine and some complex decisions, to develop logical structures within the website information and operation that meet client needs • Understands the purposes, specific functions and , key features of common digital systems, tools and software, and operates them effectively to complete routine tasks

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB401 Design a website to meet technical requirements	ICAWEB401A Design a website to meet technical requirements	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB401 Design a website to meet technical requirements

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify and select, the appropriate tools and procedures required to develop a website
- conduct a user analysis to identify the website, or design structure, required
- define the user interface
- determine the site hierarchy
- test the website, to ensure that it meets the standards required by the user.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the basic aspects of information architecture
- describe the business process design
- outline copyright and intellectual property requirements
- provide an overview of the customer, and business, liaison
- detail e-business sites and corporate strategy
- describe the implications of technology connectivity
- explain the procedures for documenting technical specifications
- discuss the relevant standards relating to website design
- compare website design methods, and standard website structures
- recognise and define, common operating systems
- recognise and operate, common computer hardware.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to the:

- analysis software
- customer relationship model
- e-business website
- requirements documentation
- site server
- site server software
- web servers
- relevant standards, and copyright information.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB402 Confirm accessibility of websites for people with special needs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that a website is accessible to users with auditory, visual, mobility, and cognitive impairments, and those people who use assistive technology.

It applies to individuals who use analysis and technical skills, to build and test websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the accessibility standards	1.1 Research and identify, specific user groups with particular accessibility requirements 1.2 Identify general legislated and industry accessibility standards, and requirements, to understand the wider context of accessibility 1.3 Identify web development standards, and prioritise application 1.4 Consolidate specific and general standards, and requirements, into an accessibility checklist for application to website related work
2. Test for website accessibility	2.1 Select and prepare, the appropriate automatic testing tools and software 2.2 Run the automatic testing tools and make document changes, based on the results 2.3 Ensure that the text equivalent for every non-text element is present in the website, where feasible 2.4 Verify that information conveyed with colour is also available without colour 2.5 Identify any changes in the natural language of a document text 2.6 Check and ensure, that the document can be read without style sheets 2.7 Check and ensure that the priorities identified in the analysis of web development standards are met and completed 2.8 Test the site with different user groups, to ensure that the site transforms successfully and maintains accessibility
3. Test the pages	3.1 Check and ensure that the pages are not dependent on colour, and can operate in a monochrome environment 3.2 Check and ensure that the pages are logical and accessible, in a text-only environment 3.3 Verify that the pages operate on a text-to-speech browser 3.4 Ensure that the accessibility of the website is signed off by the appropriate person, as meeting the web-development standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.8	• Identifies, analyses, and evaluates complex texts to determine work requirements
Writing	1.4, 2.1, 2.2, 2.4-2.8, 3.1-3.4	• Uses specific software and technical language to format, review, and amend web-based documents and diagrams • Generates checklists that include accessibility standards criteria and other specific requirements
Oral Communication	2.8	• Participates in verbal exchanges with stakeholders, using listening and questioning to elicit information and to share viewpoints
Navigate the world of work	1.2, 1.3	• Takes personal responsibility for adherence to the regulatory and legislative standards related to own work context
Interact with others	3.4	• Selects and uses the appropriate conventions and protocols, to communicate with others in a specific work context
Get the work done	1.4, 2.1, 2.2, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4	• Accepts responsibility and the ownership of tasks, and makes decisions on completion parameters, and the need for consultation and coordination with others • Plans, sequences and prioritises tasks, and own workload, for efficiency and effective outcomes • Understands the purposes, specific functions and the key features of common digital systems, tools and software, and operates them effectively to complete a series of diagnostic tests, and tasks, that meet prioritised web development standards for accessibility

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTWEB402 Confirm accessibility of websites for people with special needs	ICAWEB402A Confirm accessibility of websites for people with special needs	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB402 Confirm accessibility of websites for people with special needs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify accessibility standards
- test a website for accessibility using a range of tools and tests
- check website documents and other web components for accessibility issues
- test web pages for accessibility.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe the relevant legislation, regulations and codes of practice, relating to access and equity
- describe the computing and programming standards that apply to access and equity
- describe the access and equity issues of web page design, in relation to:
  - customer and business liaison approaches, and processes
  - electronic commerce modelling language
  - government, advocacy group, and user group liaison
- discuss the application of privacy principles to website development, user access and user usage
- describe technical performance measurement principles
- describe the Web Accessibility Initiative (WAI)
- explain the importance of website accessibility, security, and equity legislation
- compare website design methods and standard website structures
- explain website security
- explain workload metrics
- list World Wide Web Consortium (W3C) standards.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a live website
- the requirements documentation
- the customer-relationship model
- automatic accessibility measuring tools
- organisational requirements and relevant standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB403 Transfer content to a website using commercial packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to transfer content, from a remote location to a web server, using a range of commercial information and communications technology (ICT) products. The objective is the successful upload of new, or revised, information on a website.

It applies to individuals who are required to update websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Configure the file transfer protocol client	1.1 Review and select the file transfer protocol (FTP) client, based on features and functions 1.2 Ensure that the file transfer protocol client is suitable for the technical environment 1.3 Enter client details, including the user identity (ID), password and the host name or ID, into profile fields to create a permanent profile 1.4 Choose settings such as auto-detect, save profile, and password, depending on organisational security and privacy policy, and the organisational guidelines 1.5 Test and verify, the configuration by connecting to the web-hosting server
2. Plan and prepare for the data transfer	2.1 Prepare the data content, and back it up on the local computer or server 2.2 Identify data as compressed, or uncompressed, with the tools available on the server to manage uploaded data 2.3 Ensure that the files are in an appropriate form for recognition and interaction by the operating system 2.4 Ensure that the receiving directory structure is applicable for the data to be uploaded
3. Establish the connection to server	3.1 Log on to remote server using administrative, guest or anonymous accounts 3.2 Proceed through the security layers, based on organisational guidelines 3.3 Initiate the file transfer protocol client program and locate the destination directory
4. Transfer the data to a remote server	4.1 Select files to be transferred and choose the mode, American Standard Code for Information Interchange (ASCII), or binary 4.2 Run the antivirus software on the downloaded files 4.3 Move, rename, copy, and delete files on the server as necessary, and as permissions allow 4.4 Store and order files, according to requirements and file extensions

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ELEMENT	PERFORMANCE CRITERIA
	4.5 Conduct appropriate steps for downloaded files, such as translation, decompression, or de-archival of the files for use 4.6 Confirm the data transfer and content functionality, and close the connection

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 1.5, 2.1-2.4, 3.2, 4.1-4.6	• Accesses and evaluates technical information, standards, and data, to ensure alignment between work requirements, implementation protocols and specified outcomes
Writing	1.3-1.5, 2.1-2.4, 3.1-3.3, 4.1, 4.3-4.5	• Uses specific standards, software and technical language to create, update, enter and verify data and information, according to work requirements, implementation protocols, and specified outcomes
Navigate the world of work	1.4, 3.2, 4.3, 4.4	• Takes personal responsibility for adherence to legislative requirements and the organisational policies and guidelines, related to own work context
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6	• Plans, sequences and prioritises tasks and own workload, for efficiency and effective outcomes • Understands the purposes, specific functions and the key features of common digital systems, tools and software, and operates them effectively, to complete a series of sequential tasks required to prepare, and transfer, data successfully to a website

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB403 Transfer content to a website using commercial packages	ICAWEB403 A Transfer content to a website using commercial packages	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB403 Transfer content to a website using commercial packages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- configure a file transfer protocol (FTP) client
- prepare the content to be transferred
- connect to the server
- transfer the content.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the process of transferring content to a website including:
  - the FTP server and the client software
  - internet protocols
  - security issues
  - server access security procedures
  - server operating systems
  - website server architecture (e.g. Linux, Windows, Unix)
- outline the range of organisational policies, and procedures, that impact on web site development
- identify and describe the legislation, regulations, and codes of practice as they relate to web design, including:
  - codes of ethics
  - privacy
  - copyright
  - intellectual property.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to the:

- web servers
- e-business website
- FTP client software
- server security password, and access procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB404 Maintain website performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure that a website maintains performance levels during peak traffic times, and full use access.

It applies to individuals who use planning and analytical skills to maintain and improve website performance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Benchmark website performance	1.1 Review client performance expectations, from the specifications and business requirements 1.2 Test the administration and maintenance requirements, against the specifications and business requirements 1.3 Establish performance benchmarks, from the specifications and business requirements 1.4 Ensure that performance benchmarks are tested 1.5 Record measured performance benchmarks against the specifications
2. Track website performance	2.1 Measure actual website performance against performance benchmarks in key areas and record the outcomes 2.2 Establish policies and procedures for maintaining the stability of actions and processes related to the website 2.3 Identify faults, or suggest improvements, to the website 2.4 Implement improvements according to the business requirements and organisational policy, and procedures 2.5 Establish automatic fault reporting procedures and processes 2.6 Monitor and maintain website security measures 2.7 Implement administration and maintenance schedules 2.8 Establish preventative maintenance and administration indicators, and ensure that an alert system is enabled 2.9 Track user activities and make changes to policies or procedures, depending on the findings
3. Tune performance	3.1 Compare actual website performance against benchmarks over an appropriate period, and make changes based on inconsistencies 3.2 Record performance inconsistencies, and incorporate learning, into revised policy and procedures 3.3 Use diagnostic and software tools, to identify and correct, any website faults 3.4 Plan and action, preventative maintenance on a regular basis to ensure the continuous and consistent performance of the website 3.5 Complete and record the fault, correction and maintenance

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ELEMENT	PERFORMANCE CRITERIA
	reports
4. Initiate and monitor performance improvement	4.1 Establish a mechanism for capturing client initiatives, to assist in identifying maintenance, or administration, or performance problems 4.2 Review the security tools, and procedures and conduct improvements, where necessary 4.3 Document and implement the maintenance schedules 4.4 Review the maintenance and administration documentation, according to policy and procedures, in order to identify areas for performance improvement 4.5 Update the website on a regular basis, including information, links, multimedia links, and back-end software 4.6 Provide a timely and appropriate response to the client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2-1.3, 2.1-2.9, 3.1	• Examines, constructs, organises and validates relationships between discrete, and interrelated, data and information
Writing	1.5, 2.2, 2.2, 2.9, 3.1, 3.2, 3.4, 3.5, 4.1-4.6	• Designs and develops, the procedural documents that convey critical performance information to end users • Modifies documents using on-going analysis of performance data and feedback • Prepares a well structure and cohesive document, that presents analysis of evidence and actions utilising the appropriate format, technical language, correct spelling and grammar
Numeracy	1.3, 1.5, 2.1, 3.1, 3.2, 3.5, 4.1, 4.4	• Assigns a numerical value to performance requirements, and uses measurement data to inform decisions, track performance, and establish actions to be taken in relation to the required work task
Navigate the world of work	2.2, 2.4, 2.9, 3.2, 4.4	• Takes personal responsibility for following, explicit and implicit, organisational policies relevant to own work • Implements revisions to existing policies and procedures, or initiates new policies, relating to website use and performance for others
Interact with others	4.6	• Selects and uses appropriate conventions and protocols, to communicate with others in a specific work context
Get the work done	1.1, 1.3, 1.4, 2.1, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.1, 3.3, 3.4, 4.1, 4.2, 4.3, 4.5	• Determines job specifications and requirements, and performs clearly defined tasks in a logical, systematic sequence • Uses analytical thinking and diagnostic processes • Understands the purposes, specific functions, and key features of common digital systems, tools and software, and operates them effectively

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB404 Maintain website performance	ICAWEB404A Maintain website performance	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB404 Maintain website performance

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review and establish, website performance benchmarks
- ensure that the website meets specifications
- identify and rectify faults, where the performance is not met
- implement scheduled and non-scheduled maintenance
- effectively monitor, and tune, website performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the process of maintaining a website performance including:
  - security issues
  - website server architecture (e.g. Linux, Windows, Unix)
  - website security protocols
  - workload (web traffic) metrics
- outline the business process design methodologies
- identify and describe legislation, regulations, and codes of practice as they relate to web performance, including:
  - codes of ethics
  - privacy
  - copyright
  - intellectual property.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- web servers and websites
- the technical requirements
- web traffic diagnostic tools, including timing tools to gauge website response times
- the appropriate learning and assessment support, when required
- the relevant organisational policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB405 Monitor traffic and compile website traffic reports

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor website traffic and to compile traffic reports as specified.

It applies to individuals who are required to maintain websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select web traffic monitoring tools	1.1 Identify and analyse the available site-analysis software, according to organisational requirements, and the website architecture 1.2 Choose and install the most suitable site-analysis software or internet service provider, according to the vendor requirements 1.3 Identify the required report options, according to organisational requirements and the website architecture 1.4 Develop a traffic monitoring program
2. Monitor web traffic	2.1 Specify the required traffic reports, according to information requirements 2.2 Generate the required traffic reports 2.3 Analyse the reports, to identify improvements to the server and to site performance 2.4 Apply forecasting methodologies to predict traffic peaks
3. Make recommendations for improvements	3.1 Recommend any changes in hardware and software 3.2 Implement the changes, as directed 3.3 Continue the traffic monitoring program, as required

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 2.3	• Identify, analyse and evaluate, a range of organisational documents and technical information
Writing	1.4, 2.1-2.3, 3.1	• Constructs a data collection tool, incorporating the timelines and information to be collected • Prepares a technical report, using the appropriate punctuation, language and layout, in order to convey the results and recommendations of investigations
Numeracy	1.3, 1.4, 2.3, 2.4	• Evaluates and presents, numerical and statistical data, to inform decisions and actions
Navigate the world of work	1.1, 1.3, 2.1	• Takes personal responsibility for following explicit and implicit organisational requirements, relevant to own work
Interact with others	3.1, 3.2	• Selects and uses the appropriate conventions and protocols, when communicating in a range of familiar work contexts
Get the work done	1.1, 1.2, 1.4, 2.2, 2.4, 3.1, 3.2, 3.3	• Determines job specifications and requirements, and performs clearly defined tasks in a logical, systematic sequence • Uses analytical thinking and diagnostic processes, to monitor the web server and site performance, and to suggest improvements • Understands the purposes, specific functions, and key features of common digital systems, tools and software, and operates them effectively to monitor website traffic to meet requirements

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTWEB405 Monitor traffic and compile website traffic reports	ICAWEB405A Monitor traffic and compile website traffic reports	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB405 Monitor traffic and compile website traffic reports

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- select and install the site-analysis software, or an internet service provider (ISP)
- monitor website traffic
- generate and analyse traffic reports
- recommend and implement changes, as required.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the problems and challenges that arise with an organisation web site related to:
  - data queues and bottlenecks
  - website security
  - website copyright and intellectual property requirements
- identify and describe legislation, regulations, and the codes of practice as they relate to monitoring website traffic, including:
  - codes of ethics
  - privacy
- describe the process of monitoring website traffic, including:
  - functionality of network device drivers
  - functionality of network operating systems
  - queuing systems
  - website architecture
  - workload metrics
  - server design and functionality
- outline the features and functionality of commercially available:
  - log file analysis software
  - traffic tracking software
  - network device drivers
  - network operating systems
  - queuing systems.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- analysis software
- the e-business website
- a web server

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB406 Create website testing procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and implement procedures, which measure the performance of a website, and compare these procedures to the initial design specifications.

It applies to individuals who may use significant judgement in planning, design, evaluation, technical or leadership and communications functions in frontline technical support roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Document and define the performance criteria	1.1 Review the performance specifications and determine the benchmark criteria 1.2 Validate and document the performance functions 1.3 Select the measurement methodology, and test it on the website 1.4 Validate each performance function separately 1.5 Record and document the metric tools, using the appropriate methodology 1.6 Prepare the performance benchmarks, and seek agreement on the criteria with the client
2. Validate the performance measures	2.1 Develop inspection and test plans, in order to validate performance measures throughout the performance cycle 2.2 Test the performance functions, and record the results, according to technical documentation standards 2.3 Compare the results of performance function testing to benchmark 2.4 Redesign functions that do not meet the appropriate performance benchmarks 2.5 Re-implement functions that have been redesigned during performance testing 2.6 Document the benchmarks and obtain sign-off
3. Obtain sign-off	3.1 Validate and document, performance standards and benchmarks 3.2 Submit the methodology and function testing document, and results, to the client for approval 3.3 Review client comments and make changes, as appropriate 3.4 Obtain sign-off for the website testing procedure

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.6, 2.1-2.5, 3.1, 3.3	• Evaluates, integrates, and confirms the authenticity of the data and information, to reach an understanding of the contextual and procedural nature of business solutions
Writing	1.2, 1.5, 1.6, 2.1, 2.2, 2.6, 3.1-3.3, 3.4	• Develops and documents benchmark standards, performance plans, measurements, and detailed results, and recommendations for client approval • Uses the appropriate formats and writing principles, in accordance with technical standards and organisational conventions
Oral Communication	1.6, 2.6, 3.2-3.4	• Participates in complex verbal exchanges with clients that require active listening and responses to questions, to elicit relevant and specific information, and to obtain feedback, and consensus
Numeracy	1.1-1.6, 2.1-2.6, 3.1	• Measures and evaluates performance, against established baseline numerical values
Navigate the world of work	2.2, 2.6	• Takes personal responsibility for following explicit, and implicit, organisational requirements relevant to own work
Interact with others	1.6, 3.2, 3.4	• Selects and uses, the appropriate conventions and protocols, when communicating in a range of familiar work contexts
Get the work done	1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	• Uses analytical thinking, systematic decision- making and diagnostic processes, to determine, implement and evaluate, testing and validation processes • Understands the purposes, specific functions and the key features of common digital systems, tools and software, and operates them effectively, to perform testing procedures to meet requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB406 Create website testing procedures	ICAWEB406A Create website testing procedures	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB406 Create website testing procedures

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the critical functions to be tested
- develop the appropriate metrics for each function, and assign the benchmarked performance standards
- test each performance function, and compare against the appropriate benchmarks
- validate the performance of the site against technical requirements
- document the results, to establish performance benchmarks for subsequent development of the site.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe the legislation, regulations, codes of practice, and standards as they relate to web testing, including:
  - codes of ethics
  - privacy
  - copyright
  - intellectual property
  - naming
  - documentation
- describe the client business domain, including client organisation structure and business functionality
- identify current industry-accepted hardware and software products
- outline the desktop applications and operating systems, as required by organisational guidelines
- describe queuing systems, workload metrics, and user request classes
- describe the key features, and use of, a standard generalised markup language (SGML) and its associated standards
- explain standard web-testing procedures and optimisation tools
- outline website design methodologies and standard website structures.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- analysis software
- the e-business website
- industry standards, and organisational guidelines
- site design and technical requirements documentation
- site-development software and tools.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB407 Conduct operational acceptance tests of websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide high-level assurance, that websites can be effectively and efficiently provisioned and deployed live, in a systematic manner.

It applies to individuals employed as web designers and web developers who are involved in testing the effectiveness of websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare the test	1.1 Establish and document, the testing framework and schedule 1.2 Determine the processes and functions to be tested, and assign the quantitative and qualitative performance benchmarks to each process and function 1.3 Benchmark and document the page templates, style guides and expected traffic loads 1.4 Determine and document the test methodology 1.5 Assemble and brief, the testing panel on the conduct of the test 1.6 Develop user and installation manuals, according to the target audience's understanding and needs
2. Test individual pages	2.1 Test the pages, against style guides and templates 2.2 Test the pages, for consistency in structure and content 2.3 Apply the automatic testing software 2.4 Document page gross statistics of confirmed results of tests
3. Test page relationships against the business requirements	3.1 Test the installation, and the examples listed in instruction manual 3.2 Test page navigability using a variety of browsers 3.3 Test the ease of use and functionality against the requirements 3.4 Test software interface points, against the business and technical requirements 3.5 Test site security and privacy against the business requirements 3.6 Test the response time against the business requirements 3.7 Conduct load simulation testing, using single and multiple independent browsers, or automated load testing tools
4. Apply and document further tests	4.1 Test the website's ability to handle concurrent access 4.2 Test conformance to the applicable privacy, accessibility, and acceptable usage policy standards 4.3 Apply the automatic testing software 4.4 Collect, collate and document the results from the sample user, and data from the automated test

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ELEMENT	PERFORMANCE CRITERIA
5. Evaluate the test results	5.1 Consolidate and compare the results to the benchmarks 5.2 Identify results that fail to meet the benchmarks, and conduct a site remedial iteration 5.3 Record and document the test results as the site performance baseline, against which further development or updating can be measured 5.4 Provide evaluation feedback to the appropriate person 5.5 Ensure that the appropriate person signs off on the site, prior to the 'go live' date

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.1-2.3, 3.1-3.7, 4.1, 4.2, 5.1, 5.2	• Examines, constructs, organises and validates relationships, between both discrete and interrelated data and information
Writing	1.6, 2.4, 4.4, 5.1-5.5	• Produces a concise formal document that conveys technical information and procedures, utilising the appropriate format, technical language, correct spelling and grammar • Uses specific software and technical language to create, format, review, save and access documents
Oral Communication	1.5, 5.4, 5.5	• Conveys information by participating in verbal exchanges including listening, questioning and discussing, data and information with a group of people in order to elicit an understanding of, and obtain a consistency of approach to, work requirements • Uses clear and detailed verbal language in order to convey explicit information, and to elicit approval for proposed solutions and activities
Numeracy	1.2, 2.4, 5.1, 5.3	• Determines analyses and presents, numerical and statistical, data to inform the decisions and actions to be taken to achieve pre-determined outcomes
Navigate the world of work	3.4, 3.5, 3.6, 4.2,	• Ensures compliance of the product against business requirements and against the protocols
Get the work done	1.1-1.6, 2.1-2.4, 3.1-3.7, 4.1-4.4, 5.1-5.5	• Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Develops options, resolves issues, designs and implements tests, to ascertain the functionality of solutions prior to full implementation • Utilises a combination of lateral and analytical thinking, to design, and refine, ideas to suit needs, resources and constraints • Uses a range of digitally-based technologies and the software packages and hardware required for creating, and refining, websites

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB407 Conduct operational acceptance tests of websites	ICAWEB407A Conduct operational acceptance tests of websites	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB407 Conduct operational acceptance tests of websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare an operational acceptance test that measures the independent and integrated structural content, and the technical components, of the site
- apply automatic testing software and collect, collate and document the results or tests
- evaluate and provide feedback on the test results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the client business domain
- describe the structure, function and business organisation of the client, including the business-process design
- identify the organisational policies and procedures that cover routine work processes, and the use of:
  - web optimising tools
  - web monitoring tools
  - web testing procedures
- describe technical performance measurement
- explain website accessibility and equity principles
- outline website structures, design and testing methodologies, and standards
- describe common website security issues and the methods employed to mitigate risk
- list and describe, common testing software and the metrics used
- identify and describe, the application of common website testing software.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the website technologies field of work, and include access to:

- special purpose tools, equipment and materials including:
  - web servers
  - the e-business website
  - the site server
- relevant industry software packages, including site server software and analysis software
- the organisational requirements documentation, customer relationship model, website manuals and instructions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB408 Ensure basic website security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide basic website server, and protocol security appropriate to the level required by an organisation.

It applies to individuals employed as web maintenance staff who are required to ensure that a website meets basic security requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine business security requirements	1.1 Identify the level of security required based on the business, and the commercial intent of the website 1.2 Identify whether password protection is needed for the site, or part of the site 1.3 Decide on minimum or maximum password protection solutions, based on the business requirements
2. Ensure web server security	2.1 Ensure that the web server password is obscure and non-traceable 2.2 Install and maintain an effective intrusion detection system, according to business requirements 2.3 Ensure that user accounts have only the required permissions on the server 2.4 Ensure that interpreters' programs, that run common gateway interfaces (CGIs), are not stored in the CGI-bin directory 2.5 Ensure that web forms check data before passing it to the server
3. Ensure protocol security	3.1 Protect the fixed internet connection, and the internet protocol (IP) address 3.2 Protect shared network resources from intrusion, according to business requirements 3.3 Ensure that personal computer (PC) protocols and preferences follow security protocols 3.4 Disable control protocol, or internet protocol (TCP/IP), bindings for file and printer sharing 3.5 Ensure that network basic input/output system (NetBIOS) over TCP/IP is disabled

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.5, 3.1-3.5	• Identify and evaluate technical information to produce solutions to business requirements • Identify critical information and cross check for accuracy
Writing	2.2, 3.1-3.5	• Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Oral Communication	1.1, 1.2	• Listens and asks questions to elicit information
Navigate the world of work	1.3	• Ensures the compliance of the product against the business requirements and protocols
Get the work done	1.1-1.3, 2.1-2.5, 3.1-3.5	• Plans approach to work based on the analysis of business needs and requirements • Sequences, schedules and prioritises own work activities • Resolves issues and implements tests, to ascertain the functionality of solutions prior to full implementation • Utilises a combination of lateral and analytical thinking, to evaluate and validate reliability, and the efficacy of the website • Uses a range of digitally-based technologies, and the software packages and hardware, required for interrogating vendor databases and websites

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB408 Ensure basic website security	ICAWEB408A Ensure basic website security	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB408 Ensure basic website security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the level of security required by the business for the website
- implement password protection solutions, for the website and the server
- install and maintain, an intrusion detection system
- implement protocol security.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the client business domain, including the client organisation structure and business functionality
- identify current industry-accepted hardware and software products
- outline desktop applications and operating systems, as required
- describe firewall functionality
- describe hypertext transfer protocol (HTTP) and disk and executing monitor tools (daemons)
- outline the range of security protocols, including:
  - secure socket layer (SSL)
  - point-to-point network tunnelling protocol (PPTP)
  - layer 2 tunnelling protocol (L2TP)
- define security patches
- explain specific purpose security computers, acting as bastion hosts
- explain web-server operating systems.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the website technologies field of work, and include access to:

- special purpose tools, equipment, materials
- industry software packages
- a basic website and web servers
- the organisational requirements documentation
- website manuals and instructions.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB409 Develop cascading style sheets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0

Application

This unit describes the skills and knowledge required to develop cascading style sheets (CSS) that are attached to a markup language document, in order to externally define, and control, styles to enhance and achieve commonality between web documents.

It applies to individuals who are required to layout and ensure consistency of appearance between web pages.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Format, style and lay out the elements on a web page	1.1 Obtain user requirements 1.2 Style the elements of a web page using CSS 1.3 Apply CSS to multiple pages in a website 1.4 Position the document elements using CSS
2. Test and validate the web pages	2.1 Test the website in various browsers 2.2 Validate CSS against industry standards 2.3 Report the test results to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1, 2.2	• Identifies, interprets and uses information from technical and business documents to complete a work task
Writing	1.1-1.4, 2.3	• Uses specific software and technical language to create, format, review, save and access web- based documents, diagrams and images
Oral Communication	1.1, 2.3	• Identifies work outcomes through open-ended questioning, active listening, paraphrasing and summarising • Uses clear and detailed verbal language in order to convey explicit information
Numeracy	1.2-1.4	• Extracts and evaluates the mathematical information embedded in a range of tasks and texts • Takes measurements and performs calculations for website layout
Navigate the world of work	1.1, 2.2	• Completes work to user requirements and industry standards
Get the work done	1.1-1.4, 2.1-2.3	• Sequences and schedules complex activities within the specified timeframe, monitors implementation, and manages relevant communication • Analyses documentation in order to apply and obtain desired results, and to resolve problems • Utilises a combination of lateral and analytical thinking, to design and refine solutions that are adaptable to different contexts • Uses a range of digitally-based technologies, and the software packages and hardware required

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB409 Develop cascading style sheets	ICAWEB409A Develop cascading style sheets	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB409 Develop cascading style sheets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0

Performance Evidence

Evidence of the ability to:

- develop a website style and format, using cascading style sheets (CSS), to user requirements
- lay out page elements, using CSS
- test web pages in a variety of browsers
- validate the CSS against industry standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss standard web and CSS design principles
- identify and describe the application of the following to CSS:
  - hypertext transfer protocol (HTTP)
  - hypertext mark-up language (HTML)
  - extensible hypertext mark-up language (XHTML)
  - industry standards for web design
- recognise a range of internet browsers.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the website technologies field of work and, include access to:

- special purpose tools, equipment and materials
- industry software packages
- a computer
- a variety of web browsers
- the organisational requirements documentation including:
  - an aesthetic presentation brief
  - website manuals
  - HTML documents
- the internet, for access to the World Wide Web Consortium (W3C).

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB410 Apply web authoring tool to convert client data for websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0

Application

This unit describes the skills and knowledge required to use web development software to create website content. The unit is designed to use a web-authoring tool to convert text and images to the appropriate web protocols.

It applies to individuals employed as web developers who are responsible for developing websites using client data.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create the files	1.1 Create files and save, in the correct location and directory 1.2 Insert and format text content, according to the business requirements 1.3 Insert and optimise images, as required
2. Create the formatting templates	2.1 Create basic external cascading style sheets (CSS) 2.2 Define styles for the required tags, according to the business requirements 2.3 Link CSS to the files, and display formatting
3. Define library items	3.1 Identify items that recur on several pages, and include in the library 3.2 Format selected items, according to CSS definition 3.3 Check the tags of selected items 3.4 Create and clearly name, the selected library items 3.5 Update the items contained in the library, according to the business requirements
4. Develop the templates	4.1 Create and save file as template, and link with CSS 4.2 Format the template and create, and name, editable regions 4.3 Place the generic image icons in a page, as required by the business image 4.4 Save and modify the templates
5. Identify the authoring requirements	5.1 Select the preferred web authoring tool, according to the business requirements 5.2 Set the preferences for the web-authoring tool, including the site file transfer protocol (FTP) client 5.3 Customise and navigate, the web author tool environment or workspace, to meet individual requirements 5.4 Select buttons and tools, both opened and closed, to access the full range of features 5.5 Define and name the site and root folder
6. Create simple forms	6.1 Add form elements to the page

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ELEMENT	PERFORMANCE CRITERIA
	6.2 Set the form element properties for each form element 6.3 Insert additional fields, as required for the processing form 6.4 Identify the availability, and location, of the common gateway interface (CGI) script 6.5 Connect the form to a script in a server CGI bin 6.6 Test the form to ensure that there are no errors
7. Create simple navigation	7.1 Create the site map in order to plan navigation 7.2 Create the links between pages to reflect the content structure, using both text and images 7.3 Check the links in multiple browsers for errors 7.4 Check the website content across a number of different browsers, and browser versions, to ensure consistency of presentation, performance and accessibility

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 3.1, 3.2, 3.5, 5.1-5.5	• Identifies, and interprets, information from technical and business documentation to complete a work tasks, according to the business requirements and technical specifications
Writing	1.1-1.3, 2.1-2.3, 3.2, 3.4, 3.5, 4.1-4.4, 5.2-5.5, 6.1-6.5, 7.1-7.3	• Uses specific software and technical language to create, format, review, save and access web based documents, templates, diagrams and images • Electronically enters data and information that meet business requirements, and adheres to the technical requirements and specifications
Navigate the world of work	1.1, 2.2, 3.5, 5.1	• Completes tasks in accordance with the specified business requirements
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.5, 4.1-4.4, 5.1-5.5, 6.1-6.6, 7.1-7.4	• Prioritises and monitors own work • Solves operational problems, as they arise • Analyses the business requirements and interprets the technical aspects of implementation • Designs simple forms • Operates software applications, selects the appropriate authoring tools to meet the required specifications, and writes and maintains, the hypertext markup language (HTML)

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTWEB410 Apply web authoring tool to convert client data for websites	ICAWEB410A Apply web authoring tool to convert client data for websites	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB410 Apply web authoring tool to convert client data for websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop web content, using authoring tools to meet the business requirements
- create cascading style sheets (CSS)
- define library items
- create templates
- use authoring tools to create cross-browser web documents
- create forms
- create navigation tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and describe, the client business domain
- identify and describe the legislation, regulations, codes of practice and standards, as they relate to websites
- outline the accessibility guidelines regarding web-authoring tools
- explain the standard generalised markup language (SGML), and describe the associated standards
- describe standard web and CSS design principles and structures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the website technologies field of work, and include access to:

- special purpose tools, equipment and materials
- industry software packages
- the website, where content may be developed
- site authoring software and tools
- the business expectations brief
- the appropriate standards, and current legislation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB411 Produce basic client-side script for dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0

Application

This unit describes the skills and knowledge required to develop interactive and engaging websites, using a range of features from various, appropriate languages.

It applies to individuals working in web development environments who are required to produce client-side scripts as a common means of creating interactive websites. These scripts offer an effective simple means of enabling websites to provide greater interaction with clients.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the requirements for web documents	1.1 Determine the necessary dynamic functionality of the web document 1.2 Determine the appropriate language to achieve that functionality 1.3 Determine the web document requirements
2. Design and produce web documents	2.1 Design the web document, and embedded scripts to achieve the required functionality 2.2 Write a simple hypertext markup language (HTML), considering accessibility 2.3 Write embedded scripts
3. Test the scripts and debug	3.1 Test the web document against the required functionality, and reiterate until correct 3.2 Complete the documentation and submit it to the appropriate person for their approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3	• Recognises and interprets textual information in various information and communications technology (ICT) languages, in order to determine the dynamic functionality of the web document
Writing	1.1, 1.3, 2.1, 2.2, 2.3, 3.2	• Develops material for a specific audience, using detailed ICT language, to convey explicit information
Oral Communication	1.1, 1.3	• Articulates clearly, using the specific language suitable to technical, operational and business audiences, to convey requirements and listening, and questioning, techniques to confirm understanding
Get the work done	1.1-1.3, 2.1-2.3, 3.1-3.2	• Plans approach to work based on internet protocols, and the analysis of business needs and requirements • Sequences, schedules and prioritises own work activities • Resolves issues, including design and functionality conflicts, debugging and handling errors, and implements tests to ascertain the functionality of solutions, prior to full implementation • Utilises a combination of lateral and analytical thinking, and practice, to design and validate the reliability, and efficacy of web documents • Uses a range of digitally-based technologies, software packages, and hardware to view the active elements or objects across different platforms, and to design, and produce, web documents

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB411 Produce basic client-side script for dynamic web pages	ICAWEB411A Produce basic client-side script for dynamic web pages	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB411 Produce basic client-side script for dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the dynamic functionality and requirements of web documents
- select the appropriate language
- design web documents with embedded script
- produce dynamic web page documents
- test and debug, the web document functionality
- document and gain client approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- discuss the basic principles behind open platform programming
- describe client-side scripting and its application to dynamic web page design, including:
  - events and event handlers
  - internet operation related to servers and clients
  - internet protocols
  - standard generalised markup language (SGML)
  - associated standards
- identify and outline, security restrictions on servers
- describe the difference between server-side and client-side scripting
- describe the standards associated with programming documentation.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the website technologies field of work, and include access to:

- special purpose tools
- equipment and materials
- industry software packages
- the web server
- the client requirements
- the security policy
- functionality and scope requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB412 Produce interactive web animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create interactive animated enhancements, to advertisements and web pages.

It applies to individuals working as web designers who generate and apply advertisements for website clients, create animations to enhance a web page message and produce fully animated websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse project requirements	1.1 Determine the necessary dynamic functionality of the animation to be included inside the web document 1.2 Determine the appropriate language to achieve that functionality 1.3 Determine web document requirements 1.4 Research and evaluate, current requirements for online advertising with major agencies and websites
2. Design the web animations	2.1 Design the web document and animations, to enhance the page 2.2 Design the advertisements to promote the web page, within a website 2.3 Design the advertisements to promote the web page, on externally hosted, paid advertising 2.4 Design advertisements that meet current website advertising specifications for size, number or loops, sound and buttons 2.5 Design and create gif replacements for animation, as per major advertising agency requirements 2.6 Design the animations for a website that will add to the overall professionalism, or entertainment value, of a website
3. Produce the animations	3.1 Produce the web animations, for web pages 3.2 Produce the web animations, for external advertising 3.3 Produce the web animations, for internal website advertising 3.4 Produce the web animations, for a website that will enhance the overall professionalism, or entertainment value, of the website 3.5 Test and debug, scripts against the required functionality and reiterate until correct
4. Publish animations	4.1 Publish the animations in an acceptable web format 4.2 Incorporate the web animations into a hypertext markup language (HTML) page 4.3 Complete the documentation and submit it to the appropriate person for their approval

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.4, 2.1, 2.2, 2.3, 3.4	• Identifies and explores, connections between ideas and methodologies, and uses research techniques to source the knowledge required to resolve technical difficulties, and the extend understanding of the job's requirements
Reading	1.4, 2.4, 2.5	• Analyses and compares industry-specific and related text, to determine all advertising, client and technical requirements
Writing	1.1	• Prepares, and produces, dynamic material for a specific audience using clear and detailed language in order to convey explicit information, requirements and recommendations
Oral Communication	1.1	• Clearly articulates requirements, using the language appropriate to the audience and environment, and participates in a verbal exchange of ideas/solutions
Numeracy	2.4	• Interprets numerical information, and applies basic mathematical calculations, to recurring technical features
Get the work done	1.1-1.4, 2.1-2.6, 3.1-3.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB412 Produce interactive web animation	ICAWEB412A Produce interactive web animation	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB412 Produce interactive web animation

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the requirements for the animation
- design the interactive animations requirements
- create animations for web pages and advertising applications
- publish the animations to the web environment.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline web animation programming concepts, including:
  - acceptable formats for importing assets
  - component libraries
  - cross-browser issues
  - importing and exporting libraries
  - inserting the published work to a hypertext markup language (HTML), or extensible hypertext markup language (XHTML) page
  - internet-animation player statistics
  - masking
  - movements and automated movements
  - publishing the finished work to an acceptable web format
  - shape animation and manipulation
  - symbols
  - text manipulation
  - transparencies
- explain programming control structures, object-oriented programming, including:
  - buttons
  - scripting to go to uniform resource locators (URLs)
  - scripting to jump to different parts of the animation
  - scripting using the programming language
- summarise internet technology, including selecting the right scripting type to reach a maximum determined audience
- outline the principles of the analysis of web parameters, and the design of suitable animations, for advertisements and website enhancements
- explain the methods and attributes of animation, and how it enhances the website to entice buyers.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a development environment
- the internet
- browsers
- the appropriate web design software.

Assessors must satisfy NVR/AQTF assessor requirements.

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Links

Companion volumes available from the IBSA website:
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ICTWEB413 Optimise search engines

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create and implement, good internet-marketing practices using search engine optimisation (SEO) techniques, including introducing web pages to search engines, and monitoring search engine performance.

It applies to individuals who make recommendations and monitor keyword enhancements, search engine marketing (SEM) and social network marketing (SNM).

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse internet-marketing requirements	1.1 Determine the main business of the website, and the keywords currently used on each page 1.2 Create a keyword suggestion list for the website, using online tools 1.3 Analyse the best keywords for macro and sub-keywords 1.4 Create recommendations for improved optimisation for image search optimisation (ISO), keyword density on web pages, and keywords used in headings and heading levels meta-elements and page tiles 1.5 Analyse the pages, and recommend sections for content 1.6 Analyse the current website position in organic listings 1.7 Analyse the current success of online advertising 1.8 Analyse current traffic analysis reports, using online tools and the web-hosting statistics 1.9 Analyse the current success of the social network marketing content
2. Prepare an internet marketing strategy report	2.1 Use detail from the analysis to prepare a recommendation report for the client, covering the differences between search engine optimisation, search engine marketing, and social network marketing 2.2 Make recommendations about search engines and social network media to the target, based on the volume of users 2.3 Make recommendations regarding a timeframe for expecting improved search engine results 2.4 Explain the search terms 2.5 Make recommendations for the implementation of search engine optimisation, and search engine marketing, including a summary of recommendations on the methods to improve search engine rankings, both organic and pay per click (PPC)
3. Implement the SEO strategy	3.1 Implement the macro and sub-keywords on pages 3.2 Implement keywords 3.3 Implement the sections for content, and back links from quality websites

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ELEMENT	PERFORMANCE CRITERIA
	3.4 Create online profiles for updating search engine data 3.5 Introduce the website to major search engines
4. Review the SEO	4.1 Determine current website position in organic listings 4.2 Review the current success of online advertising with regard to the website's position 4.3 Evaluate current traffic analysis reports, and compare these with previous results
5. Prepare a client SEO result report	5.1 Analyse website statistics, for site reports and listings 5.2 Compare current statistics with previous site reports and listings 5.3 Summarise the findings, and make further recommendations

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 4.3, 5.1, 5.2	• Critically analyses complex documentation from a variety of sources, and consolidates the information relating to specific criteria, to determine requirements
Writing	1.2, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.4, 3.5, 5.1, 5.3	• Accurately records and completes organisational documents, and correspondence, using clear language and the correct spelling, grammar and terminology
Oral Communication	1.1, 2.2, 2.3, 2.4, 2.5, 5.3	• Uses collaborative and inclusive techniques, including active listening and questioning, and the reading of verbal and non-verbal signals, to convey and clarify information, and to confirm understanding
Numeracy	2.2, 2.3, 5.1, 5.2	• Interprets statistical information, and compares information, to measure usage and prepare client reports • Uses mathematical calculations to estimate timeframes for improved search engine results
Get the work done	1.1-1.9, 3.1-3.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes to determine a solution • Contributes to continuous improvement of current work, by applying basic principles of analytical and lateral thinking • Uses familiar digital technologies and systems to access information, search and enter data and code, present information and communicate with others

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB413 Optimise search engines	ICAWEB413A Optimise search engines	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB413 Optimise search engines

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse internet marketing requirements
- prepare and implement, an internet search engine marketing strategy
- monitor search engine performance
- make recommendations for:
  - keyword enhancements
  - search engine marketing (SEM)
  - social network marketing (SNM).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe internet marketing methods and best practices, including:
  - search terms
  - keywords
  - keyword density
  - search engine ranking
  - search engine methods of assessing search engine optimisation (SEO)
  - back links
  - social network media in the context of SEO
- analyse and interpret, the internet marketing strategy of a website.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in website technologies field of work, and include access to the:

- website files
- file transfer protocol (FTP)
- internet
- profiling tools
- social network marketing logins.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB414 Design simple web page layouts

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to scope web page requirements, and to create and implement designs.

It applies to individuals working as web designers and web developers, who apply a wide range of knowledge and skills for basic web development.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify main layout sections from design specification	1.1 Identify the required sections of the web page 1.2 Create the web page structure
2. Layout the web page to match design specification	2.1 Position document elements 2.2 Style web page elements to match the design specifications
3. Test and validate the layout	3.1 Test the website in various browsers 3.2 Validate the web pages against industry standards

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1	• Identifies and explores, the connections between ideas and methodologies to extend the understanding of requirements
Reading	2.2, 3.2	• Recognises and interprets textual information, in order to determine and adhere to, requirements
Writing	1.1	• Develops clear and well-organised material for a specific audience, using precise language to convey explicit information, and requirements
Oral Communication	1.1	• Clearly articulates requirements, using the language appropriate to the audience and environment, and participates in a verbal exchange of ideas/solutions
Numeracy	1.2, 2.1	• Takes measurements, and performs calculations for the web page layout
Navigate the world of work	3.2	• Identifies and acts on issues that contravene the relevant industry standards
Get the work done	1.2, 2.1, 2.2, 3.1, 3.2	• Takes responsibility for planning, sequencing, and prioritising tasks and own workload, for efficiency and effective outcomes • Addresses less predictable problems, and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter data, and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB414 Design simple web page layouts	ICAWEB414A Design simple web page layouts	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB414 Design simple web page layouts

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a website according to design specifications
- lay out page elements
- test the web pages in a variety of browsers
- validate the web pages, against industry standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise standard web and web scripting design principles
- define and explain the application of the following for website development:
  - cascading style sheets (CSS)
  - the hypertext transfer protocol (HTTP)
  - a markup language, such as hypertext markup language (HTML), or extensible hypertext markup language (XHTML)
  - World Wide Web Consortium (W3C) standards.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a computer
- an aesthetic presentation brief
- a variety of browsers
- the internet, to validate against the W3C.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB415 Produce server-side script for dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce server-side scripts for dynamic web pages, using a range of relevant features from different but appropriate languages.

It applies to individuals working as web designers who apply a wide range of knowledge and skills across different information and communications technology (ICT) environments to support small to medium enterprises (SMEs) that require broader, rather than more specialised, ICT support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the requirements for web documents requiring server-side dynamic interaction	1.1 Determine the necessary dynamic functionality of the web document 1.2 Determine the appropriate language, to achieve that functionality 1.3 Determine web document requirements
2. Design server-side scripts	2.1 Design the web document and server-side code, to interact with an external data source 2.2 Design the web document and server-side code, to allow an administrator to insert, update, and delete entries to the external data source 2.3 Implement security features in the web document
3. Produce the web documents	3.1 Write the extensible hypertext markup language (XHTML), considering accessibility 3.2 Write server-side scripts to current XHTML standards
4. Test the scripts and debug	4.1 Test the web document against required the functionality and reiterate until correct 4.2 Complete the documentation and submit it to the appropriate person for their approval
5. Set up security	5.1 Determine the necessary permissions to prevent error messages displaying to the public 5.2 Configure server software to minimise potential database attacks

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3	• Identifies, analyses and evaluates workplace instructions and technical documentation, to determine all business requirements
Writing	2.2, 2.3, 3.1, 3.2, 4.2	• Develops clear and well-organised material for a specific audience, using precise language to convey explicit information requirements and recommendations
Oral Communication	1.1, 1.3	• Clearly articulates requirements using the language appropriate to the audience, and participates in a verbal exchange of ideas/solutions
Navigate the world of work	3.2	• Identifies and complies with the current standards
Interact with others	4.2	• Uses a range of strategies to establish a sense of connection, and to build rapport, with clients and co-workers
Get the work done	1.2, 2.1, 2.2, 2.3, 4.1, 5.1, 5.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB415 Produce server-side script for dynamic web pages	ICAWEB415A Produce server-side script for dynamic web pages	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB415 Produce server-side script for dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create dynamic web pages according to all job requirements, using server-side scripting to retrieve information from a web-hosted database
- create scripts for:
  - the quick upload of data to web-hosted databases
  - inserting, updating, and deleting data from a web server database
  - encoding passwords
  - uploading and retrieving images
  - managing sessions, and creating a secure login.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain server-side technologies, and the relevant web scripting languages
- discuss server-side web analysis and design parameters
- summarise and apply, programming control structures and object-oriented programming
- outline web-programming concepts including:
  - the hypertext transfer protocol (HTTP)
  - stateless programming
  - session management
  - authentication and web security.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to the:

- client requirements
- functionality and scope requirements
- security policy
- database server
- internet and server
- software development environment
- web browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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ICTWEB416 Customise content management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create and integrate, a website into an open-source content management system.

It applies to individuals working as web developers who apply a wide range of knowledge and skills, across ICT, to support small to medium enterprises (SMEs) that require broader, rather than more specialised, ICT support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the specifications and requirements	1.1 Determine the required functionality of the website 1.2 Determine the appropriate server-side language that will be used to produce the website 1.3 Determine the content structure and navigation of the website 1.4 Determine the pre-existing restraints that need to be considered when developing a website solution
2. Research the requirements	2.1 Research the appropriate solutions, based on website requirements, including the programming language, content management system (CMS), licensing structure and hosting structure 2.2 Research the techniques, plug-ins and additions to the existing content management system, in order to allow the solution to fulfil the needs determined while analysing website requirements
3. Create a content-management system powered website	3.1 Install and configure the chosen CMS 3.2 Insert and manage, the website content 3.3 Install and implement the appropriate techniques, and plug-ins
4. Validate and evaluate the final website	4.1 Validate the final website markup against current website standards 4.2 Validate the content management system performance in different browsers, checking compatibility, and core content management system functionality

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1, 1.2, 1.4, 2.1, 2.2	• Researches, analyses and validates information to determine the best solution for client requirements, and builds on prior knowledge to extend understanding
Reading	1.1, 1.2, 2.1, 2.2	• Identifies, analyses and evaluates industry standards, workplace instructions, online and other technical documentation, to determine all business requirements
Writing	3.2	• Develops clear and well-organised material for a specific audience, using precise language to convey explicit information requirements, and recommendations
Oral Communication	1.1, 1.2	• Clearly articulates requirements, using language appropriate to the audience and participates in a verbal exchange of ideas/solutions
Navigate the world of work	2.1	• Takes personal responsibility for following explicit and implicit requirements for licencing policies, procedures and regulatory requirements
Get the work done	1.1-1.4, 2.1-2.2, 3.1-3.3, 4.1, 4.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems, and initiates standard procedures in response to these problems, applying problem-solving processes in determining solutions • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB416 Customise content management system	ICAWEB416A Customise content management system	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTWEB416 Customise content management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research and evaluate client requirements
- create a content management system (CMS) powered website using an open-source solution
- validate the CMS against the standards set by the World Wide Web Consortium (W3C).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- define "content management system" and describe its purpose
- explain markup language and its associated standards
- outline server-side language and security techniques
- discuss web accessibility
- evaluate a content management system (front and backend) in commonly used browsers
- outline W3C standards and their application to website development.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the client requirements, and content
- a text editor
- a range of browsers
- the internet for research and code validation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB417 Integrate social web technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to successfully develop and integrate social networking code into new and existing websites.

It applies to individuals working as web developers who apply a wide range of knowledge and skills across a range of general information and communications technology (ICT) environments and support small to medium enterprises (SMEs) that require broader, rather than more specialised, ICT support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the specifications and requirements	1.1 Evaluate different popular social networking websites 1.2 Discuss the benefits of social networking in websites 1.3 Discuss the negative aspects of social networking 1.4 Define goals, based on the client requirements, for successful social networking integration
2. Develop the code and documentation	2.1 Develop the guidelines for implementing social networking in a website 2.2 Develop the code to integrate a social networking website, into a pre-existing website 2.3 Use the pre-existing scripts and tools, to integrate a social networking website into a pre-existing website
3. Validate the integration	3.1 Validate social networking integration 3.2 Validate the performance of the social networking integration in different browsers, checking compatibility and display

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.3, 3.2	• Analyses and consolidates information and data, from a range of sources, against the defined criteria and requirements, and checks for accuracy and completeness
Writing	1.4, 2.1, 2.2	• Develops clear and well-organised material for a specific audience, using precise language to convey explicit information requirements and recommendations
Oral Communication	1.2, 1.3	• Determines and confirms client requirements using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals, to convey and clarify information and to confirm understanding
Interact with others	1.2, 1.3	• Selects and uses the appropriate conventions and protocols, when communicating with clients in a range of work contexts
Get the work done	1.1, 1.4, 2.1-2.3, 3.1, 3.2	• Takes responsibility for planning, sequencing and prioritising tasks, and own workload, for efficiency and effective outcomes • Makes routine decisions, and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems, to access information, search and enter, data and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB417 Integrate social web technologies	ICAWEB417A Integrate social web technologies	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB417 Integrate social web technologies

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse requirements for the integration of a social networking website into a pre-existing website
- determine the content management functionality, against current programming and security standards
- select an appropriate social networking platform
- develop and implement, social networking integration codes into an existing website
- validate frontend code markup, against the standards set by the World Wide Web Consortium (W3C).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the markup language and its associated standards
- summarise server-side language
- describe the advantages and disadvantages, of integrating social networking into web sites.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- client requirements
- a text editor
- a range of browsers
- the internet for research
- application programming interface (API) documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB418 Use development software and ICT tools to build a basic website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to build a basic website, consistent with the design, technical requirements and expectations, of a client's business, using current industry software and tools.

It applies to individuals working as web developers who use a wide range of knowledge and skills across a range of general information and communications technology (ICT) environments, and support small to medium enterprises (SMEs) that require broader, rather than more specialised, ICT support.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select and analyse the website structure and development tools	1.1 Analyse the business specification, and select the appropriate software 1.2 Identify the website's technical needs, and select the appropriate software tools 1.3 Identify the site's structure and navigation flow, and demonstrate an understanding of functionality 1.4 Review the design documentation, and integrate the design work with the site's structure and navigation, according to web development standards
2. Begin site construction	2.1 Take action to ensure user input during website construction 2.2 Validate the existing information and basic content, when incorporating data on the website 2.3 Apply consistent design specifications to all aspects of the website 2.4 Gather feedback from the user on web design, content, accessibility and structure, using the appropriate feedback mechanism
3. Complete and validate the website construction and content	3.1 Undertake an evaluation of the website, against the technical requirements and the design specification 3.2 Test each function, and, process of the website 3.3 Conduct navigation tests and hypertext markup language (HTML) compliance with website standards 3.4 Stress test the website to meet the design criteria and user load 3.5 Record testing results to ensure that the website meets user requirements 3.6 Obtain the sign-off and approval of the user

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 3.1	• Critically analyses complex documentation from a variety of sources, and consolidates information relating to specific criteria to determine requirements
Writing	2.1, 2.4, 3.5, 3.6	• Prepares and produces dynamic material for a specific audience, using clear and detailed language in order to convey explicit information, requirements and recommendations
Oral Communication	2.1, 2.4, 3.6	• Uses collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals, to convey and clarify information, and to confirm understanding
Navigate the world of work	1.4, 3.3	• Accepts responsibility and ownership for the task, and makes decisions on completion parameters, and the need for coordination with others • Takes personal responsibility for following explicit and implicit policies, procedures and standards
Interact with others	2.1, 2.4, 3.5, 3.6	• Selects and uses appropriate conventions and protocols, when communicating with clients in a range of work contexts • Uses a range of strategies, to establish a sense of connection, and to build rapport with clients and co-workers • Elicits and provides feedback to others
Get the work done	1.1-1.4, 2.2, 2.3, 3.1-3.4	• Takes responsibility for planning, sequencing, and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems, to access information, search and enter data, and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTWEB418 Use development software and ICT tools to build a basic website	ICAWEB418A Use development software and IT tools to build a basic website	Updated to meet Standards for Training Packages. Minor change to title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB418 Use development software and ICT tools to build a basic website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- conduct an assessment of, and document the specifications relating to, the client's website needs
- build a basic website according to client specifications
- validate the final web design against the client's requirements
- confirm and obtain client sign off.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline a basic knowledge of:
  - design principles
  - the issues around accessibility and equity principles, when building for diverse users
- identify and describe the software, and tools, that are used in website development
- outline the general principles of the standard generalised markup language (SGML), and associated documentation standards
- outline the principles of website design
- describe the technical attributes specific to the web
- describe and apply, the types of code used in the generation of web sites.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- basic website specifications and guidelines
- the website development software and tools
- an internet server
- organisational and industry standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB419 Develop guidelines for uploading information to a website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to support the effective operation of a website, by establishing content upload guidelines and procedures, in the context of site policies.

It applies to individuals who work in website maintenance roles who are required to ensure that a website remains operational.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop site policies	1.1 Develop and disseminate policies on acceptable usage, security, privacy and copyright issues, based on technical security and privacy requirements 1.2 Develop and disseminate, roles and responsibilities for updating and loading content, and removing redundant information 1.3 Document and disseminate information about the nature of content able to be updated and loaded 1.4 Establish the upload documentation, and disseminate the processes and procedures for the updating, loading or removal of content on the site 1.5 Implement automatic and routine, updating and archiving procedures
2. Establish the updating and loading procedures	2.1 Allocate, and make available to contributors, directory space to update and load new site content 2.2 Identify and make available for use, authoring guides and resources, based on cascading style sheets (CSS) and business style guides 2.3 Develop and make available, new content templates to be applied by authors for use based on CSS parameters 2.4 Allocate and monitor server permissions 2.5 Identify preferred file transfer protocol (FTP) client based on best fit with the technical environment, and make available for use 2.6 Customise the FTP client to meet requirements 2.7 Identify and develop authoring support tools, such as help files and links 2.8 Disseminate authoring support tools, such as help files and links, as necessary
3. Document the guidelines	3.1 Develop documentation for loading information, taking into consideration security and privacy 3.2 Document and make available, links to recommended support tools 3.3 Automate the details of recent updates and loading of information, and document on the site

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.2, 2.5	• Critically analyses complex documentation from a variety of sources, and consolidates information, relating to specific criteria to determine requirements
Writing	1.1-1.5, 2.3, 2.7, 3.1-3.3	• Develops procedural material for a specific audience, using clear and detailed language, in order to convey explicit information, requirements and recommendations
Navigate the world of work	1.1, 1.2, 1.5, 3.1	• Modifies or develops organisational policies and procedures, to comply with legislative requirements and organisation goals • Contributes to roles and responsibilities, of self and others
Interact with others	1.1-1.4, 2.1, 2.4, 2.8, 3.2	• Selects and uses, the appropriate conventions and protocols when communicating with clients and co-workers, in a range of work contexts • Uses a range of strategies to establish a sense of connection, and to build rapport with clients and co-workers • Cooperates with others, and contributes to work practices, where joint outcomes are expected, and deadlines are to be met • Identifies and explores, differences in a diverse range of people in the work context, and makes adjustments to communication in recognition of these differences
Get the work done	1.1-1.5, 2.1, 2.2, 2.4-2.7, 3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Contributes to the continuous improvement of current work practices, by applying basic principles of analytical and lateral thinking • Uses familiar digital technologies and systems to access information, search and enter data, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB419 Develop guidelines for uploading information to a website	ICAWEB419A Develop guidelines for uploading information to a website	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB419 Develop guidelines for uploading information to a website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a policy for uploading and removing website content that:
  - ensures that the policy reflects the strategic intent of the site, while maintaining site security and privacy standards
  - adheres to quality standards for the updating process and data
  - ensures that updates occur in a secure and convenient manner
  - develops updating and loading procedures for website content
  - reviews guidelines for uploading content to websites.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline copyright and intellectual property issues
- summarise the information architecture
- identify and describe, internet protocols
- outline the procedures for disseminating and documenting technical specifications
- clarify the website's architecture and business process design, and how e-business sites may fit into corporate strategy.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the servers
- an e-business website
- the file transfer protocol (FTP) software
- the organisational documentation, requirements and guidelines.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB420 Write content for web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to write concise, and clear, content for web pages on behalf of a client.

It applies to individuals who are proficient communicators in the web development field.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare to develop content for the site	1.1 Identify customer information needs, with reference to the audience, site functionality and client requirements 1.2 Confirm site purpose and functionality, with reference to client specification 1.3 Select content channels and format as part of client requirements 1.4 Obtain the templates and style guides 1.5 Identify the content and analyse with reference to audience needs, maintenance requirements, information architecture, and site design and functionality 1.6 Negotiate any alterations to site design, as required by the content and by client requirements
2. Write the site content	2.1 Create the content according to content and client requirements 2.2 Establish that the content is easily and conveniently, accessible and visible, and that information is clear, understandable, and logical 2.3 Edit the content with reference to audience needs, site functionality, content and client requirements
3. Upload the content	3.1 Log into the server site, using either the administrative or anonymous file transfer protocol in preparation for upload 3.2 Launch the transfer file transfer protocol (FTP) client, and navigate to the destination directory, either graphically or by using a command line interface 3.3 Store and order the files according to logical design and user needs, using an accepted file extension scheme 3.4 Demonstrate the operation in closed contention mode

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.6, 2.1-2.3, 3.1-3.3	• Reads and interprets specifications, computer program interface and other documentation, from a variety of sources, and consolidates information, to determine requirements
Writing	1.2, 1.6, 2.1, 2.3, 3.1-3.3	• Writes, edits and proofreads documents for internet use, to ensure clarity of meaning, and accuracy and consistency of information
Oral Communication	1.1, 1.2, 1.6	• Determines and confirms client requirements, using collaborative and inclusive techniques, including active listening and questioning, and reading of verbal and non-verbal signals, to convey and clarify information, and to confirm understanding
Get the work done	1.1, 1.3-1.5, 2.2, 2.3, 3.1-3.4	• Takes responsibility for planning, sequencing, and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions, and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB420 Write content for web pages	ICAWEB420A Write content for web pages	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB420 Write content for web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- write content for web pages that recognises cultural differences and diversity, in developing website content
- upload content for a website
- remove content on a website.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline content features, including clarity, ease of viewing and readability
- explain copyright and intellectual property legislation, relating to web page content
- summarise the document design, web design and usability
- discuss the functions and features of:
  - micro-content elements, such as headings, highlighted words and link text
  - style guides, such as cascading style sheets (CSS)
- explain the information architecture
- summarise the instructional design principles
- outline the obligations of merchants and service providers
- outline the organisational requirements relating to web page content and user diversity
- explain privacy requirements relating to web page content.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- copy edit resources
- culturally reviewed content
- style guides and templates
- the website specifications
- word-processing and web development software
- the organisational documentation, and industry requirements.
-

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB421 Ensure website content meets technical protocols and standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure content for a website is in accordance with customer specifications, and is compatible with the appropriate technical and infrastructure protocols.

It applies to individuals working in the web development area who are required to populate websites according to clear benchmarks.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm that content meets the required standards	1.1 Take action to ensure that text-based content meets client needs, and the required style standards 1.2 Confirm that the multimedia-based content meets the business design standards, or the overall look of the website 1.3 Check that the mix between multimedia and text-based content, provides the required level of interaction identified in the project brief 1.4 Test that the content conforms to client expectations and the technology
2. Confirm that the technology supports the content	2.1 Take action to ensure that the protocols required for multimedia content are available 2.2 Check and confirm, that the bandwidth required to support the content is available 2.3 Check and confirm, that the servers support the content and levels of interaction 2.4 Check and confirm, that the plug-ins required to support content are made available 2.5 Test and confirm, that compression techniques support delivery of content
3. Test the content	3.1 Test and confirm that content displays as intended and according to business requirements in target browsers 3.2 Test with beta users that content encourages interaction and content interaction performs as intended and record results 3.3 Test and confirm that plug-ins download with a minimum of steps, complication and time 3.4 Test that interactive tools are available and provide the expected results

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 1.4, 2.2, 3.1	• Identifies and analyses, online information and client specifications, to ensure that all business requirements are met
Writing	3.2	• Documents outcomes of tests using industry relevant terminology and recognised symbols
Oral Communication	1.1	• Clearly articulates requirements, using the language appropriate to the audience, and participates in a verbal exchange of ideas/solutions
Numeracy	3.3	• Uses basic mathematical formula to time technological processes
Navigate the world of work	1.1, 1.2, 3.1	• Takes personal responsibility for following explicit and implicit policies, procedures and specifications
Interact with others	1.1, 1.2, 3.2	• Elicits feedback and provides feedback to others, in order to improve work practices and processes • Selects and uses the appropriate conventions and protocols, when communicating with clients and co-workers in a range of work contexts
Get the work done	1.1, 1.4, 2.1-2.5, 3.1-3.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB421 Ensure website content meets technical protocols and standards	ICAWEB421A Ensure website content meets technical protocols and standards	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTWEB421 Ensure website content meets technical protocols and standards

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- carry out checks and tests, for a mix of content for a website, to ensure that it meets specifications and standards
- check and use, correct streaming and compression techniques
- manage the file transfer protocols (FTPs)
- test and confirm, content functionality and operability.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the applicability of copyright, privacy and intellectual property to website development
- explain common software compression algorithms, and associated technologies
- summarise the file transfer protocol (FTP) software protocols
- identify and summarise internet protocols
- explain the server access security principles and procedures
- outline the server operating systems
- summarise streaming technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work and, include access to:

- documents detailing organisational style guide or policies
- a personal computer, on which software installation may be performed
- compression and streaming software
- an internet connection
- a live network
- network components, hardware and software
- networked computers
- a server, and workstation hardware and software
- style guides, and the design brief
- technical documentation and installation manuals
- software currently used in industry
- vendor hardware and software components.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB422 Ensure website access and useability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to apply the principles of accessibility and equity in the context of website development.

It applies to individuals who are proficient communicators and who provide frontline technical support for ensuring that websites are accessible to end users.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Design a site user test	1.1 Establish the usability test methods 1.2 Identify critical business functions 1.3 Identify the full range of users 1.4 Confirm user expectations through market analysis, business intelligence and customer feedback 1.5 Establish the performance potential of the business, from the business requirements or other approved sources 1.6 Establish the performance measurement and success criteria, to measure actual performance against user expectations 1.7 Test the site when ready and record the outcomes
2. Conduct the user test	2.1 Document the process performance indicators and benchmarks, and disseminate them to a sample group of users 2.2 Assemble a full representative range of users and preferred technologies, to test site features and functions, based on the business specification 2.3 Ensure maximum user satisfaction, through ease of navigation controls and design 2.4 Ensure that user and legal, accessibility, privacy and equity requirements and expectations are met
3. Evaluate the user test	3.1 Collate site performance results and measure them against performance indicators and benchmarks, based on user expectations 3.2 Identify performance shortfalls, and ensure that acceptable performance solutions are developed according to business requirements 3.3 Establish an evaluation feedback mechanism and provide to users
4. Document the results	4.1 Identify solutions to the problems encountered during the testing phase 4.2 Discuss problems with developers and ensure that the solutions are continuously refined 4.3 Ensure that the proposed solutions meet business requirements

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ELEMENT	PERFORMANCE CRITERIA
	and user expectations 4.4 Document the final solutions in line with organisational guidelines, and distribute to the appropriate person

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 1.4, 1.5, 2.2, 3.1, 3.2, 4.3, 4.4	• Analyses and consolidates information and data from a range of sources, against the defined criteria and requirements, and checks for accuracy and completeness
Writing	1.5, 1.6, 1.7, 2.1, 3.1, 3.2, 3.3, 4.4	• Accurately records information and prepares correspondence, and documentation, using clear language, and organisational formats and protocols
Oral Communication	1.4, 1.5, 4.2, 4.3	• Uses listening and questioning skills to confirm understanding for requirements, participates in a verbal exchange of ideas/solutions, and uses appropriate, detailed and clear language, to address key personnel and website users
Numeracy	3.1, 3.2	• Performs mathematical calculations to analyse test and performance data, and statistics
Navigate the world of work	2.2, 2.4, 4.4	• Takes personal responsibility for following explicit and implicit policies, procedures and legislative requirements
Interact with others	2.1-2.3, 3.3, 4.4	• Selects and uses appropriate conventions and protocols, when communicating with clients and co-workers in a range of work contexts • Elicits feedback and provides feedback to others, while testing usability
Get the work done	1.1-1.7, 2.1-2.3, 3.1, 3.2, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Addresses less predictable problems, and initiates standard procedures in response to these problems, applying problem-solving processes in determining solutions • Uses familiar digital technologies and systems to access information, search and enter data, and code, present information and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB422 Ensure website access and useability	ICAWEB422A Ensure website access and useability	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB422 Ensure website access and useability

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research user needs
- design a valid usability test, and set benchmark metrics
- facilitate the test process and document the results
- document and propose solutions, to meet user needs and the current, and future, needs of the business.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the principles of accessibility and equity, in the context of website development
- outline the technical performance measurement of a typical web site
- describe common user testing principles and techniques
- outline the following important considerations for a website:
  - architecture
  - privacy
  - security
- describe workload metrics, and explain the implications for website design
- describe the website design as it applies to:
  - business process
  - customer and business liaison
  - electronic commerce modelling language
- outline the organisational policies and procedures relating to website functionality.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- analysis software
- the e-business website
- the organisational policy and procedures
- the requirements documentation
- a site server
- site server software
- web servers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB423 Ensure dynamic website security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to ensure, and maintain, the security of a dynamic commercial website.

It applies to individuals working as website developers responsible for security of dynamic websites, who are proficient communicators and can analyse technical data capably and with efficiency.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Undertake the risk assessment	1.1 Identify the functionality and features of the website, and confirm these with the client 1.2 Identify security threats, with reference to the functionality of the site and organisational security policy, legislation and standards 1.3 Complete a risk analysis to prioritise the security threats, and identify system vulnerabilities 1.4 Identify resource and budget constraints, and validate with the client as required 1.5 Source the appropriate products, security services and equipment, according to enterprise purchasing policies
2. Secure the operating systems	2.1 Identify operating system (OS) and cross-platform vulnerabilities 2.2 Make the appropriate scripting or configuration adjustments, with reference to the functionality of the site and the security policy 2.3 Identify and rectify weaknesses specific to the OS
3. Secure the site server	3.1 Configure the web server securely, with reference to the required functionality and the security policy 3.2 Review and analyse, server-side scripting with reference to the required functionality and the security policy 3.3 Install firewalls as required 3.4 Establish access control permissions to the server and database
4. Secure data transactions	4.1 Identify data transactions, with reference to the functionality and features of the website 4.2 Identify and apply, the channel protocols related to the requirements 4.3 Install and configure, the payment systems
5. Monitor and document the security framework	5.1 Develop a program of selective independent audits and penetration tests 5.2 Determine the performance benchmarks 5.3 Implement audit and test programs, and record, analyse and

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ELEMENT	PERFORMANCE CRITERIA
	report the results 5.4 Make security framework changes based on the test results 5.5 Develop the site-security plan, with reference to the security policy and requirements 5.6 Develop and distribute, related policy and procedures to the client

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3-1.5, 2.1, 2.3, 3.2, 4.1, 4.2, 5.4	• Reads and interprets plans, specifications, computer program interface, and other documentation from a variety of sources, and consolidates information to determine requirements
Writing	1.1, 1.3, 1.4, 2.2, 3.3, 4.3, 5.1, 5.2, 5.3, 5.5, 5.6	• Makes adjustments to software scripting, and creates procedural and related workplace documentation, for a specific audience, using clear and detailed language in order to convey explicit information
Oral Communication	1.1, 1.3, 1.4, 5.3, 5.6	• Uses listening and questioning skills to confirm understanding for technical, operational and business requirements, participates in a verbal exchange of ideas/solutions, and uses appropriate, detailed and clear language to address the client
Numeracy	1.4, 1.5, 4.3	• Undertakes numerical analyses during testing, and calculates, and evaluates system results and performance
Navigate the world of work	1.2, 1.5, 3.1, 3.2, 5.5	• Accepts responsibility and ownership of tasks, and makes decisions on completion parameters, and the need for coordination with others • Takes personal responsibility for following explicit and implicit policies, procedures and legislative requirements
Interact with others	1.1, 1.4, 5.6	• Selects and uses, the appropriate conventions and protocols, when communicating with clients and co-workers in a range of work contexts
Get the work done	1.1-1.5, 2.2, 2.3, 3.2-3.4, 4.3, 5.1-5.5	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others,

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		cognisant of data security and safety

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB423 Ensure dynamic website security	ICAWEB423A Ensure dynamic website security	Updated to meet Standards for Training Packages	Equivalent unit

Links

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Assessment Requirements for ICTWEB423 Ensure dynamic website security

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- determine the client security framework, and its requirements
- identify any potential security threats to a website, and document the risk and performance benchmarks
- develop and implement, strategies to secure a dynamic website.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the Australian Computer Society Code of Ethics
- explain a client business domain, its structure, function and organisation, including the organisational issues surrounding security
- identify and outline the legislation, regulations, and codes of practice pertinent to website information, including:
  - copyright
  - intellectual property
  - privacy
  - ethics
- outline current industry-accepted hardware and software products
- describe desktop applications and operating systems (OS), as they relate to website security
- explain the functions and features of:
  - automated intrusion detection software
  - authentication and access control
  - common stored account payment systems
  - cryptography
  - common gateway interface (CGI) scripts
  - generic secure protocols
  - stored-value payment systems
- explain the implications of network address translation (NAT), related to:
  - securing internal, internet protocol (IP) addresses
  - buffer overruns and stack smashing
  - operating system deficiencies
  - the protocol stack for internet communications
  - physical web server security, particularly remote
- describe the advantages, and disadvantages, of using a range of security features
- identify and describe, host security threats.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a dynamic website
- a security plan
- the user requirements
- all relevant legislation, standards and organisational requirements.

Assessors must satisfy NVR/AQTF assessor requirements.

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB424 Evaluate and select a web hosting service

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine a client's current and future internet service providers (ISPs) needs.

It applies to individuals working in information and communications technology (ICT) who take responsibility for comparing and evaluating internet service provider (ISP) services, and are technically adept and proficient communicators, with a broad knowledge of internet technologies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Select the ISP	1.1 Review comparable characteristics of a range of hosting services 1.2 Review the client usage, and ensure that email and mailing list services are flexible enough, to meet current and future business needs 1.3 Review the support service standards, to ensure that they meet the business needs 1.4 Ensure that the ISP hosting service has sufficient data capacity to cover partial outages 1.5 Determine the availability of security technologies 1.6 Determine the availability of scripting languages 1.7 Evaluate optional server applications for advanced web business functions 1.8 Confirm the client selection criteria, and select the ISP hosting service that best matches the criteria
2. Ensure guarantee of a permanent online presence	2.1 Establish that the web-hosting service has systems in place to monitor server performance and availability 2.2 Negotiate the escalation procedures and performance standards with the ISP 2.3 Establish that the security and backup procedures are articulated, and that they meet business needs
3. Ensure that the web host meets the technical requirements	3.1 Take action to ensure that the operating system supports the preferred business development software, applications, extensions and databases 3.2 Establish that the web-host servers support dynamic websites, using the preferred business technologies 3.3 Establish that the web host provides current, and future, disk space requirements 3.4 Establish that site-analysis reports are available, and are flexible enough to meet business needs 3.5 Establish that security systems and payment technologies, meet business and customer expectations, and requirements
4. Benchmark	4.1 Test the performance of the ISP during on and off peak times,

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ELEMENT	PERFORMANCE CRITERIA
performance and test it against specified criteria	and record the outcomes 4.2 Establish that email and mailing services have backup procedures in place, and are protected from damage, erasure or unwanted damage 4.3 Take action to ensure that the support services perform according to business needs

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.8, 2.1, 3.1	• Reads and interprets specifications, the computer program interface, and documentation from a variety of sources, and consolidates information to determine requirements
Writing	2.1-2.3, 3.5, 4.1	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately
Oral Communication	2.2, 2.3	• Uses listening and questioning skills to confirm understanding for all business requirements, participates in a verbal exchange of ideas/solutions, and uses appropriate, detailed and clear language to address client and ISP personnel
Numeracy	1.4	• Uses mathematical formulas to estimate data storage requirements
Interact with others	2.2, 2.3	• Selects and uses, the appropriate conventions and protocols, when communicating with clients and co-workers in a range of work contexts
Get the work done	1.1, 1.2, 1.4, 1.8, 2.1-2.3, 3.1-3.5, 4.1-4.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB424 Evaluate and select a web hosting service	ICAWEB424A Evaluate and select a web hosting service	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB424 Evaluate and select a web hosting service

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assess client needs for the current and future needs of the business
- select an internet service provider (ISP)
- evaluate the web hosting service by ensuring that:
  - the price meets the client's budgetary requirements
  - the security and technical requirements of the business are met
- comply with the client benchmarks, and test
- monitor the performance of the ISP during on and off peak times.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline different web hosting service provision options, and their scalability
- discuss internet security issues
- explain the operating systems used by ISPs
- summarise performance expectations from customers and end users
- outline server technologies
- summarise web hosting services, and performance benchmarks.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- hosting plans, prices and service agreements
- the current technology underpinning the ISP, and the services offered
- a business plan, outlining the future directions for the business.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB425 Apply structured query language to extract and manipulate data

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce structured query language (SQL) statements to work with server-side scripts, enabling web designers to interact with web server databases.

It applies to individuals who are employed as web designers responsible for creating server-side interaction with dynamic web pages, using SQL as a means of communicating with the database.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify SQL requirements from the specification documentation	1.1 Determine the information to be used from the database 1.2 Identify the tables that hold this information 1.3 Identify the primary keys in these tables 1.4 Identify the relationships between these tables, including foreign keys
2. Create a relational database	2.1 Create tables in a database, using SQL statements 2.2 Identify the primary and foreign keys for database table 2.3 Manipulate the data in a database, using SQL statements 2.4 Query the database, using SQL statements 2.5 Write SQL statements to retrieve information from the database
3. Test SQL results	3.1 Construct test data to test SQL statements 3.2 Determine the expected results in order to verify SQL statements 3.3 Verify the result of the constructed SQL statements, against the expected results

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.3, 3.3	• Analyses and consolidates information and data from a range of sources, against the defined criteria and requirements, and checks for accuracy and completeness
Writing	2.1, 2.3-2.5, 3.1, 3.2	• Uses clear and specialised technical syntax when creating codes and interrogating databases • Prepares and produces, diagrammatic models and associated documents, that that convey complex relationships between data
Get the work done	1.1, 1.4, 2.2-2.5, 3.2, 3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTWEB425 Apply structured query language to extract and manipulate data	ICAWEB425A Apply structured query language to extract and manipulate data	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB425 Apply structured query language to extract and manipulate data

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify structured query language (SQL) requirements
- create the databases and tables
- generate queries for one or more tables, to provide the required data
- add, modify and delete records from the database tables
- test and verify SQL statements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the features and application of the following aggregate functions:
  - MIN
  - MAX
  - SUM
  - AVG
  - COUNT
  - COUNT(*)
- explain the features and application of the following clause functions:
  - GROUP BY
  - HAVING
  - ORDER BY
  - dates and times
  - SQL data types
  - numbers
  - text
  - SQL syntax:
  - SELECT
  - FROM
  - WHERE
  - LIKE
  - DISTINCT
  - CREATE
  - ALTER TABLE
  - INSERT INTO
  - UPDATE
  - DELETE
  - DROP
- describe the principles of "combining and/or condition" in SQL statements and Boolean operators:
  - IN and BETWEEN conditional operators
  - mathematical operators
  - table joins (relationships).

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a development environment
- a database server.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB429 Create a markup language document to specification

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use a text editor to design, create and save web pages to a given specification, rather than using an authoring tool.

It applies to individuals working as web designers and developers who interpret client briefs, generate a framework for internet information, and are resourceful in their application of technology in using a markup language.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the specifications and requirements	1.1 Determine the uses and audience of the document 1.2 Determine the appropriate markup language, based on the document's uses and audience, and current industry best practice 1.3 Determine the document structure
2. Create the document structure	2.1 Create and assign the basic elements of the document, taking into account accessibility 2.2 Mark-up the sections of the document required to describe the structure
3. Incorporate the web page components	3.1 Identify the web page components 3.2 Evaluate suitable web page components 3.3 Include the required web page components
4. Validate the documents	4.1 Validate the markup language document, against the specifications and record the outcomes 4.2 Validate the markup language document in different browsers for compatibility, and record the outcomes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 4.1, 4.2	• Identifies, analyses and evaluates instructions, technical information and industry guidelines, to determine client needs and business requirements
Writing	1.3, 2.1, 2.2, 3.3, 4.1, 4.2	• Produces documentation for a specific audience, using clear and detailed language in order to convey explicit information • Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information
Navigate the world of work	1.2	• Takes personal responsibility for following explicit and implicit policies, procedures and industry best practice
Get the work done	1.1, 1.2, 3.1, 3.2, 4.1, 4.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload, for efficiency and effective outcomes • Makes routine decisions and implements standard procedures for routine tasks, using formal decision-making processes for more complex and non-routine situations • Addresses less predictable problems and initiates standard procedures in response to these problems, applying problem-solving processes in determining a solution • Uses familiar digital technologies and systems to access information, search and enter, data and code, present information, and communicate with others, cognisant of data security and safety

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB429 Create a markup language document to specification	ICAWEB429A Create a markup language document to specification	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB429 Create a markup language document to specification

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, create and save a document using a markup language, without using an automated code generation program
- use a text editor for generating the markup language code for use on common web browsers
- validate the markup document against the standards set by the World Wide Web Consortium (W3C).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- recognise and outline the use of markup languages including:
  - dynamic hypertext markup language (DHTML)
  - hypertext markup language (HTML)
  - standard generalised markup language (SGML)
  - virtual reality modelling language (VRML)
  - extensible hypertext markup language (XHTML)
  - extensible markup language (XML)
- identify and describe, standards applicable to a markup language
- summarise the range of available web browsers and their accessibility
- identify and describe, the issues of accessibility.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- an organisational style guide or policy
- all user requirements
- a text editor
- a range of browsers
- the internet, to validate the markup.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB501 Build a dynamic website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse and design websites to meet technical requirements.

It applies to individuals working as web developers who are responsible for the analysis, design, implementation, and testing of websites.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Define and analyse the technical requirements	1.1 Identify the business requirements and appropriate standards 1.2 Determine and document, the purpose, expectations and functionality of the website 1.3 Analyse the user-interface design requirements, including user needs, design principles and operating systems
2. Produce the software design specifications	2.1 Produce a hierarchy of the website showing navigation 2.2 Ensure that the content is logical and accessible to the user 2.3 Produce the prototype of the user interface 2.4 Determine and document, the architectural requirements 2.5 Design the data storage requirements
3. Develop the website to the specified design	3.1 Create the software components of the website 3.2 Test the components of the website 3.3 Integrate the components to produce the web application
4. Test the web application	4.1 Test the website against the requirements 4.2 Complete and document the design structure 4.3 Obtain client feedback and adjust web applications as appropriate

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.2, 2.4, 4.1	• Critically analyses complex documentation from a variety of sources, and consolidates information, relating to specific criteria to determine requirements
Writing	1.2, 2.1, 2.3-2.5, 3.1, 3.3, 4.2	• Prepares documentation expressing ideas and exploring complex issues, that is constructed logically, succinctly and accurately • Writes and edits computer code and technical data, to ensure syntax and accuracy
Navigate the world of work	1.1	• Takes full responsibility for following policies, procedures and standards
Interact with others	2.2, 4.3	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers, in a range of work contexts
Get the work done	1.1-1.3, 2.2-2.5, 3.1-3.3, 4.1, 4.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB501 Build a dynamic website	ICAWEB501A Build a dynamic website	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB501 Build a dynamic website

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse the technical requirements for a dynamic web site
- produce software design specifications
- create a website, using efficient and effective code to meet the technical requirements, and test and document a website against the requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise the principles of analysis and design
- outline programming control and design structures, and object-oriented programming
- explain web programming concepts, including:
  - authentication and web security
  - hypertext transfer protocol (HTTP)
  - session management
  - stateless programming.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a development environment
- a server
- a database server
- browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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ICTWEB502 Create dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to produce both server and client-side content.

It applies to individuals working as web developers who are responsible for creating dynamic pages to provide interaction between the user and the website. They use highly developed technical and analytical skills when developing the user-website interface.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the client and server-side dynamic content	1.1 Review the technical requirements 1.2 Identify the sections of the website, requiring client-side dynamic content 1.3 Identify the sections of the website, requiring server-side dynamic content 1.4 Select the appropriate languages and technology to meet the requirements
2. Create the dynamic content	2.1 Create pages using the appropriate languages 2.2 Ensure that the code conforms to current industry best practice and standards
3. Test the dynamic pages	3.1 Test the website in a variety of browsers 3.2 Ensure that the required dynamic content functions according to the specified requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.2	• Critically analyses documentation from a variety of sources and records, and consolidates information, to determine requirements
Writing	2.1	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits computer code, and technical data, to ensure the correct syntax and accuracy
Navigate the world of work	2.1	• Takes full responsibility for following policies, procedures and standards
Get the work done	1.2-1.4, 3.1, 3.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and to communicate effectively with others in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB502 Create dynamic web pages	ICAWEB502A Create dynamic web pages	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for ICTWEB502 Create dynamic web pages

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- produce dynamic web pages that include both client and server-side dynamic content
- create efficient and effective code to meet technical requirements
- test the website and code in a variety of web browsers.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain web-programming concepts, including:
  - authentication and web security
  - hypertext transfer protocol (HTTP)
  - session management
  - stateless programming
- identify and describe internet technologies including:
  - programming control structures
  - object-oriented programming
- recognise and outline various web browsers.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a development environment
- a server
- a database server
- browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB503 Create web-based programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop web applications.

It applies to individuals who work as web developers and have well-honed technical skills to take responsibility for implementing code required to create web applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the hypertext transfer protocol (HTTP) and its implications when developing web applications	1.1 Identify the hypertext transfer protocol (HTTP) required 1.2 Recognise the limitations HTTP has when developing web applications 1.3 Identify the advantages of HTTP in developing web applications
2. Implement session management	2.1 Create the code to handle session management 2.2 Create the code that retains the user's interaction with the website 2.3 Review and debug the code
3. Develop applications in a stateless environment	3.1 Develop web applications that keep track of data between browser requests 3.2 Document the web application, with particular reference to its management of statelessness

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 2.3	• Identifies and analyses the code for syntax and accuracy
Writing	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2	• Prepares documentation expressing ideas and exploring complex issues, that is constructed logically, succinctly and accurately • Writes and edits computer code and technical data, to ensure syntax and accuracy
Oral Communication	1.1, 1.2	• Clearly explains detailed information using the language, tone and pace appropriate to the audience
Get the work done	1.3, 2.1-2.3, 3.1, 3.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTWEB503 Create web-based programs	ICAWEB503A Create web-based programs	Updated to meet Standards for Training Packages. Minor edits to the performance criteria for clarity.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB503 Create web-based programs

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- recognise the hypertext transfer protocol (HTTP), and its limitations
- implement session management
- develop web applications that track user data
- document web applications.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of web analysis and design
- explain programming control structures and object-oriented programming
- summarise web programming concepts including:
  - authentication and web security
  - hypertext transfer protocol (HTTP)
  - session management
  - stateless programming.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a website development environment
- a server
- a database server
- web browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB504 Build a document using eXtensible markup language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design, and build, a valid extensible markup language (XML) document to suit a specified requirement.

It applies to individuals working in development roles in a variety of information technology areas who are technically proficient in the use of XML documents.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan the process	1.1 Review the specified requirements 1.2 Produce a plan to analyse the specified requirements 1.3 Plan the design, and build, of valid XML documentation, allowing for iterative development
2. Analyse the specified requirements	2.1 Determine and document the purpose, expectations and functionality of the XML document 2.2 Determine the hardware, software and tools needed to design the document 2.3 Determine the requirements for the document 2.4 Determine the appropriate design methodologies, including using the software engineering life cycle
3. Design and develop the document	3.1 Decide on document type definition (DTD), if required 3.2 Define the required entities, elements and their attributes 3.3 Produce the document, following the appropriate standards and declaring DTD, required entities, elements and their attributes, including associated graphics or sounds
4. Test the document	4.1 Test the document off-line against the specifications, and confirm the document's validity 4.2 Test, where appropriate, the document online against the specifications, and with a representative audience 4.3 Analyse the test results and confirm the document's validity

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 3.3, 4.1, 4.2, 4.3	• Critically analyses specifications and other documentation from a variety of sources, and consolidates information, to determine requirements
Writing	1.2, 1.3, 2.1, 2.2, 3.3	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits computer code and technical data, to ensure syntax and accuracy
Navigate the world of work	3.3	• Takes full responsibility for following policies, procedures and industry standards
Interact with others	4.2	• Selects, implements, and seeks to improve protocols governing communications to clients and co-workers, in a range of work contexts
Get the work done	1.1, 1.2, 2.1-2.4, 3.1-3.3, 4.1-4.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
ICTWEB504 Build a document using eXtensible markup language	ICAWEB504A Build a document using eXtensible markup language	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB504 Build a document using eXtensible markup language

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- review the specifications, and plan the design of an extensible markup language (XML) document
- determine specific requirements
- produce a valid XML document, following the appropriate standards
- test an XML document
- evaluate the test results.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain business process and information modelling
- describe markup language
- explain unified-modelling language
- describe the hardware and software implications for XML programming
- identify and summarise, the various standards that will impact on XML programming.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the client or business requirements
- an XML parser or suitable web browser
- a XML authoring tool.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB505 Develop complex web page layouts

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design and create a web page layout, to suit a range of devices and a variety of browsers, to industry standards.

It applies to individuals who work as web designers and web developers, have a highly developed understanding of design principles and apply technical skills proficiently, according to unique specifications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Build a web page according to the design prototype	1.1 Identify the main sections of the web page layout 1.2 Create the web page structure 1.3 Position web page elements to achieve the design specification
2. Ensure web page is validated and tested in major browsers	2.1 Validate the cascading style sheet (CSS) against industry standards 2.2 Correct browser incompatibilities, using the most robust techniques 2.3 Test the website in various browsers
3. Ensure website is accessible	3.1 Check that the website is accessible, to ensure that it can be viewed 3.2 Check website sections, to ensure accessibility 3.3 Check web page elements, to ensure accessibility

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 3.1, 3.2, 3.3	• Critically analyses specifications and other documentation from a variety of sources, and consolidates information, to determine requirements
Writing	1.2, 1.3	• Develops clear and well-organised technical material for specific audiences, using precise language to convey explicit information
Numeracy	1.3	• Takes measurements and performs calculations, for the web page layout
Navigate the world of work	2.1	• Takes full responsibility for following policies, procedures and industry standards
Get the work done	1.1, 1.2, 2.2, 2.3, 3.1, 3.2, 3.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB505 Develop complex web page layouts	ICAWEB505A Develop complex web page layouts	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB505 Develop complex web page layouts

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a complex website layout
- layout page elements to suit a variety of devices
- test web pages in a variety of browsers
- validate the pages against industry standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the principles of web site design
- describe and apply the following in web site design:
  - hypertext markup language (HTML) and extensible hypertext markup language (XHTML)
  - cascading style sheet (CSS)
  - hypertext transfer protocol (HTTP)
  - techniques to correct browser incompatibilities
- outline World Wide Web Consortium (W3C) standards, and explain their application to web design.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a computer
- an aesthetic presentation brief
- a variety of browsers
- the internet, to validate web pages against the W3C.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB506 Develop complex cascading style sheets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop complex cascading style sheets (CSS) that are attached to a markup language document.

It applies to individuals working as web designers and developers who are involved in the layout and appearance of web pages, and have a highly developed understanding of design principles, and software languages, and can apply protocols and standards proficiently.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine the requirements and develop CSS	1.1 Obtain user requirements for style 1.2 Develop CSS to match user requirements
2. Use advanced CSS techniques to create web pages	2.1 Style the elements of a web page, using advanced CSS techniques 2.2 Position the document elements, using advanced CSS 2.3 Apply the style sheets to multiple pages in a website
3. Ensure web page and CSS are validated and tested in all major browsers	3.1 Validate CSS against industry standards 3.2 Test the website in various browsers 3.3 Rectify browser differences to ensure that the website is accessible

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 2.3, 3.1	• Identifies and analyses technical, workplace, and industry information, to ensure that all the job requirements are met
Writing	1.1, 1.2, 2.1-2.3	• Develops clear and well-organised technical material for specific audiences, using technical language to convey explicit information
Oral Communication	1.1	• Uses listening and questioning techniques to clarify job specifications with the client
Numeracy	2.2	• Takes measurements and performs calculations for the web page layout
Navigate the world of work	3.1	• Takes full responsibility for following policies, procedures and industry standards
Get the work done	1.2, 2.1, 2.3, 3.2, 3.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB506 Develop complex cascading style sheets	ICAWEB506A Develop complex cascading style sheets	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB506 Develop complex cascading style sheets

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop a complex website, styled and formatted, using cascading style sheets (CSS), according to user requirements
- create a complex page layout using CSS
- test the web pages in a variety of browsers
- validate CSS against industry standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the principles of website design
- describe hypertext transfer protocol (HTTP) protocol and its application to CSS
- outline and apply, hypertext markup language (HTML) and extensible hypertext markup language (XHTML)
- outline CSS rules and how they affect document styling, and layout
- explain World Wide Web Consortium (W3C) standards, as they apply to website design
- identify and apply, techniques to correct browser incompatibilities.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a computer
- an aesthetic presentation brief
- HTML documents to have CSS applied to them
- the internet to validate the CSS against the W3C
- a variety of browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB507 Customise a complex ICT content management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create, and customise, an information and communications technology (ICT) content management system (CMS) powered website using an open source, to meet client requirements.

It applies to individuals working as web developers who have a detailed knowledge of markup languages and their associated standards, and are proficient in server-side language and security techniques. Individuals in this role also have high-level understanding of server functionality.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse the specifications and requirements	1.1 Determine the required functionality of the website, as per the client requirements 1.2 Determine the appropriate server-side language and hosting environment 1.3 Determine additional functionality that the CMS will not be able to handle 'out of the box' 1.4 Determine the functional requirements of the client's additional functionality 1.5 Determine any pre-existing restraints that need to be considered when developing the website solution
2. Develop customisation	2.1 Plan and outline, the requirements of the additional functionality 2.2 Create and develop plug-in, extension or new functionality to the CMS to meet client requirements
3. Create a CMS powered website	3.1 Install and configure, the chosen content management system 3.2 Install and integrate, the new CMS functionality
4. Validate and evaluate	4.1 Validate the final website markup against the current website standards 4.2 Validate CMS performance in different browsers, checking compatibility and core CMS functionality 4.3 Validate the developed additional functionality against the client requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 3.1, 3.2, 4.3	• Critically analyses complex specifications, computer program manuals, and other documentation from a variety of sources and, consolidates information, to determine requirements
Writing	2.1, 2.2, 3.1, 3.2	• Prepares documentation expressing ideas, explores complex issues and is constructed logically, succinctly and accurately • Writes and edits computer code, and technical data, to ensure syntax and accuracy
Oral Communication	1.1, 4.3	• Uses listening and questioning techniques to determine client requirements, and clearly articulates ideas and solutions, using specific and relevant language suitable to the audience
Navigate the world of work	4.1	• Takes full responsibility for following policies, procedures and industry standards
Get the work done	1.1-1.5, 2.1, 3.1, 3.2, 4.1-4.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies and applications, to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB507 Customise a complex ICT content management system	ICAWEB507A Customise a complex IT content management system	Updated to meet Standards for Training Packages. Minor edit to the title.	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB507 Customise a complex ICT content management system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- create a content management system (CMS) powered website, using an open source with additional custom functionality that is not available 'out of the box', that meets client requirements
- perform basic content manipulation tasks in commonly used browsers
- evaluate content management additional functionality against current programming and security standards
- customise functionality into a pre-existing core CMS, to fulfil client requirements by programming
- validate the front-end code markup against standards set by the World Wide Web Consortium (W3C).

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- analyse and describe, a range of content management systems and their respective functionality
- explain markup language and their associated standards
- outline server functionality in relation to the client and business requirements
- describe and apply, server-side language and security techniques
- explain the importance of web accessibility.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the client requirements, and content
- a text editor
- a range of browsers
- the internet for research, validation of code and programming documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB508 Develop website information architecture

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop information architecture for a complex website that meets current, and future, business requirements.

It applies to individuals working as highly skilled web developers and designers who are responsible for the navigation and hierarchy of a websites. They liaise with clients to adapt e-business into their corporate strategy, have high-level knowledge of technical languages and design principles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify content needs	1.1 Identify the strategic intent of the website from the business requirements and client expectations 1.2 Develop information requirements based on the website's intent, intended audiences, types of client interactions, and the long and short-term goals for the site 1.3 Identify the required information, and group into business schemes related to the business structure 1.4 Determine the content requirements for each process 1.5 Identify any security access requirements
2. Plan the content structure	2.1 Cluster and document the information in related topics 2.2 Develop a hierarchy and site map of the information 2.3 Check data to confirm the sequence of hierarchy 2.4 Ensure that labels are clear, consistent, coherent and relatively intuitive for the client to access
3. Develop the navigation system	3.1 Build a navigation system for the overall website, based on the business requirements 3.2 Ensure ease of navigation on the site, and provide different ways of searching, while providing feedback to the client 3.3 Ensure that navigation is accessible
4. Test and sign off	4.1 Construct the prototype of the information architecture design 4.2 Arrange for a subset of the client to test the prototype for usability, and to determine if the architecture meets client expectations 4.3 Ensure that the site content will format in the business and client technical environment 4.4 Adjust the architecture based on client feedback 4.5 Sign off the prototype, and confirm that current and future business requirements are met

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1, 2.3, 2.4, 3.1, 3.2, 4.4, 4.5	• Reads and interprets specifications, computer technical data, and other documentation from a variety of sources, and consolidates information to determine requirements
Writing	1.2, 2.1, 2.2, 2.4, 3.1, 3.3, 4.1, 4.2, 4.4, 4.5	• Develops clear and well-organised technical and online material, for specific audiences using the appropriate language to convey explicit information • Prepares correspondence using clear language, correct spelling and terminology, and accuracy of information
Oral Communication	1.1, 1.5, 3.2, 4.4	• Articulates clearly using specific and relevant language, suitable to the audience to convey requirements, and listening, and questioning techniques to confirm understanding
Interact with others	2.4, 3.3, 4.2	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers, in a range of work contexts
Get the work done	1.2, 1.3, 1.5, 2.3, 3.1, 4.1, 4.2, 4.3, 4.5	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies, and applications, to manage and manipulate data, and communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB508 Develop website information architecture	ICAWEB508A Develop website information architecture	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB508 Develop website information architecture

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the strategic business requirements for the website
- develop and design, the information architecture for a complex website
- develop a site map, outlining the navigation hierarchy of a complex website
- test the access path to all sections of the website, and obtain client approval.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe how e-business sites fit into a corporate strategy
- outline the importance of client and business liaison
- summarise the purpose and function of cascading style sheets (CSS)
- describe the use of hypertext markup language (HTML), extensible hypertext markup language (XHTML) and hypertext transfer protocol (HTTP), in web design
- outline the implications of technology connectivity and documentation of technical specifications
- summarise World Wide Web Consortium (W3C) standards
- explain the website architecture and business process design, and the linkages between processes
- outline the importance of website accessibility.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a web server
- the requirement specifications
- an integrated development environment (IDE), capable of creating web pages and server-side code
- current web development technology.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB509 Use site server tools for transaction management

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use site server tools to build, host, track, and monitor transactions on an e-business site.

It applies to individuals who work in a web environment and who are responsible for using site server tools to maintain the integrity of an e-business site, and have a detailed technical knowledge, and highly-developed analysis and interpretation skills.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Confirm and document the task requirements	1.1 Confirm task requirements, features and functionality of the site with the client, as required 1.2 Confirm the platform or software related to the business systems 1.3 Confirm the integration requirements of site with client 1.4 Confirm standards relevant to the task and the site functionality 1.5 Document the current and proposed configuration 1.6 Document and validate client task requirements, performance criteria and scope of work with the client 1.7 Confirm the available resources and budget with the client
2. Select the tools	2.1 Identify relevant site server tools with reference to requirements 2.2 Review and evaluate the tools with reference to the task requirements and the required site functionality 2.3 Load and configure the server tools according to the vendor guidelines and client requirements 2.4 Use server tools to test the equipment
3. Use the tools	3.1 Use server tools to maintain or update relevant functionality 3.2 Coordinate and implement the procedures 3.3 Use server tools, according to the vendor guidelines to achieve the relevant task requirements
4. Review the server tools and task requirements	4.1 Monitor, analyse and evaluate the organisational procedures 4.2 Review the site server configuration related to client task requirements and make adjustments to the configuration 4.3 Review the server tools, according to the client task requirements 4.4 Use site-analysis software to validate server outcomes 4.5 Create and use reports, and other documentation, for the purposes of record keeping and auditing

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 2.1, 2.2, 2.3, 3.2, 3.3, 4.1, 4.2, 4.3	• Critically analyses complex documentation from a variety of sources, and consolidates information, relating to specific criteria to determine the requirements
Writing	1.1, 1.3, 1.5, 1.6, 1.7, 3.1, 4.2, 4.5	• Develops clear and well-organised reports and related workplace documentation, and correspondence, for specific audiences, using the appropriate language to convey explicit information
Oral Communication	1.1, 1.3, 1.6, 1.7	• Articulates complex information clearly, using specific and relevant language suitable to the audience, to convey requirements, and uses listening and questioning techniques to confirm understanding
Numeracy	1.7	• Accommodates business requirements by interpreting budgetary constraints, and undertakes mathematical calculations with reference to the available resources
Navigate the world of work	1.4, 3.2, 4.1	• Takes full responsibility for following policies, procedures, legislative requirements and industry standards • Modifies or develops organisational policies and procedures, to comply with industry standards and organisation goals
Interact with others	1.1, 1.3, 1.6, 1.7, 3.2, 4.3	• Selects, implements and seeks to improve protocols governing communications, to clients and co-workers, in a range of work contexts • Collaborates with others, sharing information in order to build strong relationships
Get the work done	1.1-1.4, 1.6, 2.1-2.4, 3.1-3.3, 4.1, 4.2, 4.4	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews, and changes them, to meet new demands and priorities • Applies systematic and analytical decision-making processes, for complex and non-routine situations • Uses and investigates new digital technologies and applications, to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title **current version**	**Code and title** **previous version**	**Comments**	**Equivalence status**
ICTWEB509 Use site server tools for transaction management	ICAWEB509A Use site server tools for transaction management	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB509 Use site server tools for transaction management

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- confirm and document the clients requirements
- select and use the appropriate website server tools, to maintain the expected business performance and technical standards, in an e-business environment
- build, maintain and monitor the transactions on an e-business site
- review the procedures and task requirements, for an e-business site.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- select and describe, the devices required for a business site
- summarise functions and features of tools relevant to:
- firewalls and proxy servers as required
- hypertext transfer protocol (HTTP) servers
- search engines
- outline the security measures required for the site
- explain the tools and products required for site construction
- summarise the role of protocols related to the features and to functionality
- explain the site-building considerations, in relation to a new versus an established business.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the server hardware
- site server tools currently used in industry
- an existing e-business website
- the business expectations brief
- the appropriate standards and current legislation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB510 Analyse information and assign meta tags

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse material and assign meta tags to ensure the accurate and consistent retrieval of information by users.

It applies to individuals in a range of information and communications technology (ICT) areas that use various techniques and software to create, update and enhance meta tags according to industry guidelines and client specifications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify the requirements for meta tags	1.1 Identify the scope and uses of material from the previous and current business, and the stakeholder requirements process 1.2 Determine the appropriate type and structure of meta tags, taking into account identified client needs, requirements and expectations 1.3 Identify and incorporate, new or contemporary client requirements, and expectations
2. Analyse the material	2.1 Use the analysis and the description tools, standards, precedents and techniques that are appropriate, given the nature of the material 2.2 Ensure that the analysis of the subject content of the material reflects expected client usage requirements 2.3 Clearly distinguish significant information from minor information 2.4 Ensure that the concepts derived from the analysis of the material are appropriate to the business requirements, and the intended use
3. Create meta tags	3.1 Develop meta tags using appropriate software 3.2 Ensure that meta tags represent the concepts appropriately, depending on the overall purpose, and intended use, of the material 3.3 Ensure that the meta tags conform to general conventions and to the business rules 3.4 Develop the reference structure of descriptors, where required, to display relationships to assist clients 3.5 Enhance the meta tags to meet identified client needs
4. Test and monitor meta tagging practices and procedures	4.1 Test meta tagging of material and make changes, if necessary 4.2 Regularly review meta tagging practices and procedures, to ensure that client needs are being met 4.3 Regularly review industry developments in meta tagging and take the appropriate action to improve practices 4.4 Check meta tags regularly for internal consistency and compliance with the established structure, rules and authorities

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.4, 3.2, 3.5, 4.2-4.4	• Reads and interprets plans, specifications, computer program data, and other documentation from a variety of sources, and consolidates information to determine requirements
Writing	3.1, 3.4, 3.5, 4.1, 4.3	• Prepares documentation expressing ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Navigate the world of work	3.3, 4.2, 4.3, 4.4	• Takes full responsibility for following policies, procedures, industry standards and legislative requirements, and identifies the organisational implications of new regulations
Get the work done	1.1-1.3, 2.1-2.4, 3.2-3.4, 4.1, 4.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews, and changes them to meet new demands and priorities • Applies systematic and analytical decision-making processes for complex and non-routine situations • Uses and investigates new digital technologies and applications, to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB510 Analyse information and assign meta tags	ICAWEB510A Analyse information and assign meta-tags	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB510 Analyse information and assign meta tags

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and identify the meta tag requirements
- use software to create and test meta tags
- update meta tags in line with the client needs and/or industry developments.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the business conventions and rules for applying meta tags
- summarise the client business domain
- outline data modelling
- explain database management system (DBMS) fundamentals
- summarise the decision support systems
- summarise document indexing and search engines
- outline the functions and features of databases
- summarise metadata standards, including Dublin Core and simple hypertext markup language (HTML) ontology extensions
- describe how reference structure of descriptors can assist clients.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- business and client information and materials
- the metadata software
- the project-related documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB511 Implement quality assurance process for websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and conduct planned and systematic actions required to provide confidence that websites conform to relevant standards and fulfil client expectations.

It applies to individuals in the web field of work that use highly-developed communication, analysis and technical skills to determine intelligent strategies for ongoing website improvement.

Check the Implementation Guide Companion Volume for details about licensing, legislative or certification requirements.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish standards	1.1 Identify appropriate regulatory, accessibility, industry and organisational compliance standards 1.2 Develop, quantify, document and disseminate measurable performance standards, from those standards, for all documents 1.3 Establish centralised, distributed or combined quality assurance methodology 1.4 Determine specification from which website was developed 1.5 Establish guidelines for controlling, updating and loading new content on to website
2. Apply standards and track performance	2.1 Apply all processes as integral part of website development process 2.2 Validate site, updates and new content against performance standards, using wide variety of browsers and tools 2.3 Document and disseminate results 2.4 Provide feedback to web authors, users and administrators on routine and regular basis
3. Develop and apply continuous improvement process	3.1 Provide performance standards feedback to developers, maintainers and administrators 3.2 Identify below-average or unacceptable performance standards and apply appropriate measures to improve performance 3.3 Provide channels for interaction, feedback and suggestions from site users, administrators, developers and maintainers 3.4 Respond appropriately to interaction, feedback and suggestions 3.5 Develop procedures to identify whether feedback and suggestions are applied and acted on 3.6 Conduct regular benchmark reviews based on improved performance and disseminate revised benchmarks
4. Document quality assurance practices	4.1 Document quality assurance procedures and processes 4.2 Document quality assurance results 4.3 Document and control changes to procedures, processes and results

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 2.1, 2.2, 3.2, 3.6	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.2, 1.3, 1.5, 2.3, 2.4, 3.1, 3.3-3.6, 4.1, 4.2, 4.3	• Develops procedural material for a specific audience using clear and detailed language to convey explicit information, requirements and recommendations • Accurately records information and prepares correspondence and documentation using clear language and organisational formats and protocols
Oral Communication	2.3, 2.4, 3.1, 3.2, 3.3, 3.6	• Articulates requirements and strategies via an open line of communication using language appropriate to audience and environment
Numeracy	1.2	• Analyses data to quantify response times and time lines when determining performance standards
Navigate the world of work	1.1, 1.2, 1.5, 2.1, 3.2, 4.1, 4.3	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies the organisational implications of new legislation or regulation • Modifies or develops organisational policies and procedures to comply with legislative requirements and organisational goals • Seeks to improve policies and procedures to better meet organisational goals
Interact with others	1.2, 2.3, 2.4, 3.1, 3.3, 3.4, 3.6	• Selects, implements and seeks to improve protocols governing communications to clients and co-workers in a range of work contexts • Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships • Elicits feedback and provides feedback to others
Get the work done	1.3-1.5, 2.2, 2.3, 3.4-3.6	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules, and reviews and changes them to meet new demands and priorities • Applies systematic and analytical decision-making processes for complex and non-routine situations

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		• Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation and formal analytical thinking

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB511 Implement quality assurance process for websites	ICAWEB511A Implement quality assurance process for websites	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB511 Implement quality assurance process for websites

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify, establish and implement appropriate quality assurance standards for the website
- evaluate existing processes and procedures
- develop and implement a continuous improvement process
- develop quantitative standards and performance benchmarks
- document quality assurance standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise business process design, and customer and business liaison
- outline copyright and intellectual property relating to websites
- explain provisions of privacy legislation relating to websites
- clarify website accessibility and equity legislation
- outline website architecture and website security
- explain workload metrics and technical performance measurement.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- web servers
- an e-business website
- analysis software
- automatic testing software
- documentation for appropriate regulatory, industry compliance and accessibility standards.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTWEB512 Administer business websites and servers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead a strategic review, prepare a security plan and prepare for future growth of business websites and servers.

It applies to individuals working as multimedia developers, web strategists or project managers who provide technical advice, guidance and leadership when resolving specified problems. In some cases, they may have responsibility for the work output of others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Maintain business website and contents	1.1 Establish personnel policy and procedures for managing access and changes to aspects of business website 1.2 Design and start training program for teaching staff how to use procedures and policies as well as making changes to business website 1.3 Evaluate and test site-analysis software on non-live server to verify features and functions are safe for use on live server 1.4 Generate site summary reports in line with organisational quality management program or guidelines 1.5 Review reports found to have generated security flaws 1.6 Check links for functionality and ongoing relevance 1.7 Modify web pages according to changing business requirements and analysis of site summary report 1.8 Maintain and debug database information according to site and information requirements
2. Maintain business security of website	2.1 Establish security response procedure to control information placed on business website by developers, designers and end users 2.2 Develop security plan 2.3 Test site security according to organisational requirements of security plan 2.4 Maintain site security using information from security vendors and technical media outlets
3. Monitor business website performance	3.1 Select server analysis tools with reference to organisational requirements and range of functionalities requiring monitoring 3.2 Determine business website load metrics and performance indicators in line with organisational requirements 3.3 Measure business website server performance with server analysis tools 3.4 Identify and document business options for performance improvement 3.5 Submit website server performance reports to client
4. Undertake capacity	4.1 Determine future peak volumes by measuring page usage and

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ELEMENT	PERFORMANCE CRITERIA
planning	volume access 4.2 Develop upgrade program to deal with increasing load and performance issues 4.3 Set performance benchmarks to take into consideration possible future scenarios for each load metric 4.4 Determine options for upgrade path for equipment needs based on research and business website performance growth forecasting

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2-1.8, 2.3, 2.4, 3.1, 3.2, 3.4, 4.4	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.1, 1.2, 1.4, 1.7, 1.8, 2.1, 2.2, 3.4, 3.5, 4.2, 4.3	• Accurately records and completes organisational documents and correspondence using clear language and correct spelling, grammar and terminology • Writes, edits and proofreads documents to ensure clarity of meaning, and accuracy and consistency of information
Oral Communication	1.2, 3.5	• Facilitates training programs for staff by conveying requirements using clear and specific language • Uses collaborative and inclusive techniques including active listening and questioning and reading of verbal and non-verbal signals to convey and clarify information and to confirm understanding
Numeracy	3.2, 3.3, 4.1, 4.3	• Performs mathematical calculations to check, analyse and confirm results of system tests
Navigate the world of work	1.1, 1.4, 2.1, 3.1	• Takes full responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation • Contributes to roles and responsibilities of self and others • Modifies or develops organisational policies and procedures to comply with legislative requirements and organisational goals • Seeks to improve policies and procedures to better meet organisational goals
Interact with others	3.5	• Implements strategies for a diverse range of colleagues and clients to build rapport and foster strong relationships
Get the work done	1.1-1.3, 1.6-1.8, 2.1-2.4, 3.1-3.3, 4.2-4.4	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules and reviews and changes them to meet new demands and priorities • Applies systematic and analytical decision-making

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		processes for complex and non-routine situations • Investigates new and innovative ideas as a means to continuously improve work practices and processes through consultation and formal analytical thinking

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB512 Administer business websites and servers	ICAWEB512A Administer business websites and servers	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB512 Administer business websites and servers

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- evaluate and test site-analysis software
- test and maintain website security
- design and implement a staff website maintenance training program
- monitor website performance
- develop an upgrade program to cater for business website performance growth
- prepare documentation for:
  - security plan
  - training program
  - website server performance reports
- upgrade program.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the notion of bottlenecks in data flow and methods for correction
- outline electronic commerce modelling language (ECML)
- summarise queuing systems
- explain standard generalised markup language (SGML) and associated standards
- summarise user request classes
- outline the principles of website architecture
- summarise website security issues
- explain workload metrics.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- site servers and web servers where tasks may be performed
- a business website
- site server and analysis software currently used in industry
- requirements and business planning documentation.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTWEB515 Implement and use web services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to support web services for building distributed applications.

It applies to individuals working as software developers who have specialised skills in the consumption of web services, related communications protocols and the associated extensible markup language (XML) technologies, used in web services.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Use XML to provide information	1.1 Create XML data structures from various data sources 1.2 Manipulate XML data structures, using a common application programming interface (API) 1.3 Use namespaces to scope elements from multiple XML documents 1.4 Validate XML data structures, using a schema 1.5 Map, and transform, an XML document from one schema to another
2. Use WSDL to promote a web service	2.1 Understand the purpose of the web service description language (WSDL) 2.2 Identify the three main elements that comprise WSDL 2.3 Build a WSDL file 2.4 Provide web access to a WSDL file, via a uniform resource locator (URL)
3. Use UDDI to locate and retrieve information about a public web service	3.1 Identify the purpose of universal description, discovery and integration (UDDI) 3.2 Understand the differences between public, extra-enterprise and intra-enterprise, UDDI registry deployments 3.3 Locate, and retrieve information, about a public web service using UDDI 3.4 Identify the relationship between WSDL and UDDI
4. Access the web services using SOAP	4.1 Identify the purpose of simple object access protocol (SOAP) 4.2 Determine the relationship between UDDI and SOAP 4.3 Identify the basic structure and processing of a SOAP message 4.4 Retrieve an XML document from a public web service, using SOAP
5. Implement a web service	5.1 Outline a basic web service architecture 5.2 Implement, test and publish a web service 5.3 Incorporate and test a web service into an application

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3-1.5, 2.2, 3.1, 3.3, 3.4, 4.1-4.3	• Reads and interprets specifications, computer program data, and other documentation, from a variety of sources, and consolidates information to determine requirements
Writing	1.1-1.5, 2.3, 2.4, 4.3, 4.4, 5.1, 5.2	• Develops clear and well-organised specifications, and related workplace documentation, for specific audiences using the appropriate language to convey explicit information
Navigate the world of work	2.1, 3.2, 4.2	• Ensures that knowledge of computing technologies is kept up to date in order to provide, and carry out, activities
Get the work done	1.2, 2.1, 2.4, 3.3, 4.4, 5.1-5.3	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others, and taking into account capabilities, efficiencies and effectiveness • Makes critical decisions quickly and intuitively in complex situations, taking into consideration a range of variables, including the outcomes of previous decisions • Applies systematic and analytical decision-making processes, for complex and non-routine situations • Uses and investigates new digital technologies and applications, to manage and manipulate data, and to communicate effectively with others, in a secure and stable digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB515 Implement and use web services	ICAWEB515A Implement and use web services	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB515 Implement and use web services

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- transform data from relational or other native data sources, into an extensible markup language (XML)
- validate an XML document, using a predefined schema
- provide access to the business functionality via a web service description language (WSDL) file
- locate a public web service business function, and include it in a website, using universal description, discovery and integration (UDDI), and a simple object access protocol (SOAP)
- implement a web service according to the business requirements, specifications, and industry standards.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise integrated development environments
- summarise web development technologies
- outline the web service architecture
- describe the importance of XML language and data structures.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- the web service business requirement specifications
- industry standards published by the World Wide Web Consortium (W3C)
- platform-specific documentation and help files, describing the syntax and use of proprietary technologies
- a simulated development environment, incorporating the following elements:
  - a relational database server
  - the integrated development environment (IDE), including related frameworks, APIs and associated proprietary classes, required to implement web services and their enabling technologies
  - a web server
  - web browsers
  - XML editors
  - XPath testing utilities.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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ICTWEB516 Research and apply emerging web technology trends

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to keep up-to-date and apply emerging web technologies.

It applies to individuals who have an understanding of internet technology, are highly skilled technicians, and have high-level knowledge of the principles of analysis and design.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Web

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify emerging web technology trends and their uses	1.1 Review new developments in web technology 1.2 Identify the appropriate web technology to meet the needs of the web application
2. Implement new web technology trends in a portfolio	2.1 Create the code to apply the web technology 2.2 Test the web application in a variety of browsers, and rectify any problems that arise

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	• Critically analyses complex information from a variety of sources, and consolidates information, relating to specific criteria to determine the requirements
Writing	2.1	• Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Get the work done	1.2, 2.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others while taking into account capabilities, efficiencies and effectiveness • Investigates new and innovative ideas as a means to improve work practices and processes • Uses and investigates new digital technologies and applications, to manage and manipulate data, and to communicate effectively with others in a secure, and stable, digital environment

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTWEB516 Research and apply emerging web technology trends	ICAWEB516A Research and apply emerging web technology trends	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICTWEB516 Research and apply emerging web technology trends

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- research, investigate, and apply emerging web technology trends to a web application.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of the internet and the technologies that underpin its existence
- summarise the key principles of analysis and design
- outline programming control structures and object-oriented programming
- explain web programming concepts, including:
  - the hypertext transfer protocol (HTTP)
  - stateless programming
  - session management
  - authentication and web security
  - client-side programming
- explain the latest web technology trends, and their application, to a client
- evaluate a web application, using trends in web technology
- identify the sources of information regarding new and emerging, trends and technologies.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the website technologies field of work, and include access to:

- a development environment
- a server
- a database server
- the internet
- browsers.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website: - http://www.ibsa.org.au/companion_volumes

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BSBCMM101 Apply basic communication skills

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop basic communication skills in the workplace in particular gathering, conveying and receiving information together with completing assigned written information.

It applies to individuals working under direct supervision who are developing basic skills and knowledge of workplace communication in preparation for working in a broad range of settings

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Communication – Interpersonal Communication

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Identify workplace communication procedures	1.1 Identify organisational communication requirements and workplace procedures with assistance from appropriate people 1.2 Identify appropriate lines of communication with supervisors and colleagues 1.3 Seek advice on the communication method/equipment most appropriate for the task
2 Communicate in the workplace	2.1 Use effective questioning, and active listening and speaking skills to gather and convey information 2.2 Use appropriate non-verbal behaviour at all times 2.3 Encourage, acknowledge and act upon constructive feedback
3 Draft written information	3.1 Identify relevant procedures and formats for written information 3.2 Draft and present assigned written information for approval, ensuring it is written clearly, concisely and within designated timeframes 3.3 Ensure written information meets required standards of style, format and detail 3.4 Seek assistance and/or feedback to aid communication skills development

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1	• Reviews textual information to identify communication requirements and organisational procedures
Writing	3.2, 3.3	• Drafts simple texts using appropriate grammar, spelling and punctuation in accordance with organisational standards • Proofreads own texts for accuracy and compliance with organisational requirements
Oral Communication	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.2, 3.4	• Asks questions and listens to gain information or confirm understanding • Listens and follows instructions
Navigate the world of work	1.1, 1.2, 3.1, 3.3, 3.4	• Follows organisational policies and procedures and practices relevant to own role • Develops skills required to carry out own role by seeking and acting on feedback
Interact with others	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.4	• Follows instructions regarding what and how to communicate • Seeks to cooperate with others to achieve results in immediate work context
Get the work done	1.3, 2.3, 3.1, 3.2, 3.3	• Follows clearly defined instructions, seeking assistance when necessary • Uses digital technologies following instructions to enter and retrieve data

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBCMM101 Apply basic communication skills	BSBCMM101A Apply basic communication skills	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBCMM101 Apply basic communication skills

Modification History

Release	Comments
Release 1	This version first released with Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- gather information about procedures, methods and equipment requirements for workplace communication, with the assistance of others
- use appropriate verbal and non-verbal skills to seek and convey information in face-to-face situations
- draft routine written documents within designated timeframes and check that the documents meet organisational requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline organisational policies, plans and procedures related to the organisation's standards or protocols for workplace communication
- describe different communication styles.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals using interpersonal communication skills in the workplace and include access to:

- office equipment
- business resources
- workplace policies and procedures relating to communication
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBCRT401 Articulate, present and debate ideas

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0

Application

This unit describes the skills and knowledge required to articulate, present and debate ideas in a work or broader life context using creative techniques in order to provoke response, reaction and critical discussion.

This unit applies to individuals who contribute and present ideas that may be complex in nature and may relate to new products, services, processes or creative works using a degree of risk taking and storytelling.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and Innovation – Creative Thinking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Analyse ideas for communication to others	1.1 Distil key themes, messages and positions to aid in clarity of thought and presentation 1.2 Reflect on different ways of communicating ideas for different purposes and to different people 1.3 Identify the enabling skills and attributes of individuals who can effectively participate in discussions about ideas
2. Provoke response and reaction	2.1 Explore and use different techniques to engage, fascinate and involve others in the process of communication and exchange 2.2 Explore the ways that storytelling can be used to communicate ideas 2.3 Create innovative approaches to different communication challenges 2.4 Be prepared to take risks in the way ideas are presented 2.5 Identify specific ways to provoke and encourage response in particular individuals or groups
3. Debate and discuss ideas	3.1 Present and argue substantiated positions on ideas 3.2 Be open to critical analysis of own ideas and to the ideas of others 3.3 Identify and participate in conversations that challenge and explore different concepts and approaches and generate new ideas 3.4 Respond to questions about ideas with confidence and relevant information 3.5 Reflect on and appraise the views of others, and use to refine ideas and to embrace new ideas

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.5	• Considers opinions of others to improve and enhance own learning
Oral Communication	2.1, 3.1, 3.2, 3.3, 3.4	• Articulates ideas and requirements clearly and creatively using techniques appropriate to audience and environment • Participates in a verbal exchange of ideas and elicits the view and opinions of others by listening and questioning • Uses a range of persuasive responses and makes comparisons which show an understanding of topics and concepts
Interact with others	2.1, 2.2, 2.3	• Demonstrates sophisticated control over oral, visual and/or written formats, drawing on a range of communication practices to achieve goals
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 3.3, 3.5	• Recognises opportunities to develop and apply new ideas and select ideas for implementation • Considers key themes and ideas to be explored and identifies ways to respond to and use diverse perspectives • Uses features and functions of digital tools and technologies to store and present information

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBCRT401 Articulate, present and debate ideas	BSBCRT401A Articulate, present and debate ideas	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for BSBCRT401 Articulate, present and debate ideas

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0

Performance Evidence

Evidence of the ability to:

- present ideas and information to a unfamiliar audience and environment that provoke interest and response
- reflect on and appraise the views of others
- participate actively and confidently in critical debate and discussion of ideas while responding to new and different communication situations
- investigate and evaluate creative and different ways of expressing and communicating ideas while making an opportunity pitch.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain different ways in which individuals receive and respond to ideas and information, and what influences their response
- identify the enabling skills and attributes of people needed to effectively discuss ideas
- describe the nature and role of risk taking in the presentation and debate of ideas
- explain the role of storytelling in communicating ideas and key storytelling techniques
- describe common techniques to tailor comments to particular audiences.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the creativity and innovation – critical thinking field of work and include access to opportunities to present, discuss and debate ideas with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBCRT501 Originate and develop concepts

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to originate and develop concepts for products, programs, processes or services to an operational level.

It applies to individuals who develop concepts for any business or community activity or process, such as marketing and advertising campaigns, staff development programs, information technology and communication systems, radio and television programs, entertainment events, films, exhibitions and digital media products. Individuals operate with a high degree of autonomy, but collaborate with others to generate ideas and refine concepts to the point where they can be implemented.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and Innovation – Creative Thinking

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Evaluate and explore needs and opportunities	1.1 Research and evaluate existing information that informs new concept development 1.2 Where appropriate, identify and use gaps in current range of products, programs, processes or services as the catalyst for generating new ideas or concepts 1.3 Expand the potential of new ideas through exploration of opportunities beyond the obvious 1.4 Identify factors that could have an impact on ideas or concepts to be developed, including potential for commercialisation 1.5 Determine whether other players are filling identified gaps or investigating similar opportunities 1.6 Develop preliminary ideas on innovative and different ways to address needs and opportunities 1.7 In consultation with relevant stakeholders, agree on broad parameters for developing ideas and concepts to meet market requirements
2 Develop a range of creative approaches	2.1 Use a range of creative thinking techniques to generate innovative and creative concepts to address identified needs 2.2 Challenge, test and experiment with different concepts and ideas as part of a collaborative process 2.3 Evaluate concepts in terms of their suitability for the target audience or purpose, their feasibility and their commercial potential 2.4 Take account of social, ethical and environmental issues as concepts and ideas are generated and discussed 2.5 Identify resources required to achieve desired creative and innovative outcomes 2.6 Evaluate the effectiveness of different strategies for achieving desired outcomes 2.7 Select concepts or approaches that achieve required outcomes in an innovative and feasible way 2.8 Present proposed concepts or approaches in an appropriate format

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ELEMENT	PERFORMANCE CRITERIA
3 Refine concepts	3.1 Ensure concept development process is open to ongoing refinement and testing 3.2 Seek input and feedback on concepts from relevant stakeholders 3.3 Seek specialist advice on creative and technical aspects of proposals as required 3.4 Compare concepts with best practice examples of similar products, programs, processes or services 3.5 Use a range of creative and practical criteria to determine the advantages and disadvantages of different concepts 3.6 Evaluate constraints on the realisation of concepts or ideas 3.7 Refine proposals based on analysis and feedback
4 Develop concepts to an operational level	4.1 Use refined concepts as the basis for developing detailed implementation specifications 4.2 Present specifications to relevant parties for approval, funding or endorsement 4.3 Reflect on methodology used to generate concepts and ideas and note ways of improving this in the future

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1, 3.7, 4.3	• Reflects and evaluates methods used to develop concepts and seeks ways to improve • Actively elicits the views and opinions of others to develop and refine ideas
Reading	1.1-1.5, 2.3, 2.6, 3.4, 3.5, 3.6, 3.7, 4.1	• Interprets and evaluates a range of complex information and considers how to develop and adopt ideas to deliver products or services at an operational level
Writing	1.1-1.4, 1.6, 2.4-2.6, 2.8, 3.2-3.7, 4.1, 4.2	• Documents findings and ideas using language and structure to suit the purpose • Develops documents designed to gain feedback from others • Prepares proposals and plans for relevant stakeholders incorporating appropriate vocabulary and grammatical structures
Oral Communication	1.7, 2.2, 2.4, 3.2, 3.3, 4.2	• Expresses thoughtful and challenging opinions using engaging language and non-verbal features • Elicits views and information from others using a range of active listening and questioning techniques
Interact with others	1.7, 2.2, 2.4, 2.8, 3.2, 3.3, 4.2	• Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction and influencing direction • Selects and uses appropriate conventions and protocols when communicating with internal and external stakeholders to seek or share information
Get the work done	1.1- 1.5, 2.1-2.7 , 3.1, 3.4-3.6, 4.2, 4.3	• Plans and implements complex activities with multiple considerations, monitors implementation, and manages relevant feedback • Uses systematic, analytical processes in complex, non-routine situations to gather required information, identify and evaluate possible concepts, and select the most appropriate concept for development • Develops new and innovative ideas through exploration, analysis and critical thinking • Monitors outcomes, considering results from a range of perspectives and identifying key concepts and principles that may be adaptable to future situations

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBCRT501 Originate and develop concepts	BSBCRT501A Originate and develop concepts	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBCRT501 Originate and develop concepts

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- generate concepts and ideas that provide innovative solutions to identified issues
- evaluate and test concepts and ideas
- present ideas and information to others and reflect on responses
- develop at least two concepts, substantiated and supported with sufficient information to allow implementation to occur.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must :

- describe the broad context in which concepts are being developed
- outline cultural, social and environmental issues and impacts to be considered in developing new concepts
- identify issues and requirements to commercialise the concept
- outline practical and operational issues to be considered in a specific work or community context
- describe the range of broad practical and operational issues that determine whether a concept can be implemented
- identify techniques for generating creative ideas and solutions, and for translating these ideas into workable concepts.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the creativity and innovation – critical thinking field of work and include access to:

- a full range of background information required to evaluate the operational factors that will affect the implementation of concepts
- opportunities to collaborate with others throughout the concept development process.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBEBU401 Review and maintain a website

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to undertake data analysis, review website content, and update and maintain a website.

It applies to individuals who have knowledge of the relationship between a website and the core functions of an organisation. They also have working knowledge and skills to perform basic updates to website content. They may provide administrative support within an organisation or be other individuals who have been delegated this responsibility.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Information and Communications Technology – E-Business

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Review website content and use	1.1 Monitor and analyse customer and user feedback in accordance with organisational timelines 1.2 Analyse automatically collected website data and identify trends 1.3 Make recommendations on changes to website and its content in response to feedback and data analysis, and approve changes scheduled for implementation 1.4 Review cost implications of the recommended changes to determine their viability
2 Update website	2.1 Replace superseded and inaccurate information with current information and add additional material in accordance with organisational requirements 2.2 Follow protocols for ensuring the accuracy and authenticity of information 2.3 Remove services no longer available or required and add new ones in accordance with organisational requirements 2.4 Check offline information against that posted on the website and rectify any discrepancies in accordance with organisational timelines 2.5 Follow security procedures for updating the website
3 Carry out non-technical site maintenance	3.1 Analyse user feedback to confirm website faults are not user issues 3.2 Rectify faults and make improvements to website in response to user feedback approved by the organisation 3.3 Add new web pages and/or active links and remove redundant pages and links in accordance with organisational requirements 3.4 Make website changes in response to changes in marketing strategy, in accordance with organisational requirements and consideration of cost benefits

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.1, 2.3-2.5, 3.1-3.4	• Recognises text within job specifications and work processes related to the outcomes of the job
Writing	1.3, 1.4, 2.1-2.5, 3.2-3.4	• Records key information related to the outcomes of the job
Oral Communication	1.3, 3.2	• Makes recommendations on changes to website content • Analyses and responds to user feedback
Numeracy	1.4	• Uses basic numeracy skills to determine cost implications and viability
Navigate the world of work	1.1-1.4, 2.1-2.5, 3.1-3.4	• Accepts responsibility and ownership for the task and makes decisions on completion parameters and the need to coordinate with others • Takes personal responsibility for following security procedures and meeting organisational requirements
Interact with others	1.3, 3.2	• Selects and uses appropriate conventions and protocols when communicating with clients and users in a range of work contexts
Get the work done	1.1-1.4, 2.1-2.5, 3.1-3.4	• Takes responsibility for planning, sequencing tasks for efficient and effective organisational outcomes • Uses problem solving processes to identify and analyse technical issues • Contributes to continuous improvement of website by applying basic principles of analytical thinking • Understands the purposes, specific functions and key features of common digital systems and tools and operates them effectively to complete tasks in accordance with security requirements

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBEBU401 Review and maintain a website	BSBEBU401A Review and maintain a website	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBEBU401 Review and maintain a website

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse data to make recommendations about changes to website
- update web pages according to organisational requirements
- analyse data, identify and resolve faults, errors and/or complaints on website.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and review knowledge of key provisions of relevant legislation, regulations, and standards and codes of practice that may affect aspects of business operations
- explain basic principles of website design and maintenance
- outline online security issues.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the information and communications technology – e-business field of work. This includes access to:
networked computers

- computers and office equipment
- industry software packages
- documentation relating to analysis and strategies/policies for implementation.

Assessors must satisfy NVR/AQTF assessor requirements.

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BSBEBU501 Investigate and design e-business solutions

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to evaluate e-business models and strategies, as well as incorporate the results of these evaluations into the design of an e-business solution.

It applies to individuals who possess skills and knowledge in a specialist business area, as well as knowledge of software and other technologies. They apply these skills and knowledge in the evaluation, selection and implementation of new strategies for business, which incorporate e-business solutions. They may be responsible for overseeing these tasks along with technical or other knowledge experts.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Information and Communications Technology – E-Business

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Investigate e-business opportunities	1.1 Undertake a competitive analysis to determine the likely impact new capabilities will have on industry sectors and competitors 1.2 Complete and assess value chain analysis to identify processes and relationships that may benefit from the adoption of e-business solutions 1.3 Identify threats and opportunities to e-business implementation and evaluate potential contributions to the business 1.4 Conduct resource analysis to identify cost and revenue implications in developing opportunities 1.5 Identify and evaluate legal and ethical issues relating to e-business opportunities
2 Evaluate e-business models	2.1 Identify and analyse business-to-business, business-to-consumer, intra-organisational e-business applications and e-business models 2.2 Rank compatible e-business models in terms of their strengths and weaknesses, considering resourcing, technical and security requirements of each 2.3 Assess cost implications of implementation of e-business models 2.4 Determine an e-business model most appropriate in relation to business plan
3 Design an e-business	3.1 Formulate purpose, objectives and values for the e-business 3.2 Identify target market, and value chain structure in accordance with chosen e-business model 3.3 Identify and obtain technical needs and expertise required to implement e-business model 3.4 Investigate and develop plan to address culture change issues to manage transition to an e-business
4 Implement an e-business strategy	4.1 Develop policies and guidelines to support customers, supply chain and staff to ensure successful implementation 4.2 Monitor performance of business goals and adjust policies and procedures to respond to changing needs of customers, staff and

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ELEMENT	PERFORMANCE CRITERIA
	supply chain 4.3 Review e-business systems and models, seeking feedback from users and personnel responsible for e-business implementation 4.4 Incorporate evaluation results and feedback to improve future e-business strategies

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.4, 3.2-3.4, 4.1-4.4	• Interprets a range of textual information to evaluate opportunities, possible exemplars and technical considerations
Writing	1.1-1.5, 2.1-2.4, 3.1-3.4, 4.1-4.4	• Takes personal notes and develops workplace documentation that clarifies complex ideas using language and structure to suit context and audience
Oral Communication	3.3, 4.3	• Articulates information clearly using language and tone appropriate to audience and environment • Uses active listening and questioning techniques to receive feedback and confirm understanding
Numeracy	1.4, 2.2, 2.3	• Analyses numerical information to determine resources required for job
Navigate the world of work	1.1-1.5, 2.1-2.4, 3.1-3.4, 4.1-4.4	• Develops and reviews organisational procedures to achieve broader workplace goals • Monitors adherence to organisational procedures and legislative requirements
Interact with others	3.3, 4.3	• Selects and uses appropriate conventions and protocols when communicating with others in a range of work contexts
Get the work done	1.5, 2.1-2.4, 3.1-3.4, 4.1-4.4	• Takes responsibility for developing and implementing organisational processes that comply with legislative requirements and achieve required outcomes • Systematically gathers and analyses all relevant information and evaluates options to solve problems or make decisions • Considers the effectiveness of a solution in terms of how well it met stated goals, and seeks to make improvements • Investigates new and innovative ideas as a means to continuously improve work practices and processes • Uses digital technologies and systems safely, legally and ethically to access, store and share information

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBEBU501 Investigate and design e-business solutions	BSBEBU501A Investigate and design e-business solutions	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBEBU501 Investigate and design e-business solutions

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and evaluate e-business opportunities involving new business models and not simply electronic versions of existing businesses
- provide supporting evidence for choice of e-business solution
- implement, monitor and evaluate an e-business solution.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the role of a value chain analysis when assessing potential e-business solutions
- identify relevant legislation, regulations, standards and codes of practice that may affect the implementation of the e-business solution
- list key features of a range of e-business models
- outline the policies and guidelines relating to the implementation of the e-business solution.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the information and communications technology – e-business field of work and include access to:

- office equipment and materials
- documentation relating to analysis and implementation
- relevant legislation, regulations and codes of practice.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBINN601 Lead and manage organisational change

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes skills and knowledge required to determine strategic change requirements and opportunities; and to develop, implement and evaluate change management strategies.

It applies to managers with responsibilities that extend across the organisation or across significant parts of a large organisation. They may have a dedicated role in human resources management, human resources development, or work in a strategic policy or planning area.

The unit takes a structured approach to change management and applies to people with considerable work experience and organisational knowledge.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and innovation – innovation

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Identify change requirements and opportunities	1.1 Identify strategic change needs through an analysis of organisational objectives 1.2 Review existing policies and practices against strategic objectives to identify where changes are required 1.3 Monitor the external environment to identify events or trends that impact on the achievement of organisational objectives 1.4 Identify major operational change requirements due to performance gaps, business opportunities or threats, or management decisions 1.5 Review and prioritise change requirements or opportunities with relevant managers 1.6 Consult stakeholders, specialists and experts to assist in the identification of major change requirements and opportunities
2 Develop change management strategy	2.1 Undertake cost-benefit analysis for high priority change requirements and opportunities 2.2 Undertake risk analysis and apply problem solving and innovation skills to identify barriers to change and agree and record mitigation strategies 2.3 Develop change management project plan 2.4 Obtain approvals from relevant authorities to confirm the change management process 2.5 Assign resources to the project and agree reporting protocols with relevant managers
3 Implement change management strategy	3.1 Develop communication or education plan, in consultation with relevant groups and individuals, to promote the benefits of the change to the organisation and to minimise loss 3.2 Arrange and manage activities to deliver the communication or education plans to relevant groups and individuals 3.3 Consult with relevant groups and individuals for input into the change process 3.4 Identify and respond to barriers to the change according to risk management plans 3.5 Action interventions and activities set out in project plan

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ELEMENT	PERFORMANCE CRITERIA
	according to project timetable 3.6 Activate strategies for embedding the change 3.7 Conduct regular evaluation and review and modify project plan where appropriate to achieve change program objectives

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2	• Interprets detailed information that may deal with complex ideas related to issues both within and outside the workplace context
Writing	2.1, 2.2, 2.3, 2.4, 3.1	• Uses clear and precise language to develop information about objectives, requirements, activities and recommendations • Develops complex plans and strategies in appropriate format for the audience and purpose
Oral Communication	1.6, 2.2, 2.4, 2.5, 3.3	• Discusses and seeks information using appropriate structure and language for the particular audience • Uses questioning and active listening to clarify or confirm understanding
Numeracy	2.1, 2.3, 2.3	• Interprets, analyses and presents numeric/financial information in complex documents
Navigate the world of work	1.1-1.6, 2.4, 2.5, 3.1, 3.2	• Takes a lead role in the development of organisational strategic goals and associated roles and responsibilities
Interact with others	1.5, 1.6, 2.4, 2.5, 3.1-3.3	• Uses a variety of communication tools and strategies to build and maintain effective working relationships • Uses inclusive and collaborative techniques to seek feedback, negotiate and consult with a range of stakeholders
Get the work done	1.1-1.5, 2.1-2.5, 3.1, 3.2, 3.4-3.7	• Plans, organises and implements activities required to achieve strategic priorities and outcomes, including consulting with others and sequencing events to minimise uncertainty for staff • Uses problem-solving skills to identify and analyse issues or barriers, and develop responses • Develops new and innovative ideas through exploration and lateral thinking

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBINN601 Lead and manage organisational change	BSBINN601B Manage organisational change	Updated to meet Standards for Training Packages Edits to clarify intent of Performance Criteria Title change	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBINN601 Lead and manage organisational change

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and interpret information about the organisation's internal and external environment and consult with stakeholders to identify requirements and opportunities for changes that support organisational objectives
- prioritise opportunities for changes with input from managers
- develop a change management project plan for the priority changes incorporating resource requirements, risk management and timelines
- develop strategies to communicate or educate the changes and embed them
- obtain approvals and agree reporting protocols with relevant managers and implement the plan including addressing barriers to change
- review and evaluate the change management project plan and modify as needed to achieve objectives.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the change management process or cycle and strategies for communicating and embedding change
- explain how organisational behaviour and the external environment can impact on change strategies
- describe the components of a change management project plan
- list potential barriers to change and explain possible strategies to address barriers.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the creativity and innovation and include access to:

- workplace documentation and resources
- office equipment, materials and software packages
- case studies or, where available, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBINN801 Lead innovative thinking and practice

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to generate, lead and sustain innovative organisational thinking and practice.

It applies to individuals who initiate and lead innovation in any industry or community context. Each organisation's thinking and practice will be different depending on its core business, purpose, size, complexity and broader operating context.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and Innovation – Innovation

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Generate innovative thinking and creativity	1.1 Research and use a range of techniques and tools to generate new ideas and thinking 1.2 Research and analyse trends shaping organisation's current and future thinking and practice 1.3 Introduce and promote creative thinking techniques to foster personal and team innovation 1.4 Evaluate overall context for individual and collective innovative thinking and creativity 1.5 Research and analyse specific conditions for innovation and issues that impact on individual and collective innovative thinking and creativity 1.6 Research and review innovation drivers and enablers
2 Lead innovative practices	2.1 Develop personal leadership style to model positive innovative thinking and practice 2.2 Review, challenge and refine own style and practice in relation to modelling and supporting innovation 2.3 Assess and determine the requirements to promote sustainable innovative activity for the operational context and people involved 2.4 Devise and implement most appropriate means to promote knowledge transfer 2.5 Identify, evaluate and manage risks associated with innovation within an organisation
3 Generate and support a culture of innovation	3.1 Introduce and promote innovative practices, processes, products or services appropriate to audience and organisational requirements 3.2 Establish ways to capture, communicate and share innovative ideas and practices 3.3 Initiate and foster communication, consultation and team development approaches that support innovation 3.4 Identify, assess and provide adequate resources for innovation to occur 3.5 Develop and apply strategies to foster a workplace culture capable of encouraging innovation

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Establish mechanisms at system and process level that can support innovation
4 Sustain innovative thinking and practice	4.1 Develop strategies to make innovation an integral part of organisational activity 4.2 Develop and monitor processes to ensure ongoing awareness of individual and collective contributions to innovative thinking and practice 4.3 Analyse potential barriers and risks to innovation and devise strategies to respond 4.4 Analyse and reflect on innovation performance as a basis for developing strategies for improvement

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	2.1, 2.2, 4.4	• Evaluates and reflects on personal effectiveness to develop strategies to enhance own performance
Reading	1.1, 1.2, 1.5, 1.6	• Identifies, analyses, interprets and evaluates visual and textual information from a range of sources to identify innovation strategies, practices and trends
Writing	1.1, 1.2, 1.5, 1.6, 3.2	• Uses clear and precise language to document research findings for reference purposes • Develops complex plans, strategies and systems to integrate innovation into the organisation using appropriate formats for the audience and purpose
Oral Communication	1.3, 3.2, 3.3, 3.5	• Discusses, presents and seeks information using appropriate structure and language for the particular audience • Uses questioning and active listening to encourage discussion and to clarify or confirm understanding
Numeracy	1.1, 1.2, 1.5, 1.6, 3.2	• Interprets, analyses and presents numeric/financial information in complex documents
Navigate the world of work	2.1, 2.2, 2.3, 2.5, 3.1, 3.5, 4.1	• Understands how own role meshes with others and contributes to broader work goals • Leads in the development of strategies to integrate innovative practices into the organisation
Interact with others	1.3, 3.2, 3.3, 3.5	• Uses a variety of relevant communication tools and strategies to build and maintain effective working relationships • Uses inclusive and collaborative techniques to communicate, negotiate and consult effectively with a range of stakeholders • Actively seeks the perspectives of others as part of work role
Get the work done	1.1,1.2, 1.3-1.6, 2.3-2.5, 3.2-3.6, 4.1-4.4	• Plans, develops, implements and monitors practical strategies to introduce and support innovation in the workplace • Develops new and innovative ideas through exploration, evaluation, analysis and critical thinking • Uses formal analytical and lateral thinking techniques to identify issues, generate and evaluate possible solutions, and select most appropriate option

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBINN801 Lead innovative thinking and practice	BSBINN801A Lead innovative thinking and practice	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBINN801 Lead innovative thinking and practice

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use various techniques and tools to stimulate creative or innovative thinking
- research, review and critically analyse trends in thinking and emerging practices as they relate to an organisation's current thinking and practices
- develop own capacity to lead innovative thinking and practice in an organisational context
- complete a workplace project or case study to demonstrate a comprehensive understanding and application of key concepts, current theories and processes for introducing, communicating, promoting, supporting and sustaining innovative thinking and practices in an organisational context.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- compare and contrast current and past theories and thinking about innovation
- explain how theory and thinking on innovation and creativity can contribute to applied practice
- discuss the impact of leadership style on innovation in organisations, including how specific approaches may encourage or inhibit innovation
- discuss the relevance of organisational and industry context on innovation
- analyse the internal and external conditions or factors that impact on organisational innovation
- outline strategies for identifying, assessing and managing risks associated with innovation
- provide examples of innovation drivers in an organisation
- provide examples of innovation enablers in an organisation
- list and describe mechanisms at system or process level that can support innovative practices
- discuss typical challenges and barriers to innovation within an organisation and ways of overcoming these challenges and barriers.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the creativity and innovation field of work and include access to:

- workplace documentation and resources
- office equipment and materials
- case studies or, where available, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBIPR301 Comply with organisational requirements for protection and use of intellectual property

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to assist with the protection and lawful use of an organisation's intellectual property and to avoid intellectual property infringement. It focuses on supporting the maintenance of an organisation's policies and procedures for the protection of intellectual property and avoidance of intellectual property infringement.

It applies to individuals who operate in a broad range of work roles and contexts and whose role may include assisting the organisation to comply with intellectual property requirements for the protection and use of intellectual property.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Intellectual Property

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify organisational expectations for complying with intellectual property requirements	1.1 Identify the various types of existing and potential intellectual property within the organisation 1.2 Identify and access the organisation's intellectual property policies, procedures and information 1.3 Identify own role in protecting the organisation's intellectual property, using intellectual property and avoiding intellectual property infringement 1.4 Provide information and advice to relevant internal and external stakeholders about how the organisation's intellectual property policies and procedures operate, within limits of job role
2. Support policies and procedures for the protection and use of intellectual property	2.1 Assist with the development and/or implementation of policies and procedures for the protection and use of the organisation's intellectual property according to the type of protection required 2.2 Assist with the development and/or implementation of policies and procedures to prevent infringement of others' intellectual property 2.3 Assist in the maintenance of intellectual property policies and procedures 2.4 Contribute to the identification of potential problems and opportunities for improvement in the operation of the intellectual property policies and procedures and make recommendations to appropriate personnel for action
3. Contribute to recommendations about non-compliance issues with intellectual property requirements	3.1 Contribute to the identification of any potential non-compliance or intellectual property infringement issues, either internally or externally 3.2 Contribute to recommendations to appropriate personnel about actions to overcome non-compliance issues 3.3 Alert appropriate personnel to areas of potential intellectual property infringement or risk

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.1-2.4, 3.1-3.3	• Interprets and comprehends organisational texts related to intellectual property requirements
Writing	1.4, 2.1-2.4, 3.1-3.3	• Records information in accordance with requirements • Develops texts using language appropriate to audience needs
Oral Communication	1.4, 2.4, 3.1-3.3	• Provides information using language and terminology appropriate to audience • Obtains information from others by listening and questioning
Navigate the world of work	1.3, 1.4, 2.1, 2.2	• Understands and takes responsibility for adhering to legal and regulatory compliance with respect to own work
Interact with others	1.4, 2.1-2.4, 3.1-3.3	• Follows accepted communication practices when seeking or providing advice about intellectual property • Collaborates with others to achieve joint outcomes
Get the work done	1.1, 1.2, 1.4, 2-1-2.4, 3.1-3.3	• Plans and implements a range of tasks directly related to own role, seeking assistance where required • Uses problem solving skills to identify and respond to intellectual property compliance issues

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBIPR301 Comply with organisational requirements for protection and use of intellectual property	BSBIPR301A Comply with organisational requirements for protection and use of intellectual property	Updated to meet Standards for Training Packages	Equivalent unit

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Links

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Assessment Requirements for BSBIPR301 Comply with organisational requirements for protection and use of intellectual property

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the different types of intellectual property within the organisation
- identify, correctly use and/or update an organisation's intellectual property policies and procedures
- identify the potential of non-compliance issues within an organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe different types of intellectual property and the key characteristics of each
- outline the relevant organisational policies and procedures in relation to intellectual property
- describe the range of intellectual property residing with the organisation
- describe the relevant legislative requirements as they apply to the job role.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the regulation, licensing and risk – intellectual property field of work and include access to:

- relevant legislation, regulations, standards and codes
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBLDR803 Develop and cultivate collaborative partnerships and relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish collaborative partnerships and relationships with business and industry stakeholders.

This unit covers communicating to influence others, cultivating new and existing partnerships, establishing positive collaborative relationships, leading the establishment of a partnership program and establishing reporting mechanisms.

It applies to people who use cognitive and creative skills to review, critically analyse, consolidate and synthesise knowledge, in order to generate ideas and provide solutions to complex problems. They use communication skills to demonstrate their understanding of theoretical concepts and to transfer knowledge and ideas to others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership - Leadership

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Communicate to influence relevant individuals and stakeholders	1.1 Generate trust, confidence and support from relevant stakeholders by demonstrating a high standard of personal performance and conduct 1.2 Implement communication strategies to represent the organisation positively to media, local community and stakeholders 1.3 Make decisions in consultation with relevant stakeholders and relevant individuals where appropriate 1.4 Use a range of influencing strategies to increase commitment from staff and stakeholders to achieve organisational requirements and to contribute to desired culture 1.5 Undertake selected community and/or professional engagements that project a positive image of the organisation to the broader community and stakeholders
2. Cultivate new and existing partnerships with stakeholders	2.1 Establish outcomes to be achieved from the partnership 2.2 Analyse and apply models for effective consultation and collaboration within partnerships 2.3 Cultivate collaborative communities and partnerships through application of a range of communication solutions 2.4 Forge relationships, collaborative communities or partnerships between organisations
3. Establish positive collaborative relationships	3.1 Establish processes that contribute to the creation and maintenance of a positive culture that embraces collaboration 3.2 Establish processes to resolve conflict in a fair, equitable and collaborative manner 3.3 Organise and allocate work activities in a cost effective and equitable manner with clear, quantifiable and agreed performance standards 3.4 Encourage staff to undertake activities that develop their personal competence and performance 3.5 Empower individuals to develop their own ways of working within agreed boundaries of competence, cultural, diversity and organisational and legal requirements 3.6 Establish indicators and feedback processes that can be used to evaluate the health of the work environment

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ELEMENT	PERFORMANCE CRITERIA
4. Lead establishment of a partnership program	4.1 Identify and address relevant organisational policies and procedures in partnership plans 4.2 Identify and incorporate relevant legal requirements into planning 4.3 Form partnerships using collaborative and consultative processes involving public and/or private sector enterprises 4.4 Plan and allocate resource requirements to accomplish a partnership program 4.5 Establish relevant organisational policies and procedures relating to partnerships
5. Establish reporting mechanisms for partnership program	5.1 Establish reporting systems for reporting results against planned partnership outcomes 5.2 Implement reporting systems to map progress against partnership outcomes

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.2	• Sources, evaluates and critiques ideas and information from a range of complex texts
Writing	2.1, 3.1, 3.2, 3.6, 4.4, 4.5, 5.1	• Develops texts dealing with complex concepts using specialised and detailed language to convey strategy context and intent and requirements in accordance organisational requirements
Oral Communication	2.3, 3.4, 4.3	• Leads discussions using language and non-verbal features to suit the audience • Uses active listening and questioning to seek the views and opinions of others
Numeracy	3.3	• Selects and uses familiar mathematical techniques to determine costs and benefits associated with strategic resource decisions
Navigate the world of work	3.5, 4.1, 4.2	• Takes a lead role in the development of organisational goals, roles and responsibilities • Leads adherence to organisational policies, procedures and legal requirements and considers own role in terms of its contribution to broader goals of the organisation
Interact with others	1.1, 1.4, 2.3, 2.4, 3.2, 3.4, 4.3	• Plays a lead role in building effective collaboration and trust, demonstrating high level conflict resolution skills and ability to engage and motivate others • Identifies and uses a variety of appropriate conventions and protocols when communicating with colleagues and external stakeholders
Get the work done	1.2, 1.3, 1.5, 2.1, 3.1, 3.3, 3.6, 4.4, 5.2	• Develops flexible plans for complex, high impact activities with strategic implications that involve a diverse range of stakeholders with potentially competing demands • Monitors agreed outcomes and required indicators

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBLDR803 Develop and cultivate collaborative partnerships and relationships	Not applicable	New unit	No equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBLDR803 Develop and cultivate collaborative partnerships and relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- demonstrate and model skills and knowledge to foster partnerships, conduct stakeholder consultation and use strategic and personally enhancing communication skills
- develop collaborative approaches to enhance individual, team and organisational outcomes
- initiate and implement partnerships in line with relevant regulatory, employment and organisational requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the legislative and regulatory context of the organisation
- outline the organisation's mission, purpose, values, objectives and strategies
- explain techniques that cultivate collaborative relationships and partnerships
- describe data collection methods
- explain the external context including social, political, economic and technological developments
- explain emotional intelligence and its relationship to individual and team effectiveness
- explain organisational transformation and the management of the stages of change.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant legislation, regulations, standards and codes
- workplace documents including business strategic plans, policies and procedures
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBMGT608 Manage innovation and continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to sustain and develop an environment in which continuous improvement, innovation and learning are promoted and rewarded.

It applies to people with managerial responsibilities who aim to build a better and more effective work environment. Continuous improvement and innovation have links with the model of the learning organisation and people working at this level play an important role in building the culture, values and attitudes of the organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Review programs, systems and processes	1.1 Establish strategies to monitor and evaluate performance and sustainability of key systems and processes 1.2 Undertake detailed analyses of supply chains, and operational, product and service delivery systems 1.3 Identify performance measures, and assessment tools and techniques, and evaluate their effectiveness 1.4 Analyse performance reports and variance from plans for key result areas of the organisation 1.5 Identify and analyse changing trends and opportunities relevant to the organisation 1.6 Seek advice from specialists, where appropriate, to identify technology and electronic commerce opportunities
2. Develop options for continuous improvement	2.1 Brief groups on performance improvement strategies and innovation as an essential element of competition 2.2 Foster creative climate and organisational learning by promoting interaction within and between work groups 2.3 Encourage, test and recognise new ideas and entrepreneurial behaviour where successful 2.4 Accept failure of an idea during trialling and recognise, celebrate and embed success into systems 2.5 Undertake risk management and cost-benefit analysis for each option or idea approved for trial 2.6 Approve innovations through agreed organisational processes
3. Implement innovative processes	3.1 Promote continuous improvement and sustainability as essential to doing business 3.2 Address the impact of change and consequences for people and implement transition plans 3.3 Ensure objectives, timeframes, measures and communication plans are in place to manage implementation 3.4 Implement contingency plans in the event of non-performance 3.5 Follow up failure by prompt investigation and analysis of causes and manage emerging challenges and opportunities effectively

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Ensure that learnings from activities are captured and managed to inform future work 3.7 Regularly evaluate continuous improvement systems and processes 3.8 Communicate costs and benefits of innovations and improvements to relevant groups and individuals

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.6	• Plans and implements strategies to review and improve own performance
Reading	1.1-1.5, 2.5, 2.6, 3.2-3.5, 3.7	• Analyses, evaluates and integrates facts and ideas to construct meaning from a range of text types
Writing	1.1-1.5, 2.1, 2.5, 3.2, 3.3, 3.5, 3.6, 3.7, 3.8	• Integrates information and ideas from a range of sources, utilising appropriate support materials • Communicates complex relationships between ideas and information, matching style of writing to purpose and audience
Oral Communication	1.6, 2.1-2.4, 3.1, 3.5, 3.8	• Participates in a variety of spoken exchanges with co-workers and stakeholders when developing options and implementing the continuous improvement plan
Numeracy	1.1-1.5, 2.5, 3.3	• Selects and interprets mathematical information to analyse performance • Performs calculations required to establish timeframes, cost-benefits and measures for continuous improvement and innovation processes
Navigate the world of work	2.6	• Adheres to organisational policies and procedures and considers own role in terms of its contribution to broader goals of the work environment
Interact with others	1.6, 2.1-2.4, 3.1, 3.5, 3.8	• Recognises the importance of taking audience, purpose and contextual factors into account when making decisions about what to communicate, with whom, why and how • Recognises the importance of building rapport to establish positive and effective working relationships • Collaborates with others to achieve joint outcomes, playing an active role in encouraging innovation and facilitating effective group interaction
Get the work done	1.1, 1.2, 1.3, 1.5, 1.6, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.7	• Plans, organises, implements or reviews organisational strategies, systems and processes • Applies problem-solving processes to identify risks, evaluate options and determine solutions • Uses lateral and analytical thinking to evaluate options against needs, resources and constraints before making decisions • Facilitates a climate in which creativity and innovation

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		are accepted as an integral part of achieving outcomes • Recognises that the current way is only one way of doing something and explores possibilities that challenge current approaches • Actively identifies systems, devices and applications with potential to meet current and or future needs, with the help of specialists

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBMGT608 Manage innovation and continuous improvement	BSBMGT608C Manage innovation and continuous improvement	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBMGT608 Manage innovation and continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse and evaluate systems and performance in key areas of the organisation and identify opportunities for improvement, seeking advice from experts as appropriate
- promote the value of creativity, innovation and sustainability and recognise successes
- support the testing and trialling of new ideas and undertake risk management and cost-benefit analysis for options
- plan for and implement improvements using organisation's processes for approvals, project management and change management
- facilitate effective contributions to and communications about continuous improvement and innovation
- capture insights, experiences and ideas for improvements and incorporate them into the organisation's knowledge management systems and future planning.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline cost-benefit analysis methods
- describe creativity and innovation theories and concepts
- list organisational learning principles
- identify quality management and continuous improvement theories
- describe relevant risk management concepts
- outline relevant sustainability practices.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBPMG517 Manage project risk

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage risks that may impact achievement of project objectives. It involves identifying, analysing, treating and monitoring project risks, and assessing risk management outcomes.

It applies to individuals responsible for managing and leading a project in an organisation, business, or as a consultant.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Project Management

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify project risks	1.1 Determine risk objectives and standards, with input from stakeholders 1.2 Establish project risk context to inform risk management processes 1.3 Identify project risks using valid and reliable risk identification methods 1.4. Classify project risks within agreed risk categories
2. Analyse project risks	2.1 Determine risk analysis classification criteria and apply to agreed risk ranking system 2.2 Use risk analysis processes, within delegated authority, to analyse and qualify risks, threats and opportunities 2.3 Determine risk priorities in agreement with project client and other stakeholders 2.4 Document risk analysis outcomes for inclusion in risk register and risk management plan
3. Establish risk treatments and controls	3.1 Identify and document existing risk controls 3.2 Consider and determine risk treatment options using agreed consultative methods 3.3 Record and implement agreed risk treatments 3.4 Update risk plans and allocate risk responsibilities to project team members
4. Monitor and control project risks	4.1 Establish regular risk review processes to maintain currency of risk plans 4.2 Regularly monitor risk environment to identify changed circumstances impacting project risks 4.3 Determine risk responses to changed environment 4.4 Implement agreed risk responses and modify plans to maintain currency of risk treatments and controls
5. Assess risk management outcomes	5.1 Review project outcomes to determine effectiveness of risk-management processes and procedures 5.2 Identify and document risk management issues and recommended improvements for application to future projects

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 2.1, 2.2, 3.1, 3.2, 4.2, 5.1, 5.2	• Interprets and critically analyses complex texts from a range of sources and determines how content may be applied according to organisational requirements
Writing	1.3, 1.4, 2.1, 2.4, 3.1, 3.3, 3.4, 4.1, 4.3, 4.4, 5.2	• Documents risks, risk analysis and risk controls using required formats and structure • Modifies and updates workplace documentation according to requirements
Oral Communication	1.1, 2.3, 3.4	• Participates in verbal exchanges using clear language to provide and seek information • Uses active listening and questioning techniques to confirm understanding
Numeracy	1.3, 2.1, 2.3	• Analyses numerical data to identify project risk levels and rank risks according to agreed system of classification
Navigate the world of work	1.1, 2.2	• Determines and adheres to organisational policies and standards • Considers own role in terms of its contribution to broader goals of work environment
Interact with others	1.1, 2.3, 3.4	• Selects and uses appropriate conventions and protocols when communicating with internal and external stakeholders to seek or share information • Actively identifies requirements of important communication exchanges, selecting appropriate channels, format and content to suit purpose and audience
Get the work done	1.1-1.4, 2.1, 3.2, 4.1, 4.4, 5.1	• Identifies and develops approaches to risk management and implements complex tasks to achieve outcomes • Analyses information to make decisions, involving others when appropriate • Uses formal and informal processes to monitor implementation of decisions and reflect on outcomes

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBPMG517 Manage project risk	BSBPMG517A Manage project risk	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBPMG517 Manage project risk

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- conduct effective risk management for a project of sufficient complexity to demonstrate the full range of performance requirements
- apply risk management techniques, strategies and tools.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify project risks in a range of risk categories
- explain key components of a risk management plan
- outline industry sector risk classifications and relate these to different risk contexts
- summarise organisational and industry standard risk frameworks
- identify and describe characteristics, techniques and appropriate applications of quantitative and qualitative risk management techniques and approaches.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership – project management field of work and include access to:

- workplace risk management documentation
- feedback from project stakeholders about how risks were managed.

Assessors must satisfy NVR/AQTF assessor requirements.

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBSUS201 Participate in environmentally sustainable work practices

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to effectively measure current resource use and carry out improvements, including reducing the negative environmental impact of work practices.

It applies to individuals, working under supervision or guidance, who are required to follow workplace procedures and instructions, and work in an environmentally sustainable manner within scope of competency, authority and own level of responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Identify current resource use	1.1 Identify workplace environmental and resource efficiency issues 1.2 Identify resources used in own work role 1.3 Document and measure current usage of resources using appropriate techniques 1.4 Record and file documentation measuring current usage, using technology (such as software systems) where applicable 1.5 Identify and report workplace environmental hazards to appropriate personnel
2. Comply with environmental regulations	2.1 Follow workplace procedures to ensure compliance 2.2 Report breaches or potential breaches to appropriate personnel
3. Seek opportunities to improve resource efficiency	3.1 Follow organisational plans to improve environmental practices and resource efficiency 3.2 Work as part of a team, where relevant, to identify possible areas for improvements to work practices in own work area 3.3 Make suggestions for improvements to workplace practices in own work area

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 2.1, 3.1	• Recognises and interprets textual information to establish job requirements from relevant information
Writing	1.3, 1.4, 1.5, 2.2	• Completes documents using required formats
Oral Communication	1.5, 2.2, 3.3	• Articulates ideas clearly and uses simple and relevant language to identify and report issues to designated person
Numeracy	1.3	• Calculates basic metric measurements to determine resource usage
Navigate the world of work	2.1	• Understands and adheres to legal and regulatory responsibilities related to own work
Interact with others	1.5, 2.2, 3.2, 3.3	• Selects and uses appropriate conventions and protocols when communicating with co-workers in range of work contexts • Collaborates and cooperates with others to achieve joint outcomes
Get the work done	1.1-1.4, 3.1, 3.3	• Implements actions as per plan, taking some responsibility for sequencing and timing of tasks • Uses main features and functions of digital tools to complete work tasks and access information • Analyses current practices to identify opportunities for improvement.

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBSUS201 Participate in environmentally sustainable work practices	BSBSUS201A Participate in environmentally sustainable work practices	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBSUS201 Participate in environmentally sustainable work practices

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- locate and interpret a range of environment/sustainability legislation and procedural requirements
- participate in and support discussions for an improved resource efficiency process
- identify, document and measure usage of resources
- collaborate with team members on suggestions for improving workplace practices.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify environmental and resource hazards/risks as well as environmental or sustainability legislation, regulations and codes of practice applicable to own role
- outline sustainability requirements in the workplace
- identify reporting channels and procedures to report breaches and potential issues
- identify where to find environmental and resource efficiency systems and procedures.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the sustainability field of work and include access to:

- documentation, information and resources related to workplace environmental and resource efficiency issues
- office equipment and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBSUS301 Implement and monitor environmentally sustainable work practices

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to effectively analyse the workplace in relation to environmentally sustainable work practices and to implement improvements and monitor their effectiveness.

It applies to individuals with responsibility for a specific area of work or who lead a work group or team and addresses the knowledge, processes and techniques necessary to implement and monitor environmentally sustainable work practices, including the development of processes and tools.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Sustainability

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Investigate current practices in relation to resource usage	1.1 Identify environmental regulations applying to the enterprise 1.2 Analyse procedures for assessing compliance with environmental/sustainability regulations 1.3 Collect information on environmental and resource efficiency systems and procedures, and provide to the work group where appropriate 1.4 Collect, analyse and organise information from a range of sources to provide information/advice and tools/resources for improvement opportunities 1.5 Measure and document current resource usage of members of the work group 1.6 Analyse and document current purchasing strategies 1.7 Analyse current work processes to access information and data to assist in identifying areas for improvement
2. Set targets for improvements	2.1 Seek input from stakeholders, key personnel and specialists 2.2 Access external sources of information and data as required 2.3 Evaluate alternative solutions to workplace environmental issues 2.4 Set efficiency targets
3. Implement performance improvement strategies	3.1 Source and use appropriate techniques and tools to assist in achieving efficiency targets 3.2 Apply continuous improvement strategies to own work area of responsibility, including ideas and possible solutions to communicate to the work group and management 3.3 Implement and integrate environmental and resource efficiency improvement plans for own work group with other operational activities 3.4 Supervise and support team members to identify possible areas for improved practices and resource efficiency in work area 3.5 Seek suggestions and ideas about environmental and resource efficiency management from stakeholders and act upon where appropriate 3.6 Implement costing strategies to fully utilise environmental assets

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ELEMENT	PERFORMANCE CRITERIA
4. Monitor performance	4.1 Use and/or develop evaluation and monitoring, tools and technology 4.2 Document and communicate outcomes to report on efficiency targets to key personnel and stakeholders 4.3 Evaluate strategies and improvement plans 4.4 Set new efficiency targets, and investigate and apply new tools and strategies 4.5 Promote successful strategies and reward participants where possible

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.4, 1.6, 1.7, 2.3, 3.1	• Identifies and analyses complex texts to determine legislative, regulatory and business requirements • Reviews reported information to evaluate workplace strategies and improvement practices
Writing	1.5, 1.6, 2.1, 2.2, 2.4, 3.1-3.3, 4.4, 4.5	• Documents findings of investigations from written and oral sources according to organisational requirements • Provides updates about progress using formats and language appropriate to the audience and context
Oral Communication	2.1, 2.2, 3.3-3.5, 4.4, 4.5	• Presents information and seeks advice using structure and language appropriate to audience • Participates in discussions using listening and questioning to elicit the views of others and to clarify or confirm understanding
Numeracy	1.5, 2.4, 3.1, 3.6, 4.4	• Analyses numerical information to measure usage and calculates metric measurements, quantities/ratios and financial data using appropriate tools
Navigate the world of work	1.1, 1.2	• Recognises and follows legislative requirements and organisational policies and procedures associated with own role
Interact with others	1.3, 2.1, 2.2, 3.3-3.5, 4.2, 4.4, 4.5	• Selects and uses appropriate conventions and protocols when communicating with internal and external stakeholders to seek or share information • Collaborates and consults with a range of stakeholders to achieve shared understanding of individual roles in meeting objectives
Get the work done	1.2, 1.4-1.7, 2.3, 2.4, 3.1, 3.2, 3.3, 3.5, 3.6, 4.1, 4.3, 4.4	• Develops plans to manage routine and non-routine tasks for own work group with an awareness of how they contribute to the broader organisation • Uses systematic, analytical processes to set environmental targets, gather relevant information, identify and evaluate alternative approaches • Evaluates outcomes of decisions to identify opportunities for improvement • Uses the main features and functions of digital tools to complete work tasks and access information

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBSUS301 Implement and monitor environmentally sustainable work practices	BSBSUS301A Implement and monitor environmentally sustainable work practices	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes are available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBSUS301 Implement and monitor environmentally sustainable work practices

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- analyse information from a range of sources to identify current procedures, practices and compliance requirements in relation to environmental and resource sustainability
- consult and communicate with relevant stakeholders to seek input and encourage engagement with developing and implementing sustainability improvements, encourage feedback and suggestions and report on outcomes
- plan and organise work group activities to:
  - measure current resource usage
  - solve problems and generate ideas for improvements
  - evaluate and implement strategies to improve resource usage
  - plan, implement and integrate improvements into operations
  - meet environmental requirements
- apply continuous improvement approach to sustainability performance
- apply change management techniques to support sustainability performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify relevant internal and external sources of information and explain how they can be used to identify sustainability improvements
- explain the compliance requirements for the work area with reference to legislation, regulations, codes of practice and workplace procedures that relate to environmental and resource issues
- outline common environmental and energy efficiency issues within the industry
- give examples of benchmarks for environmental and resource sustainability that are relevant to the organisation
- outline organisational systems and procedures that relate to environmental and resource sustainability improvements including:
  - supply chain, procurement and purchasing
  - quality assurance
  - making recommendations and seeking approvals

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the sustainability field of work and include access to:

- relevant legislation, regulations, standards and codes
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBSUS501 Develop workplace policy and procedures for sustainability

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and implement a workplace sustainability policy and to modify the policy to suit changed circumstances.

It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

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Unit Sector

Industry Capability – Sustainability

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop workplace sustainability policy	1.1 Define scope of sustainability policy 1.2 Gather information from a range of sources to plan and develop policy 1.3 Identify and consult stakeholders as a key component of the policy development process 1.4 Include appropriate strategies in policy at all stages of work for minimising resource use, reducing toxic material and hazardous chemical use and employing life cycle management approaches 1.5 Make recommendations for policy options based on likely effectiveness, timeframes and cost 1.6 Develop policy that reflects the organisation's commitment to sustainability as an integral part of business planning and as a business opportunity 1.7 Agree to appropriate methods of implementation, outcomes and performance indicators
2. Communicate workplace sustainability policy	2.1 Promote workplace sustainability policy, including its expected outcome, to key stakeholders 2.2 Inform those involved in implementing the policy about expected outcomes, activities to be undertaken and assigned responsibilities
3. Implement workplace sustainability policy	3.1 Develop and communicate procedures to help implement workplace sustainability policy 3.2 Implement strategies for continuous improvement in resource efficiency 3.3 Establish and assign responsibility for recording systems to track continuous improvements in sustainability approaches
4. Review workplace sustainability policy implementation	4.1 Document outcomes and provide feedback to key personnel and stakeholders 4.2 Investigate successes or otherwise of policy

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ELEMENT	PERFORMANCE CRITERIA
	4.3 Monitor records to identify trends that may require remedial action and use to promote continuous improvement of performance 4.4 Modify policy and or procedures as required to ensure improvements are made

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 4.2, 4.3	• Identifies, analyses and evaluates complex textual information to determine legislative and regulatory requirements, trends and outcomes
Writing	1.2-1.7, 2.1, 2.2, 3.1, 3.3, 4.1, 4.3, 4.4	• Researches, plans and prepares documentation using format and language appropriate to context, organisational requirements and audience
Oral Communication	1.2, 1.3, 2.1, 2.2, 3.1, 4.1	• Presents information and seeks advice using language appropriate to audience • Participates in discussions using listening and questioning to elicit the views of others and to clarify or confirm understanding
Numeracy	1.5, 4.3	• Interprets and uses mathematical equations to calculate numerical information relating to time durations and costs
Navigate the world of work	1.1-1.6, 3.1, 4.4	• Develops, monitors and modifies organisational policies and procedures in accordance with legislative requirements and organisation goals
Interact with others	1.2, 1.3, 2.1, 2.2, 3.1, 3.3, 4.1, 4.3	• Selects and uses appropriate conventions and protocols when communicating with internal and external stakeholders to seek or share information • Plays a lead role in consulting and negotiating positive outcomes with a range of stakeholders
Get the work done	1.2, 1.4-1.7, 2.3, 2.4, 3.1, 3.2, 3.3, 3.5, 3.6, 4.1, 4.3, 4.4	• Plans, organises and implements work activities of self and others that ensure compliance with organisational policies and procedures, and legislative requirements • Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic, analytical processes in relatively complex, situations, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Evaluates outcomes of decisions to identify opportunities for improvement

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBSUS501 Develop workplace policy and procedures for sustainability	BSBSUS501A Develop workplace policy and procedures for sustainability	Updated to meet Standards for Training Packages Minor edits to clarify performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBSUS501 Develop workplace policy and procedures for sustainability

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- scope and develop organisational policies and procedures that comply with legislative requirements and support the organisation's sustainability goals covering at a minimum:
  - minimising resource use
  - resource efficiency
  - reducing toxic material and hazardous chemical use
  - employing life cycle management approaches
  - continuous improvement
- plan and implement sustainability policy and procedures including:
  - agreed outcomes
  - performance indicators
  - activities to be undertaken
  - assigned responsibilities
  - record keeping, review and improvement processes
- consult and communicate with relevant stakeholders to generate engagement with sustainability policy development, implementation and continuous improvement
- review and improve sustainability policies.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the environmental or sustainability legislation, regulations and codes of practice applicable to the organisation identify internal and external sources of information and explain how they can be used to plan and develop the organisation's sustainability policy
- explain policy development processes and practices
- outline organisational systems and procedures that relate to sustainability
- outline typical barriers to implementing policies and procedures in an organisation and possible strategies to address them.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the sustainability field of work and include access to:

- relevant legislation, regulations, standards and codes
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBWHS201 Contribute to health and safety of self and others

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to work in a manner that is healthy and safe in relation to self and others and to respond to emergency incidents. It covers following work health and safety (WHS) and emergency procedures and instructions, implementing WHS requirements and participating in WHS consultative processes.

It applies to individuals who require a basic knowledge of WHS to carry out work in a defined context under direct supervision or with some individual responsibility, in a range of industry and workplace contexts.

NOTE: The terms 'occupational health and safety' (OHS) and 'work health and safety' (WHS) are equivalent and generally either can be used in the workplace. In jurisdictions where the Model WHS *Act* has not been implemented RTOs are advised to contextualise the unit of competency by referring to the existing State/Territory OHS legislative requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Work Health and Safety

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Work safely	1.1 Follow provided safety procedures and instructions when working 1.2 Carry out pre start systems and equipment checks according to workplace procedures 1.3 Follow workplace procedures for responding to emergency incidents
2. Implement work safety requirements	2.1 Identify designated persons to whom queries and concerns about safety in the workplace should be directed 2.2 Identify existing and potential hazards in the workplace, report them to designated persons and record them according to workplace procedures 2.3 Identify and implement WHS procedures and work instructions 2.4 Identify and report emergency incidents and injuries to designated persons according to workplace procedures 2.5 Identify WHS duty holders and their duties for own work area
3. Participate in WHS consultative processes	3.1 Contribute to workplace meetings, inspections and other WHS consultative activities 3.2 Raise WHS issues with designated persons according to organisational procedures 3.3 Take actions to eliminate workplace hazards and reduce risks

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 2.3, 2.4, 2.5	• Identifies and interprets information in relation to WHS and emergency incidents
Writing	1.2, 2.2, 2.4, 3.2	• Uses structures and language appropriate to audience and context in reports giving factual information
Oral Communication	2.2, 2.3, 2.4, 3.1, 3.2	• Uses structures and language appropriate to audience and context in reports, descriptions, opinions and explanations • Extracts meaning from reports, descriptions, opinions and explanations
Navigate the world of work	1.1, 1.2, 1.3, 2.1,2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	• Takes responsibility for following WHS legal requirements • Follows protocols and procedures related to own role • Seeks assistance from others when WHS issues are beyond scope of immediate responsibilities
Get the work done	1.1, 1.2, 1.3, 2.2, 2.3, 2.4, 3.1, 3.3	• Plans, organises and implements routine tasks in order to optimise health and safety • Selects and implements actions from predetermined procedures

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBWHS201 Contribute to health and safety of self and others	BSBWHS201A Contribute to health and safety of self and others	Updated to meet Standards for Training Packages Minor edits to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWHS201 Contribute to health and safety of self and others

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

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Performance Evidence

Evidence of the ability to:

- follow all relevant procedures and instructions relating to work health and safety (WHS) and emergency incidents
- identify and report hazards to designated personnel
- contribute to WHS consultative processes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain workplace safety procedures and instructions including:
  - checking systems and equipment
  - conducting routine work operations
  - requirements for personal protective equipment (PPE)
  - how to report incidents and injuries
- explain emergency procedures including those for fires and incidents
- define the meaning of commonly used hazard signs and safety symbols
- summarise the duty holder responsibilities, as specified in WHS Acts, regulations and codes of practice, of:
  - self and fellow workers
  - persons conducting businesses or undertakings (PCBUs)
  - officers
  - others in the workplace
- explain the difference between hazards and risks
- describe typical WHS hazards that may be present in the workplace, the harm they can cause and how this harm occurs
- outline the process of hazard identification and risk reduction.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals carrying out work health and safety duties in the workplace and include access to:

- relevant organisational policies, standard operating procedures and work instructions
- relevant Acts, regulations, codes of practice
- workplace tools, equipment and resources
- personal protective equipment appropriate to the role and work area.

Assessors must satisfy NVR/AQTF assessor requirements.

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BSBWHS304 Participate effectively in WHS communication and consultation processes

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to participate in work health and safety (WHS) communication and consultation processes.

It applies to individuals who participate in WHS communication and consultation processes as part of their work health and safety responsibilities, which are in addition to their main duties.

NOTE: The terms 'occupational health and safety' (OHS) and 'work health and safety' (WHS) are equivalent and generally either can be used in the workplace. In jurisdictions where the National Model WHS Legislation has not been implemented RTOs are advised to contextualise the unit of competency by referring to the existing State/Territory OHS legislative requirements.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Work Health and Safety

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Contribute to establishing and running WHS consultation and participation processes	1.1 Apply knowledge of WHS Acts, regulations, codes of practice, policies and procedures to contribute to the development and running of WHS consultation and participation processes 1.2 Identify and communicate barriers to effective WHS consultation and participation processes 1.3 Contribute to removing these barriers 1.4 Identify, record and communicate to others, the duties, rights and responsibilities of individuals and parties in the consultation process
2. Raise WHS issues with others	2.1 Raise relevant WHS issues in meetings and support others to do this 2.2 Record and communicate WHS discussions and their outcomes in accordance with workplace procedures 2.3 Effectively follow up the outcomes of meetings as appropriate 2.4 Communicate outcomes of these meetings to others
3. Contribute to obtaining and communicating information about WHS issues	3.1 Identify sources of WHS information 3.2 Use tools and techniques to locate and obtain WHS information 3.3 Communicate relevant WHS information to others using appropriate communication methods

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.4, 3.1, 3.2	• Interprets a range of textual information to determine regulatory and procedural requirements and necessary actions
Writing	1.2, 1.4, 2.2, 2.4, 3.3	• Records key information in a sequential manner using required format, correct grammar and industry specific vocabulary
Oral Communication	1.2, 1.4, 2.1, 2.2, 2.4, 3.3	• Present information using language and non-verbal features appropriate to audience • Uses questioning and listening techniques to obtain feedback from others and resolve issues
Navigate the world of work	1.1, 2.2	• Follows policies, procedures and legislative requirements relevant to own role
Interact with others	1.1, 1.4, 2.1, 2.2, 2.4, 3.3	• Selects and uses appropriate conventions and protocols when communicating with others in a range of work contexts • Uses appropriate interpersonal skills to encourage contributions and elicit ideas from others
Get the work done	1.1-1.4, 2.1, 2.3, 3.1-3.3	• Sequences and schedules activities, monitors implementation and manages relevant communication • Identifies barriers to consultation and applies problem solving processes to determine possible solutions • Uses the main features and functions of digital tools to access information or communicate effectively

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBWHS304 Participate effectively in WHS communication and consultation processes	BSBWHS304A Participate effectively in WHS communication and consultation processes	Updated to meet Standards for Training Packages Minor edits to clarify intent of performance criteria	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWHS304 Participate effectively in WHS communication and consultation processes

Modification History

Release	Comments
Revision 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- participate in work health and safety (WHS) communication and consultation processes, including communicating WHS information to others
- raise WHS issues in meetings and follow up on outcomes
- take appropriate actions to remove barriers to communication and consultation processes
- support others to raise relevant WHS issues.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the purpose of organisational WHS policies, procedures, processes and systems
- outline the key requirements of relevant commonwealth and state/territory WHS Acts, regulations, codes of practice, standards and guidance material, and other relevant publications
- describe potential barriers to WHS consultation processes and how the barriers may be overcome
- explain the roles and responsibilities of WHS personnel
- describe how the consultation process influences and is related to workplace information management procedures, processes and systems
- describe methods to engage others with workplace procedures, and information sourcing and sharing.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals carrying out work health and safety duties in the workplace and include access to:

- organisational policies, standard operating procedures, procedures and plans with information on compliance requirements
- relevant Acts, regulations, codes of practice, licensing requirements, standards
- relevant WHS data files
- appropriate office equipment and resources.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBWHS403 Contribute to implementing and maintaining WHS consultation and participation processes

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to contribute to setting up, running and improving work health and safety (WHS) consultation and participation processes that are prescribed in legislation. It also covers contributing to communicating relevant information identifying and delivering related training and improving the consultation and participation processes.

This unit applies to individuals whose job role includes contributing to implementing and maintaining WHS consultation and participation processes in their work area and job role.

This unit applies to people who work in a broad range of WHS roles across all industries.

NOTE: The terms 'occupational health and safety' (OHS) and 'work health and safety' (WHS) are equivalent and generally either can be used in the workplace. In jurisdictions where the Model WHS Legislation has not been implemented RTOs are advised to contextualise the unit of competency by referring to the existing State/Territory OHS legislative requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Work Health and Safety

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Identify individuals and parties involved in WHS consultation and participation processes	1.1 Apply knowledge of relevant parts of WHS Acts, regulations, codes of practice, policies and procedures to identify individuals and parties with roles, duties, rights and responsibilities regarding WHS consultation and participation 1.2 Identify what these roles, duties, rights and responsibilities are and, in line with own job role and work area, communicate this information to individuals and parties 1.3 Identify roles, duties, rights and responsibilities as they apply to own job role and work area
2 Contribute to WHS consultation and participation processes	2.1 Identify workplace WHS consultation and participation processes 2.2 Contribute to setting up and running these processes as appropriate to own job role and work area 2.3 Communicate to individuals and parties what these processes are and promote and support the participation of individuals and parties as appropriate to own job role and work area
3 Contribute to processes for communicating and sharing WHS information and data	3.1 Identify consultation and participation processes for communicating and sharing WHS information and data 3.2 Contribute to and participate in these processes, as appropriate to own job role and work area
4 Contribute to identifying and meeting training requirements for effective WHS consultation and participation	4.1 Identify training requirements for individuals and parties necessary for effective WHS consultation and participation 4.2 Contribute to the delivery of required training as appropriate to own job role and work area
5 Contribute to improving WHS consultation and participation processes	5.1 Contribute to the identification and assessment of barriers to the implementation and effectiveness of WHS consultation and participation processes 5.2 Contribute to the development, implementation and evaluation of measures to remove these barriers

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.3, 2.1, 3.1, 4.1	• Interprets and analyses complex WHS legislative and organisational texts
Writing	1.2, 2.2, 2.3, 4.1, 4.2, 5.1, 5.2	• Uses structure, layout and language suitable for audience to draft and document WHS legislative and organisational information • Records required WHS information using appropriate organisational formats
Oral communication	1.2, 2.2, 2.3	• Uses structure and language suitable for audience to provide WHS legislative and organisational information • Uses questioning and active listening to identify and discuss training requirements and barriers to WHS consultation processes
Navigate the world of work	1.1-1.3	• Takes responsibility for adherence to legal and regulatory responsibilities in relation to WHS role and responsibilities • Keeps up to date on changes to WHS legislation or regulations
Interact with others	2.2, 2.3, 3.1, 3.2, 4.2, 5.1, 5.2	• Understands what to communicate, with whom and how in context of consultation and participation processes • Uses a range of strategies to establish a sense of connection with others • Cooperates with others as part of WHS consultation and participation processes, and contributes to specific activities requiring joint responsibility and accountability • Initiates and contributes to facilitating consultative process, responding, explaining, clarifying and expanding on ideas and information as required
Get the work done	2.1, 2.2, 3.1, 4.1, 5.1, 5.2	• Applies formal processes when organising consultation processes, producing plans with logically sequenced steps, reflecting some awareness of time and resource constraints and the needs of others • Implements actions as per plans, making slight adjustments as necessary and addressing some unexpected issues

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		• Uses formal decision-making processes, setting or clarifying goals, gathering information and identifying and evaluating choices against a set of criteria • Uses formal and informal processes to monitor implementation of measures and reflect on outcomes • Uses familiar digital systems and tools to access, organise, analyse and present information

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWHS403 Contribute to implementing and maintaining WHS consultation and participation processes	BSBWHS403A Contribute to implementing and maintaining WHS consultation and participation processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWHS403 Contribute to implementing and maintaining WHS consultation and participation processes

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- explain clearly and accurately to individuals and parties the legal roles, duties, rights and responsibilities of self and others regarding work health and safety (WHS) consultation and participation processes
- contribute, as appropriate to job role and work area, to:
  - setting up and running WHS consultation and participation processes to ensure that relevant individuals and parties understand and can participate in the processes
  - identifying training needs to support the WHS consultation and participation processes and providing learning opportunities, coaching and mentoring as appropriate to needs
  - communicating information and data about WHS consultation and participation processes
  - identifying barriers to effective WHS consultation and participation and developing, implementing and evaluating measures to remove the barriers.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe requirements under WHS legislation and organisational policies and procedures for consultation and participation processes and the individuals and parties who need to participate
- describe possible barriers to the implementation and effectiveness of WHS consultation and participation processes and strategies to remove them
- identify internal and external sources of WHS information and data and how to access them
- describe training requirements for individuals and parties necessary for effective WHS consultation and participation processes

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals carrying out work health and safety duties in the workplace and include access to:

- office equipment and resources
- relevant Acts, regulations, codes of practice, standards and guidelines
- workplace documentation and personnel.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBWHS501 Ensure a safe workplace

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish, maintain and evaluate the organisation's work health and safety (WHS) policies, procedures and programs in the relevant work area, according to WHS legislative requirements. It takes a systems approach and addresses compliance with relevant legislative requirements.

This unit applies to managers working in a range of contexts who have, or are likely to have responsibility for WHS as part of their broader management role. It is relevant for people with obligations under WHS legislation, for example persons conducting a business or undertaking (PCBUs) or officers, as defined by relevant legislation.

NOTE: The terms 'occupational health and safety' (OHS) and 'work health and safety' (WHS) are equivalent and generally either can be used in the workplace. In jurisdictions where the Model WHS Legislation has not been implemented RTOs are advised to contextualise the unit of competency by referring to the existing State/Territory OHS legislative requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Work Health and Safety

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Establish a WHS management system in a work area	1.1 Locate, adapt, adopt and communicate WHS policies that clearly define the organisation's commitment to complying with WHS legislation 1.2 Identify duty holders and define WHS responsibilities for all workplace personnel in the work area according to WHS legislation, policies, procedures and programs 1.3 Identify and approve financial and human resources required by the WHS management system (WHSMS)
2 Establish and maintain effective and compliant participation arrangements for managing WHS in a work area	2.1 Work with workers and their representatives to set up and maintain participation arrangements according to relevant WHS legislation 2.2 Appropriately resolve issues raised through participation and consultation arrangements according to relevant WHS legislation 2.3 Promptly provide information about the outcomes of participation and consultation to workers and ensure it is easy for them to access and understand
3 Establish and maintain procedures for effectively identifying hazards, and assessing and controlling risks in a work area	3.1 Develop procedures for ongoing hazard identification, and assessment and control of associated risks 3.2 Include hazard identification at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created by the proposed changes and existing hazards are controlled 3.3 Develop and maintain procedures for selecting and implementing risk controls according to the hierarchy of control and WHS legislative requirements 3.4 Identify inadequacies in existing risk controls according to the hierarchy of control and WHS legislative requirements, and promptly provide resources to enable implementation of new measures 3.5 Identify requirements for expert WHS advice, and request this advice as required
4 Evaluate and maintain a work area WHS management system	4.1 Develop and provide a WHS induction and training program for all workers in a work area as part of the organisation's training program 4.2 Use a system for WHS record keeping to allow identification of

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ELEMENT	PERFORMANCE CRITERIA
	patterns of occupational injury and disease in the organisation, and to maintain a record of WHS decisions made, including reasons for the decision 4.3 Measure and evaluate the WHSMS in line with the organisation's quality systems framework 4.4 Develop and implement improvements to the WHSMS to achieve organisational WHS objectives 4.5 Ensure compliance with the WHS legislative framework to achieve, as a minimum, WHS legal requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 4.2, 4.3, 4.5	• Organises, evaluates and critiques ideas and information from WHS legislation, policies, procedures and programs
Writing	1.1, 2.3, 3.2, 3.5, 4.1, 4.2	• Produces WHS policies, procedures and programs • using appropriate vocabulary, grammatical structure and conventions to produce • Records WHS decisions according to organisational requirements
Oral communication	1.1, 2.1, 2.2, 2.3	• Presents and seeks information from others using structure and language suitable for the audience • Provides information on resolution of WHS issues varying level of technical vocabulary to suit audience
Numeracy	1.3	• Selects from, and applies, an expanding range of mathematical and problem solving strategies in identifying financial and human resources required
Navigate the world of work	1.1, 1.2, 2.1, 2.2, 3.3, 3.4, 4.5	• Monitors adherence to legal and regulatory rights and responsibilities for self and others in relation to WHS • Takes responsibility for developing, implementing and reviewing policies, procedures and processes in accordance with organisational and legislative requirements

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Interact with others	1.1, 2.1, 2.3, 3.5	• Plays a lead role in situations requiring effective collaboration demonstrating the ability to guide discussions and negotiate agreeable outcomes • Provides feedback to others in forms they can understand and use
Get the work done	1.1, 1.3, 2.1, 2.2, 2.3, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2 4.3, 4.4, 4.5	• Develops plans or processes to manage relatively complex, WHS management tasks with an awareness of how they contribute to operational and strategic goals • Uses systematic, analytical processes, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Considers whether, and how, others should be involved, using consultative or collaborative processes as an integral part of the decision-making process • Uses digital systems and tools to enter, store and retrieve relevant information

Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

WHS legislation must include:	• applicable Commonwealth and state or territory WHS Acts, regulations and codes of practice.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWHS501 Ensure a safe workplace	BSBWHS501A Ensure a safe workplace	Updated to meet Standards for Training Packages	Equivalent unit

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Assessment Requirements for BSBWHS501 Ensure a safe workplace

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish, implement, maintain and evaluate a work health and safety (WHS) management system for a work area of an organisation in accordance with WHS legislation including policies, procedures and record keeping
- ensure organisational WHS compliance
- establish, implement, maintain and evaluate effective and compliant participation arrangements for managing WHS including identifying duty holders, identifying and approving the required resources and developing and implementing a training program
- establish, implement, maintain and evaluate procedures for effectively identifying hazards, and assessing and controlling risks using the hierarchy of risk control
- provide information and complete documentation for a WHS management system
- identify requirements for and request expert WHS advice.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and detail relevant WHS Acts, regulations and codes of practice
- specify relevant WHS organisational policies, procedures, programs and practices
- explain hazard identification and risk-management processes
- describe the hierarchy of risk control and how it is applied in the workplace
- specify in-house and WHS legislative reporting requirements.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals carrying out work health and safety duties in the workplace and include access to:

- organisational WHS policies and procedures
- WHS legislation, regulations and codes of practice
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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BSBWOR301 Organise personal work priorities and development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to organise own work schedules, to monitor and obtain feedback on work performance and to maintain required levels of competence.

This unit applies to individuals who exercise discretion and judgement and apply a broad range of competencies in various work contexts.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Organise and complete own work schedule	1.1 Ensure that work goals, objectives or Key Performance Indicators (KPIs) are understood, negotiated and agreed in accordance with organisational requirements 1.2 Assess and prioritise workload to ensure tasks are completed within identified timeframes 1.3 Identify factors affecting the achievement of work objectives and incorporate contingencies into work plans 1.4 Use business technology efficiently and effectively to manage and monitor scheduling and completion of tasks
2. Monitor own work performance	2.1 Accurately monitor and adjust personal work performance through self assessment to ensure achievement of tasks and compliance with legislation and work processes or KPIs 2.2 Ensure that feedback on performance is actively sought and evaluated from colleagues and clients in the context of individual and group requirements 2.3 Routinely identify and report on variations in the quality of and products and services according to organisational requirements 2.4 Identify signs of stress and effects on personal wellbeing 2.5 Identify sources of stress and access appropriate supports and resolution strategies
3. Co-ordinate personal skill development and learning	3.1 Identify personal learning and professional development needs and skill gaps using self assessment and advice from colleagues and clients in relation to role and organisational requirements 3.2 Identify, prioritise and plan opportunities for undertaking personal skill development activities in liaison with work groups and relevant personnel 3.3 Access, complete and record professional development opportunities to facilitate continuous learning and career development 3.4 Incorporate formal and informal feedback into review of further learning needs

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1-3.4	• Employs a range of approaches and investigative techniques to source the knowledge necessary to arrange personal learning experiences
Reading	1.1, 1.2, 2.1	• Interprets textual information to determine organisation's procedures, own work performance and objectives
Writing	1.3, 1.4, 2.3, 3.1, 3.2, 3.3	• Prepares written reports and workplace documents that communicate information clearly and effectively
Oral Communication	2.2, 2.3, 3.1, 3.2	• Clearly gives and receives feedback using specific and relevant language • Uses listening and questioning techniques to confirm understanding
Numeracy	1.1, 1.3	• Understands responsibilities and scope of role and complies with organisational policies, procedures and protocols
Interact with others	1.1, 2.2, 2.3, 3.1, 3.2	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Fosters and nurtures a culture of constructive and respectful feedback • Proactively collaborates with others to achieve specific goals
Get the work done	1.2, 1.3, 1.4, 2.4, 2.5, 3.2	• Plans and organises work commitments to ensure deadlines and objectives are met • Uses formal analytical thinking techniques to recognise and respond to routine problems • Uses digital systems and tools to enter, store and monitor information

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBWOR301 Organise personal work priorities and development	BSBWOR301B Organise personal work priorities and development	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWOR301 Organise personal work priorities and development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare a work plan according to organisational requirements and work objectives
- use business technology to schedule, prioritise and monitor completion of tasks in a work plan
- assess and prioritise own work load and deal with contingencies
- monitor and assess personal performance against job role requirements by seeking feedback from colleagues and clients
- identify personal development needs and access, complete and record skill development and learning.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline key provisions of legislation that relate to own work role
- describe goals, objectives or key performance indicators of own work role
- explain ways to elicit, analyse and interpret feedback when communicating with other people in the workplace
- explain the principles and techniques of goal setting, measuring performance, time management and personal assessment of learning and development needs
- explain signs and sources of stress and strategies to deal with stress in the workplace
- identify methods to identify and prioritise personal learning needs.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- office equipment and resources
- work schedules and performance improvement plans
- workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBWOR404 Develop work priorities

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and obtain feedback on own work performance and access learning opportunities for professional development.

This unit applies to individuals who are required to design their own work schedules and work plans and to establish priorities for their work. They will typically hold some responsibilities for the work of others and have some autonomy in relation to their own role.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and complete own work schedule	1.1 Prepare workgroup plans which reflect consideration of resources, client needs and workgroup targets 1.2 Analyse and incorporate work objectives and priorities into personal schedules and responsibilities 1.3 Identify factors affecting the achievement of work objectives and establish contingencies and incorporate them into work plans 1.4 Efficiently and effectively use business technology to manage and monitor planning completion and scheduling of tasks
2. Monitor own work performance	2.1 Identify and analyse personal performance through self-assessment and feedback from others on the achievement of work objectives 2.2 Seek and evaluate feedback on performance from colleagues and clients in the context of individual and group requirements 2.3 Routinely identify and report on variations in the quality of service and performance in accordance with organisational requirements
3. Co-ordinate professional development	3.1 Assess personal knowledge and skills against organisational benchmarks to determine development needs and priorities 3.2 Research and identify sources and plan for opportunities for improvement in consultation with colleagues 3.3 Use feedback to identify and develop ways to improve competence within available opportunities 3.4 Identify, access and complete professional development activities to assist career development 3.5 Store and maintain records and documents relating to achievements and assessments in accordance with organisational requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1, 3.2, 3.3, 3.4	• Develops strategies to reflect on own performance, obtain feedback, and plan and source professional development opportunities
Reading	1.2, 2.1, 2.3, 3.1, 3.5	• Recognises and interprets textual information from relevant sources to understand organisation's policies and practices
Writing	1.1, 1.3, 2.2, 2.3, 3.2, 3.5	• Prepares written reports and workplace documentation that communicate complex information clearly and effectively
Oral Communication	2.2, 2.3, 3.2	• Provides or seeks information using language suitable to audience and context • Employs listening and questioning techniques to confirm understanding
Numeracy	1.1, 1.2, 1.3	• Interprets numerical information related to budgets and timeframes
Navigate the world of work	1.2, 2.1, 2.3, 3.1, 3.5	• Identifies and understands roles and responsibilities in relation to organisational objectives, policies and procedures
Interact with others	2.2, 2.3, 3.2	• Selects and uses appropriate practices when communicating with internal and external stakeholders to seek or share information • Establishes and builds rapport and relationships with others to foster a culture of trust and honesty in communications
Get the work done	1.1-1.4, 2.3, 3.1, 3.2, 3.4, 3.5	• Plans, organises and implements tasks to meet organisational requirements • Systematically gathers and analyses information and evaluates options in order to anticipate potential problems and develop contingency plans • Uses the main features and functions of digital technologies and tools to complete work tasks efficiently and effectively

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBWOR404 Develop work priorities	BSBWOR404A Develop work priorities	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion volumes available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWOR404 Develop work priorities

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare and communicate own work plan
- schedule work objectives and tasks to support the achievement of the workgroup goals
- review own work performance against workgroup objectives through self-assessment and seeking and acting on feedback from clients and colleagues
- plan and access learning opportunities to extend personal work competencies.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how business technology applications can be used to schedule tasks and plan work
- explain techniques to prepare personal plans and establish priorities
- identify methods to identify and prioritise personal learning needs
- outline a range of professional development options
- explain methods to elicit, analyse and interpret feedback
- provide a detailed explanation of methods that can be used to evaluate own performance.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- workplace documentation including policies and procedures, and benchmarks for work group productivity and performance
- workplace equipment and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
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BSBWOR502 Lead and manage team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead teams in the workplace and to actively engage with the management of the organisation.

It applies to individuals working at a managerial level who facilitate work teams and build a positive culture within their work teams. At this level, work will normally be carried out using complex and diverse methods and procedures requiring the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish team performance plan	1.1 Consult team members to establish a common understanding of team purpose, roles, responsibilities and accountabilities in accordance with organisational goals, plans and objectives 1.2 Develop performance plans to establish expected outcomes, outputs, key performance indicators (KPIs) and goals for work team 1.3 Support team members in meeting expected performance outcomes
2. Develop and facilitate team cohesion	2.1 Develop strategies to ensure team members have input into planning, decision making and operational aspects of work team 2.2 Develop policies and procedures to ensure team members take responsibility for own work and assist others to undertake required roles and responsibilities 2.3 Provide feedback to team members to encourage, value and reward individual and team efforts and contributions 2.4 Develop processes to ensure that issues, concerns and problems identified by team members are recognised and addressed
3. Facilitate teamwork	3.1 Encourage team members and individuals to participate in and to take responsibility for team activities, including communication processes 3.2 Support the team in identifying and resolving work performance problems 3.3 Ensure own contribution to work team serves as a role model for others and enhances the organisation's image for all stakeholders
4. Liaise with stakeholders	4.1 Establish and maintain open communication processes with all stakeholders 4.2 Communicate information from line manager/management to the team 4.3 Communicate unresolved issues, concerns and problems raised by team members and follow-up with line manager/management and other relevant stakeholders 4.4 Evaluate and take necessary corrective action regarding

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ELEMENT	PERFORMANCE CRITERIA
	unresolved issues, concerns and problems raised by internal or external stakeholders

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 4.4	• Analyses and interprets textual information from the organisation's policies, goals and objectives to establish team goals or to determine corrective action
Writing	1.2, 2.1, 2.2, 2.4, 4.2, 4.3, 4.4	• Prepares written reports and workplace documentation that communicate complex information clearly and effectively
Oral Communication	1.1, 2.3, 3.1, 4.1, 4.2, 4.3	• Engages in discussions or provides information using appropriate vocabulary and non-verbal features • Uses listening and questioning techniques to confirm understanding and to engage the audience
Navigate the world of work	1.1, 2.1, 2.2, 3.3	• Understands how own role contributes to broader organisational goals • Modifies or develops policies and procedures to achieve organisational goals
Interact with others	1.1, 1.3, 2.2, 2.3, 3.1, 3.2, 4.2, 4.3	• Selects and uses appropriate conventions and protocols when communicating with diverse stakeholders • Uses interpersonal skills to gain trust and confidence of team and provides feedback to others in forms that they can understand and use • Adapts personal communication style to build positive working relationships and to show respect for the opinions, values and particular needs of others • Plays a lead role in situations requiring effective collaboration, demonstrating high level conflict resolution skills and ability to engage and motivate others
Get the work done	1.2, 2.1, 2.2, 2.4, 3.2, 4.1, 4.3, 4.4	• Develops, implements and monitors plans and processes to ensure team effectiveness • Monitors and actively supports processes and development activities to ensure the team is focused on work outcomes • Plans for unexpected outcomes and implements creative responses to overcome challenges

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBWOR502 Lead and manage team effectiveness	BSBWOR502B Ensure team effectiveness	Updated to meet Standards for Training Packages Title change	Equivalent unit

Links

Companion volumes are available from the IBSA website: http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for BSBWOR502 Lead and manage team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use leadership techniques and strategies to facilitate team cohesion and work outcomes including:
  - encouraging and fostering shared understanding of purpose, roles and responsibilities
  - identifying and resolving problems
  - providing feedback to encourage, value and reward others
  - modelling desired behaviour and practices
- develop policies and procedures to ensure team members take responsibility for own work and assist others to undertake required roles and responsibilities
- establish processes to address issues and resolve performance issues
- support team to meet expected performance outcomes including providing formal and informal learning opportunities as needed
- develop performance plans with key performance indicators (KPIs), outputs and goals for individuals or the team which incorporate input from stakeholders
- communicate effectively with a range of stakeholders about team performance plans and team performance
- facilitate two-way flow of information between team and management relevant to team performance
- evaluate and take necessary corrective action regarding unresolved issues, concerns and problems raised by internal or external stakeholders.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how group dynamics can support or hinder team performance
- outline strategies that can support team cohesion, participation and performance
- explain strategies for gaining consensus
- explain issue resolution strategies.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- workplace documents
- case studies and, where possible, real situations
- office equipment and resources
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes are available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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CPPSEC3009A Prepare and present evidence in court

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to prepare and present information which may be used in a judicial or quasi-judicial environment as evidence. It requires the ability to gather and manage information, prepare and give evidence in court, store evidence and complete documentation.

This unit may form part of the licensing requirements for persons engaging in security operations in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has wide application in the security industry in those roles involving operational activities. Competency requires legal and operational knowledge applicable to relevant sectors of the security industry. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Gather and organise evidence.	1.1 Applicable provisions of ***legislative*** and ***organisational requirements*** relevant to the preparation and presentation of ***evidence*** are identified and complied with.
	1.2 A summary of the case history and other ***relevant information*** is gathered and organised.
	1.3 Information to be used as evidence is confirmed for reliability and relevance in accordance with organisational procedures.
	1.4 Evidence is organised in accordance with ***evidence management*** principles.
2 Prepare for court proceedings.	2.1 Briefing sessions are held with relevant persons to confirm ***court arrangements***, role and involvement.
	2.2 Information to be presented as evidence and negotiation parameters is discussed with ***relevant persons***.
	2.3 Briefs of evidence are submitted in a logical sequence appropriate to jurisdictional requirements and comply with the relevant rules of evidence.
	2.4 Material to be used or referred to in court proceedings is thoroughly reviewed prior to presentation in court to ensure familiarity, completeness and availability.
	2.5 ***Documentation and exhibits*** are prepared to ensure their acceptability for use in court in accordance with procedural requirements.
3 Present evidence.	3.1 ***Rules of evidence***, procedures and ***protocols*** relevant to the jurisdiction involved are observed and adhered to throughout proceedings.
	3.2 Personal presentation, manner and language are consistent with court protocols.
	3.3 Evidence is admissible and presented in a clear, concise and unambiguous manner and complies with rules of evidence.
	3.4 Specialist opinion within own level of qualification and expertise is provided on request in accordance with organisational procedures.
	3.5 Outcomes of proceedings and associated documentation and evidence are noted, filed and stored in accordance with legislative requirements.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- adhere to court protocols and procedures
- check and review documentation for accuracy, spelling and grammar
- communicate effectively with people from different social, cultural and ethnic backgrounds and of varying physical and mental abilities
- communicate verbally and non-verbally in a clear and concise manner
- identify and comply with applicable legal and procedural requirements, including licensing requirements
- identify relevant and valid information as admissible evidence
- maintain, store and preserve evidence
- prepare documentation using appropriate structure and language
- read, analyse and interpret information
- record and accurately report information
- research, select and organise information
- select and use information technology appropriate to task
- store and preserve evidence
- use a range of business equipment and technology appropriate to meet task requirements.
- verify validity of information
- write reports using formal structure and language.

Required knowledge

- briefing, documentation and preparation requirements
- court protocols and procedures relevant to the jurisdiction
- document and evidence management systems
- evidence preparation and presentation requirements
- general principles regarding the admissibility of evidence in courts
- organisation policies and procedures relating to own role and responsibilities and providing specialist opinion
- principles of effective communication
- privacy and confidentiality requirements
- procedures for handling and managing evidential exhibits
- relevant industry codes of practice and legislation including 'rules of evidence' and 'continuity of evidence'
- requirements for handling and managing evidential exhibits
- storage requirements for information that is susceptible to spoil or damage (film, computer tapes)
- techniques to verify and validate information.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- sourcing, organising and confirming validity of information
- following up outcomes of proceedings and feedback, reviewing implications as the basis for appropriate actions to be implemented
- managing and storing evidence and material to ensure its preservation, and completing relevant documentation in compliance with applicable legislation and licensing requirements
- presenting evidence in a clear, concise and unambiguous manner and, as required, providing specialist opinion within own level of qualification and expertise
- researching and selecting information that is determined relevant and valid for use as admissible evidence in a judicial or quasi-judicial environment
- understanding and complying with court protocols, legislative and procedural requirements including appropriate use of communication and language.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements, performance criteria and range statement.

Resource implications for assessment include:

- access to plain English version of relevant statutes and procedures
- access to a registered provider of assessment services
- access to a suitable venue and equipment
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include

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access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

This unit of competency could be assessed using the following methods of assessment:

- observation of processes and procedures
- questioning of underpinning knowledge and skills.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Legislative requirements may relate to:

- apprehension and powers of arrest
- Australian standards and quality assurance requirements
- counter-terrorism
- crowd control and control of persons under the influence of intoxicating substances
- force continuum, use of force guidelines
- general 'duty of care' responsibilities
- inspection of people and property, and search and seizure of goods
- licensing or certification requirements
- privacy and confidentiality

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- relevant commonwealth, state, territory legislation, codes and national standards for:
  - anti-discrimination
  - cultural and ethnic diversity
  - environmental issues
  - equal employment opportunity
  - industrial relations
  - Occupational Health and Safety (OHS)
- relevant industry codes of practice
- trespass and the removal of persons
- use of restraints and weapons:
  - batons
  - firearms
  - handcuffs
  - spray.

Organisational requirements may relate to:

- access and equity policies, principles and practices
- business and performance plans
- client service standards
- code of conduct, code of ethics
- communication and reporting procedures
- complaint and dispute resolution procedures
- emergency and evacuation procedures
- employer and employee rights and responsibilities
- OHS policies, procedures and programs
- own role, responsibility and authority
- personal and professional development
- privacy and confidentiality of information
- quality assurance and continuous improvement processes and standards
- resource parameters and procedures
- roles, functions and responsibilities of security personnel
- storage and disposal of information.

Evidence may include:

- audio or video recordings
- charts
- documents
- drawings
- facts
- photographs or images
- physical items (eg specimens, samples)
- statements
- testimonies.

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Relevant information may relate to:

- admissible evidence
- computer-based information
- data
- original and back-up video or audio tapes
- original, copy or negative film or photographs
- physical items
- precedents
- records of interview
- reports or documentation
- specimens and samples
- tape recordings
- witness statements.

Evidence management may involve:

- constant reviews during an investigation
- continuity of possession
- labelling
- protection and storing of evidence
- referral to prosecution organisations at any stage
- systematic recording such as dating and numbering
- using written or electronic database systems.

***Courts* may include**:

- criminal, coronial and civil
- district
- federal
- Human Rights and Equal Opportunity Commission
- Industrial Relations Commission
- Land and Environment Court
- local
- magistrates
- Royal Commissions
- supreme
- tribunals.

***Court arrangements* may relate to**:

- confirmation of evidence requirements
- date, location and time of proceedings
- documentation requirements.

***Relevant persons* may include**:

- clients
- colleagues
- judicial representatives
- legal representatives
- police
- supervisor.

***Documentation and exhibits* may relate to**:

- affidavits
- items of evidence

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- media footage
- photographs
- radio and telephone records or logs
- reports
- reports of incidents
- transcripts of conversation.

***Rules of evidence* may involve**:

- admissibility
- contemporaneousness.

Court *protocols* may relate to:

- examination and cross-examination procedures
- forms of address
- general demeanour
- impartiality
- punctuality
- readiness of self and evidence
- respect for people and offices held
- standards of dress, physical appearance
- voice clarity and language.

Unit Sector(s)

Unit sector Security

Competency field

Competency field Operations

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CPPSEC5003A Assess security risk management options

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to assess options for the management of security risk in an organisational environment. It requires the ability to compare treatment options against identified security risks, rank suitable treatment options, and prepare and present recommended options and supporting analysis.

This unit may form part of the licensing requirements for persons engaged in risk assessment operations in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has application in those work roles involving the assessment of security risks in an organisational environment. Competency requires legal and operational knowledge applicable to relevant sectors of the security industry. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Determine security risk.	1.1 Applicable provisions of ***legislative*** and ***organisational requirements***, and ***relevant standards*** for assessment activities are identified and complied with.
	1.2 Type and nature of ***security risks*** are determined based on an accurate and current assessment of the client's ***operating environment*** and core business operations.
	1.3 Security risks are ranked in terms of degree of risk and linked to potentially suitable ***treatment options***.
	1.4 Degree of risk is determined by an assessment of current and valid data.
2 Identify and assess treatment options.	2.1 Treatment options are identified and confirmed to be commensurate with the identified type, ***nature and cause*** of security risk.
	2.2 Treatment options applied in a similar context are researched and assessed for effectiveness against documented and ***verifiable evidence***.
	2.3 ***Criteria*** for assessment of risks against treatment options are consistent with recognised industry practice and relevant standards.
	2.4 Treatment options appropriate to the full range of potential security risks are selected and prioritised according to established criteria.
3 Review and present findings.	3.1 A report outlining assessment findings and recommended treatment options is prepared and ***presented*** to relevant persons.
	3.2 Analysis and recommendations are clear, coherent and consistent with ***terms of reference*** and supported by verifiable evidence.
	3.3 Advice outlining possible consequences of not implementing recommended treatment options is included in the analysis.
	3.4 Effective ***interpersonal techniques*** and presentation procedures are used to enhance understanding and acceptance of recommended treatment options.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- accurately determine identified risks and threats
- apply reasoning and logical analysis in assessment processes
- assess risks and threats
- coaching and mentoring to provide support to colleagues
- collate numerical data
- communicate in a clear and concise manner
- determine suitability of treatment option against security risk
- determine type and nature of security risks
- identify and assess assets
- prepare and present verbal and written reports
- prioritise tasks and organise schedules
- prioritise treatment options in terms of degree of security risk
- provide written communication to a standard required for compiling reports and summarising information
- relate to persons of different social and cultural backgrounds and varying physical and mental abilities
- research and analyse information
- source and access information
- use a variety of problem-solving techniques
- use business and information technology.

Required knowledge

- applicable Australian standards, industry codes of practice and legislation including Occupational Health and Safety (OHS)
- basic understanding of insurance in terms of acceptable risks, premium ranges and liabilities
- client's operating environment and business operations
- concept of integrated security measures including physical security; information technology security, and security of personnel and information
- concept of litigation
- current security systems and technologies available expertise
- distinction between information and intelligence
- preparation of documentation and presentation procedures
- principles of basic statistics and numeracy
- principles of effective communication
- principles of AS/NZS 4360: 2004 Risk management and related guidelines
- privacy and confidentiality requirements
- relevant industry codes of practice

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REQUIRED SKILLS AND KNOWLEDGE

- relevant legislation and regulations including licensing requirements
- risk assessment techniques
- types of treatment options appropriate to the range of security risks and threats applicable to premises and businesses.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of understanding and knowledge of the following:

- evaluating risks against developed criteria and selecting treatment options commensurate with the level and nature of potential risks based on the principles of AS/NZS 4360: 2004
- identifying the nature, cause and range of potential security risks to client based on an assessment of valid and relevant data
- preparing and presenting an analysis and options related to management of security risks and using effective interpersonal skills to enhance client understanding and acceptance of recommendations.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements, performance criteria and range statement.

Resource implications for assessment include:

- access to a registered provider of assessment services
- access to a suitable venue and equipment
- access to plain English version of relevant statutes and procedures
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include access to modified equipment and other physical resources, and the

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provision of appropriate assessment support.

Method of assessment

This unit of competency should be assessed using questioning of underpinning knowledge and skills.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Legislative requirements may relate to:

- apprehension and powers of arrest
- Australian standards and quality assurance requirements
- counter-terrorism
- crowd control and control of persons under the influence of intoxicating substances
- force continuum, use of force guidelines
- general 'duty of care' responsibilities
- inspection of people and property, and search and seizure of goods
- licensing or certification requirements
- privacy and confidentiality
- relevant commonwealth, state and territory legislation, codes and national standards for:
  - anti-discrimination

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- cultural and ethnic diversity
- environmental issues
- equal employment opportunity
- industrial relations
- OHS
- relevant industry codes of practice
- trespass and the removal of persons
- use of restraints and weapons:
  - batons
  - firearms
  - handcuffs
  - spray.

Organisational requirements may relate to:

- access and equity policies, principles and practices
- business and performance plans
- client service standards
- code of conduct, code of ethics
- communication and reporting procedures
- complaint and dispute resolution procedures
- emergency and evacuation procedures
- employer and employee rights and responsibilities
- OHS policies, procedures and programs
- own role, responsibility and authority
- personal and professional development
- privacy and confidentiality of information
- quality assurance and continuous improvement processes and standards
- resource parameters and procedures
- roles, functions and responsibilities of security personnel
- storage and disposal of information.

Relevant standards:

- must include AS/NZS 4360: 2004 Risk management
- may relate to:
  - AS2630-1983 Guide to the selection and application of intruder alarm systems for domestic and business premises
  - HB 167:2006 Security Risk Management
  - HB 436 Risk Management Guidelines - Companion to AS/NZS 4360
  - HB 231:2000 Information security risk management guidelines
  - other standards relating to the treatment options as published and distributed by Standards Australia.

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Security risks may be:	• acceptable • across all aspects of operations • across limited number of operations • high likelihood • long-term • low likelihood • potentially avoidable • potentially unavoidable • short-term • unacceptable.
***Risk* relates to**:	• the chance of something happening that will have an impact on objectives.
Risks may relate to:	• break-ins • business operations • confidentiality • deliberate or accidental damage • finance • OHS • personnel • theft • threats of loss, harm or damage to persons or property • trespass • unauthorised access • vandalism • workplace environment.
Assessment of *operating environment* may relate to:	• competitors • core business functions • environmental issues • financial markets • industrial relations • market share • nature of operations • neighbours • scale of operations • situational issues • size • stability • stability of company, organisation, industry and market • stakeholders • type of industry • workforce.

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Security risk *nature and causes* may be:	• client-based • external • financial • internal • mechanical • operational • skill based.
***Treatment options* may relate to**:	• attendance • confidentiality • interventions • regularity of presence • rehearsals • surveillance.
***Verifiable evidence* may include**:	• incident reports • insurance data • official records • organisational data • video evidence • witness statements.
***Criteria* may include assessment of**:	• budgetary constraints • environmental issues • industrial relations • legal issues • nature of the task • operating environment of organisation • organisation structure • organisational image • political influences • terms of reference • timeframes.
***Presentation* may involve**:	• charts and statistical reports • computer equipment including data projectors • models • real-time demonstration • simulation • the use of audio and video.
***Terms of reference* may relate to**:	• client expectations • cost • limitations and exclusions of access to information • lines of authority • operational environment

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- roles and responsibilities
- scale of the assessment eg full-scale operation or limited to a particular section or operation of the company
- security and other clearances
- timeframe.

Interpersonal techniques may involve:

- active listening
- being non-judgemental
- being respectful and non-discriminatory
- constructive feedback
- control of tone of voice and body language
- culturally aware and sensitive use of language and concepts
- demonstrating flexibility and willingness to negotiate
- effective verbal and non-verbal communication
- maintaining professionalism
- providing sufficient time for questions and responses
- reflection and summarising
- two-way interaction
- use of plain English
- use of positive, confident and cooperative language.

Unit Sector(s)

Unit sector Security

Competency field

Competency field Security and risk management

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CPPSEC5004A Prepare security risk management plan

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to plan and prepare for security risks. It requires the ability to develop a security risk management plan which incorporates suitable strategies for risk identification and treatment, and contingency arrangements compatible to identified risk.

This unit may form part of the licensing requirements for persons engaged in security operations in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has wide application in a range of managerial roles in the security industry. Work is performed under minimal supervision and competency requires a high level of judgement and decision-making. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Evaluate security risks.	1.1 ***Security risks*** are identified and consequences interpreted in accordance with client, ***organisational*** and ***legislative requirements*** and ***relevant standards***. 1.2 Acceptable and unacceptable risks are clearly distinguished and confirmed. 1.3 High priority risks are emphasised and specified to ensure the development of appropriate ***controls***. 1.4 Existing controls are evaluated to determine impact on risk occurrence and required modifications identified.
2 Develop action plans.	2.1 Action plans are developed identifying key tasks, activities and resources to achieve security risk management objectives. 2.2 ***Type of risk*** associated with security context is identified and appropriate controls incorporated into planning processes. 2.3 Communication and reporting arrangements for maintaining currency of action plans are established. 2.4 ***Contingency arrangements*** for actions are developed and incorporated into plans.
3 Design treatment options.	3.1 Operating environment monitored to confirm potential and real risks, threats and required treatments. 3.2 ***Treatment options*** are selected in line with available organisational practices, and implications researched, clarified and approved by ***relevant persons***. 3.3 Feasible treatment options are documented and costed to ensure compatibility with nature of risk and client requirements. 3.4 Treatment options are linked to whole or part of security risks and verified with clients for suitability to security context. 3.5 ***Tests*** on treatment options are conducted to determine applicability in the field, and results statistically analysed to confirm effectiveness of treatments.
4 Develop security risk management plan.	4.1 ***Management requirements*** are identified and accounted for in development of security risk management plan. 4.2 Procedures for monitoring and review of security risk management activities are developed to ensure continuous improvement. 4.3 Security risk management plan is developed incorporating all ***relevant information*** in line with appropriate ***format*** and relevant standards.

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ELEMENT	PERFORMANCE CRITERIA
	4.4 Plan is finalised and presented to client for review and approval in accordance with organisational procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- access and use workplace information
- active listening
- adapt personal communication style to a variety of situations
- analyse and evaluate information and data
- coaching and mentoring to provide support to colleagues
- collate numerical data
- communicate in a clear and concise manner
- design treatment options and tests
- negotiation
- numeracy skills to calculate resources and costings
- planning
- reading to interpret complex information
- relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- solve problems to deal with complex and non routine difficulties
- use technology to research, analyse and report information
- writing to develop complex reports.

Required knowledge

- applicable Occupational Health and Safety (OHS) licensing and legislative compliance requirements
- application of the hierarchy of control
- approved communication terminology and call signs
- available support agencies and the types of services offered
- basic methods for statistical analysis and presentation of statistical data
- difference between negative and positive language
- differences between written and spoken English
- how to read and use body language to gain confidence of others
- how to record information which may be used for legal purposes
- how to safeguard confidential information

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REQUIRED SKILLS AND KNOWLEDGE

- how to use business equipment to present information
- negotiation techniques
- OHS implications relating to use of guard dogs, apprehension or arrest of persons, use of firearms, use of restraints, handcuffs, batons and spray
- organisational standards for the presentation and maintenance of written information
- principles of AS/NZS 4360: 2004 Risk management
- risk management principles and practices
- sources of supply of security equipment or systems
- tactical response measures
- use of force guidelines.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- identifying and evaluating security risks and control measures in compliance with client, organisational and legislative requirements
- designing and developing effective action plans which incorporate strategies for treating risks, contingency arrangements, key tasks and resources, and communication and reporting
- designing and testing risk treatment options which are compatible with nature of risk and client requirements, and conducting an analysis of the results to confirm effectiveness of treatments
- developing a comprehensive risk management plan in an appropriate format which incorporates a broad range of relevant information, considers implementation issues, and incorporates continuous improvement mechanisms based on the principles of AS/NZS 4360:2004.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements,

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performance criteria and range statement.

Resource implications for assessment include:

- access to a registered provider of assessment services
- access to a suitable venue and equipment
- access to plain English version of relevant statutes and procedures
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

This unit of competency should be assessed using questioning of underpinning knowledge and skills.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Security risks may

- biological hazards
- chemical spills

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relate to:

- client contact
- electrical faults
- explosives
- financial viability
- injury to personnel
- noise, light, heat, smoke
- persons carrying weapons
- persons causing a public nuisance
- persons demonstrating suspicious behaviour
- persons suffering from emotional or physical distress
- persons under the influence of intoxicating substances
- persons with criminal intent
- persons, vehicles and equipment in unsuitable locations
- property or people
- security systems
- suspicious packages or substances
- systems or process failures
- terrorism
- violence or physical threats.

***Risk* relates to**:

- the chance of something happening that will have an impact on objectives.

Organisational requirements may relate to:

- client service standards
- implementation of OHS system
- policies for ensuring privacy and confidentiality of information
- procedures for archiving electronic and hard-copy records
- procedures for recording, storing and destroying information
- standard of language, literacy and numeracy required
- use of organisational equipment and resources.

Legislative requirements may relate to:

- anti-discrimination and diversity
- Australian standards, codes of practice and regulations
- award and enterprise agreements
- duty of care
- evidence collection
- licensing arrangements and certification requirements
- OHS issue resolution
- relevant commonwealth, state and territory OHS legislation, codes of practice and regulations
- roles and responsibilities of OHS representatives and committees
- trade practices

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- use of force.

Relevant standards:

- must include AS/NZS 4360: 2004 Risk management
- may relate to:
  - AS2630-1983 Guide to the selection and application of intruder alarm systems for domestic and business premises
  - HB 167:2006 Security Risk Management
  - HB 436 Risk Management Guidelines - Companion to AS/NZS 4360
  - HB 231:2000 Information security risk management guidelines.

***Controls* may include**:

- communication
- deployment of specialist expertise or equipment
- development of procedures
- monitoring and surveillance
- physical attendance and security
- staff ratios and resource deployment
- training of personnel.

Type of risk may be:

- intermediate
- likely to occur
- major
- minor
- physical
- potentially avoidable
- potentially unavoidable
- property related
- unlikely to occur.

***Contingency arrangements* may include**:

- approvals and licenses
- availability of additional resources
- background information
- back-up
- checklists and reporting
- identification requirements
- instructions.

***Project planning requirements* may include**:

- key outcomes
- milestones
- personnel involvement
- resources
- tasks
- timelines.

Treatment options

- controlled interruptions to normal operations

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may include:	• exercises • information collation and analysis • simulations • surveillance • verification requirements.
***Relevant persons* may include**:	• authorities • client • managers • technical specialists.
***Tests* may include**:	• alarms and other warning devices • exercises • inspections • interviews • rehearsals • simulations.
***Management requirements* may relate to**:	• adherence to organisational policies and procedures • allocation of suitable resources and expertise • feedback and monitoring arrangements • preparation of documentation and checklists • procedures to maximise safety of operatives • project planning • reporting procedures and timeframes • risk management timelines and objectives specified in action plans.
***Relevant information* may include**	• action plans • backup systems or processes • contingency plans • details and results of testing and relevant statistical analysis • identified assets • identified management requirements • implementation issues • operational issues • resource requirements including allocation and location of resources • review and monitoring procedures • risk assessment • supporting evidence • threat assessment • treatment options and strategies linked to risks and threats.

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***Format* may relate to**:

- accuracy
- common industry terminology
- enclosures and attachments
- length
- sequence of coverage
- style
- use of abbreviations
- use of appendices
- use of plain English.

Unit Sector(s)

Unit sector Security

Competency field

Competency field Security and risk management

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CPPSEC5005A Implement security risk management plan

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to facilitate implementation of a security risk management plan. It requires the ability to allocate roles and responsibilities, coordinate and monitor implementation procedures, and evaluate the effectiveness of treatment options.

This unit may form part of the licensing requirements for persons engaged in risk assessment operations in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has wide application in a range of managerial roles in the security industry. Work is performed under minimal supervision and competency requires a high level of judgement and decision-making. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Organise functions and tasks.	1.1 Applicable provisions of ***legislative*** and ***organisational requirements***, and ***relevant standards*** for ***risk*** assessment activities are identified and complied with.
	1.2 ***Roles and responsibilities*** associated with the implementation of the security risk management plan are clearly defined and articulated to ***relevant persons***.
	1.3 ***Activities*** and targets are linked to achievement of milestones and outcomes in project action plans.
	1.4 ***Resources***, ***equipment and materials*** to assist plan implementation are suitable to project purposes and available within specified timelines.
	1.5 Information related to the implementation of the plan is accurately and promptly distributed using established communication channels.
	1.6 Confidentiality requirements are confirmed and maintained in accordance with client and organisational requirements.
2 Monitor risk context.	2.1 Emerging risks or threats to assets are monitored and assessed to maintain ongoing suitability of implemented security risk ***treatment options***.
	2.2 Changes to operating environment are monitored and corrective measures determined and incorporated into the plan as required.
	2.3 ***Targets and outcomes*** are regularly reviewed and evaluated to ensure achievement of ***project aims*** based on relevant standards.
	2.4 Existence and occurrence of risks are accurately and comprehensively documented providing an assessment of the type, nature and cause.
	2.5 Application of contingencies and corrective measures are accurately documented.
3 Review effectiveness of treatment options.	3.1 Long and short-term options are costed to ensure an accurate estimate of resources is allocated to support the plans.
	3.2 Discrepancies between treatment options and risk incidence are monitored and addressed through appropriate modifications to plans.
	3.3 Stages of implementation are identified and resources and options are coordinated to ensure access and availability.
	3.4 Corrective measures are developed, tested and incorporated into the risk management plan.

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ELEMENT	PERFORMANCE CRITERIA
	3.5 Feedback on effectiveness of treatment options is sought and provided to relevant personnel.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- allocate work tasks and functions
- coaching and mentoring to provide support to colleagues
- collate and analyse numerical data
- communicate in a clear and concise manner
- delegate roles and responsibilities
- determine suitability of treatment option against security risk
- determine type and nature of security risks and threats
- manage projects
- monitor implementation procedures
- monitor risk context and identify emerging risks or threats to assets
- prepare and present verbal and written reports
- prioritise tasks and organise schedules
- prioritise treatment options in terms of degree of security risk
- provide written communication to a standard required for compiling reports and summarising information
- relate to persons of different social and cultural backgrounds and varying physical and mental abilities
- research and analyse data and information
- summarise information
- use a variety of problem-solving techniques
- use business equipment and technology.

Required knowledge

- availability and capability of project management software
- concept of integrated security measures including physical security; information technology security, and security of personnel and information
- current security systems and technologies and available expertise
- operating environment and business operations
- preparation of documentation procedures
- principles of effective communication

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REQUIRED SKILLS AND KNOWLEDGE

- principles of AS/NZS 4360: 2004 Risk management and related guidelines
- privacy and confidentiality requirements
- process of security risk management
- relevant legislation and regulations including licensing requirements
- risk assessment techniques and processes
- sources of supply of security equipment and systems
- types of treatment options appropriate to the range of security risks and threats applicable to premises and businesses.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- monitoring emerging risks to ensure ongoing suitability of risk management plan based on principles of AS/NZS 4360: 2004
- efficient allocation of resources to support risk management plan
- effectively communicating designated roles, responsibilities and work schedules to security personnel
- preparing documentation and guidelines with a clear explanation of the incidence, nature and causes of risks and appropriate contingency arrangements
- systematically reviewing the effectiveness of treatment options and making appropriate modifications as required to address any discrepancies between treatment options and risk incidence.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements, performance criteria and range statement.

Resource implications for assessment include:

- access to a registered provider of assessment services
- access to a suitable venue and equipment
- access to plain English version of relevant statutes and

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procedures
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

This unit of competency should be assessed using questioning of underpinning knowledge and skills.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Legislative requirements may relate to:

- apprehension and powers of arrest
- Australian standards and quality assurance requirements
- cabling
- counter-terrorism
- crowd control and control of persons under the influence of intoxicating substances
- Force continuum, use of force guidelines

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- general 'duty of care' responsibilities
- inspection of people and property, and search and seizure of goods
- licensing or certification requirements
- privacy and confidentiality
- relevant commonwealth, state and territory legislation, codes and national standards for:
  - anti-discrimination
  - cultural and ethnic diversity
  - environmental issues
  - equal employment opportunity
  - industrial relations
  - Occupational Health and Safety (OHS)
- relevant industry codes of practice
- surveillance
- telecommunications
- trespass and the removal of persons
- use of listening and recording devices
- use of restraints and weapons:
  - batons
  - firearms
  - handcuffs
  - spray.

Organisational requirements may relate to:

- access and equity policies, principles and practices
- business and performance plans
- client service standards
- code of conduct, code of ethics
- communication and reporting procedures
- complaint and dispute resolution procedures
- emergency and evacuation procedures
- employer and employee rights and responsibilities
- OHS policies, procedures and programs
- own role, responsibility and authority
- personal and professional development
- privacy and confidentiality of information
- quality assurance and continuous improvement processes and standards
- resource parameters and procedures
- roles, functions and responsibilities of security personnel
- storage and disposal of information.

Relevant standards:

- must include AS/NZS 4360: 2004 Risk management

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- may relate to:
  - AS2630-1983 Guide to the selection and application of intruder alarm systems for domestic and business premises
  - HB 167:2006 Security Risk Management
  - HB 436 Risk Management Guidelines - Companion to AS/NZS 4360
  - HB 231:2000 Information security risk management guidelines.

***Risk* relates to**:

- the chance of something happening that will have an impact on objectives.

Security risks may relate to:

- biological hazards
- chemical spills
- client contact
- electrical faults
- explosives
- financial viability
- injury to personnel
- noise, light, heat, smoke
- persons carrying weapons
- persons causing a public nuisance
- persons demonstrating suspicious behaviour
- persons suffering from emotional or physical distress
- persons under the influence of intoxicating substances
- persons with criminal intent
- persons, vehicles and equipment in unsuitable locations
- property or people
- security systems
- suspicious packages or substances
- systems or process failures
- terrorism
- violence or physical threats.

Roles and responsibilities may relate to:

- administrative support
- backup operational role
- decision-making
- frontline role
- team leadership
- team membership.

Relevant persons may include:

- client
- colleagues
- human resources personnel
- management

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Activities may include:	• security personnel. • advising • field work • monitoring • organising • report preparation • reporting.
Resources, equipment and materials may relate to:	• consumables • equipment • funding • personnel • time • vehicles.
***Treatment options* may relate to**:	• controlled interruptions to normal operations • exercises • information collation and analysis • simulations • surveillance • verification requirements.
***Targets and outcomes* may relate to**:	• client support times • effective security risk management • incident reports • level of feedback from clients • number of new sales • police liaison • response times.
***Project aims* may relate to**:	• key outcomes • milestones • personnel involvement • resources • tasks • timelines.

Unit Sector(s)

Unit sector	Security

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Competency field

Competency field Security and risk management

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CPPSEC5006A Determine strategy for the implementation of biometric technology

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to determine requirements and processes for the strategic implementation of biometric technology in the workplace.

It requires the ability to determine security and biometric technology requirements, design treatment options and develop an implementation strategy for the integration of a biometrics system.

An understanding of the operating principles of biometric systems including software, hardware and acquisition devices is also required as well as the ability to interpret and apply effective principles and requirements relating to confidentiality, privacy and security in own work.

This unit may form part of the licensing requirements for persons engaged in security operations involving biometric technology in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has application in those roles involving determining requirements for biometric technology in the workplace to maintain security. Competency requires legal and operational knowledge applicable to relevant sectors of the security industry. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Determine security requirements.	1.1 Applicable ***Occupational Health and Safety*** (***OHS***), ***legislative*** and ***organisational requirements*** relevant to workplace ***biometric technology*** are identified and complied with. 1.2 Relevant ***privacy legislation*** and codes of ethics relevant to the workplace application of biometric technology are accessed and interpreted. 1.3 Reliability and effectiveness of organisational ***security safeguards*** are evaluated. 1.4 ***Threats*** to organisational physical and technical security are identified. 1.5 ***Risks*** are identified and risk levels established and prioritised. 1.6 Effective ***communication*** and ***interpersonal techniques*** are used that reflect sensitivity to individual ***social and cultural differences***. 1.7 Specialist assistance to examine and assess security requirements is sought as required in accordance with organisational requirements.
2 Determine requirements for implementing biometric technology.	2.1 Legislative and regulatory requirements applicable to the use of biometric technology are confirmed. 2.2 ***Options*** for single or ***multiple*** biometric technology are determined. 2.3 Physical and technical specifications of ***biometric equipment and systems*** to be installed are determined. 2.4 Workspace requirements are identified and locations determined. 2.5 ***Resources***, skills and training requirements for the implementation of biometric technology are determined. 2.6 ***Existing architecture*** is assessed for effective integration with biometric technology and ***additional requirements*** determined.
3 Design implementation options.	3.1 Implementation options are selected in accordance with industry practices and organisational policies and procedures. 3.2 Implementation options are ***feasible*** and verifiable in accordance with organisational requirements. 3.3 Implementation options are in compliance with time schedules, available resources and budgetary guidelines. 3.4 Implementation options take into account organisational risk assessment and security requirements.

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ELEMENT	PERFORMANCE CRITERIA
	3.5 Implementation options are effective and applicable in the workplace.
4 Develop an implementation strategy.	4.1 All ***relevant information*** is collated, documented and presented in an ***appropriate format*** in accordance with organisational requirements.
	4.2 ***Implementation strategy*** is developed in accordance with organisational requirements.
	4.3 Strategy incorporates ***contingencies*** and allows for continuous improvement planning.
	4.4 Strategy is presented to ***relevant persons*** and feedback is sought and used to evaluate and refine strategy.
	4.5 ***Records and reports*** are completed and maintained in accordance with legislative and organisational requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- accurately and securely maintain records, reports and other workplace information
- analyse organisational security plans, goals, objectives and existing safeguards
- coaching and mentoring to provide support to colleagues
- comply with applicable confidentiality and privacy requirements
- comply with legislation, regulations, standards, codes of practice relevant to workplace biometric technology
- conduct and evaluate risk and threat assessments
- design effective treatment options
- determine biometric technology and system requirements, including single or multiple biometrics applications
- determine resources including personnel, tools and equipment
- determine security requirements
- make effective decisions
- plan for contingencies
- read and interpret technical information including plans, designs and specifications
- relate effectively to people from a range of social, cultural and ethnic backgrounds and varying physical and mental abilities
- research and analyse data and specifications

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REQUIRED SKILLS AND KNOWLEDGE

- resolve problems
- select and use equipment and technology appropriate to the work task
- undertake effective enrolment of biometric and biographical data
- use appropriate communication and interpersonal skills including negotiation
- written communication skills sufficient to complete relevant records and reports.

Required knowledge

- accuracy metrics and ratios according to risk tolerance
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice relevant to the full range of processes relating to workplace biometric technology
- appropriate mathematical procedures for estimating, measuring and calculating
- biometric technology installation and implementation processes, procedures and requirements
- ergonomic and safe working practices and procedures
- established threshold levels and their impact on security
- feasibility and cost-benefit analysis techniques
- initial enrolment processes
- management of enrolment data
- operating systems and integration application requirements
- operational principles of information technology
- organisational procedures for recording, reporting and maintaining workplace information
- organisational security plans, goals and objectives
- organisational standards, requirements, policies and procedures for the use of biometric technology
- principles of cultural diversity and access and equity
- privacy and ethics issues associated with biometric technology
- product options for various biometric systems
- risk, threats and vulnerabilities associated with biometric technology
- security and risk assessment and management techniques and processes
- types, functions and parameters of biometric technology including software, hardware and acquisition devices
- workplace communication channels, protocols and procedures.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the

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performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- accurately estimating resources to support implementation strategy and determining roles, responsibilities and work schedules
- complying with applicable legislation and codes of ethics applicable to privacy and client confidentiality
- complying with organisational policies and procedures, including OHS, relevant to biometric work tasks
- designing treatment options which are compatible with assessed risk and security requirements
- determining biometric technology requirements based on an accurate evaluation of existing security controls, assets, and potential risks and threats
- developing an effective strategy which incorporates the implementation of treatment options, contingency arrangements, and resources for the effective implementation of biometric technology in a workplace environment.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements, performance criteria and range statement.

Resource implications for assessment include:

- access to a registered provider of assessment services
- access to a suitable venue and equipment
- access to plain English version of relevant statutes and procedures
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

This unit of competency could be assessed using the following methods of assessment:

- observation of processes and procedures
- questioning of underpinning knowledge and skills.

Guidance information

Assessment processes and techniques must be culturally

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for assessment

appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

***Occupational Health and Safety* (*OHS*) *requirements may relate to*:**

- controlling and minimising risks
- correct manual handling including shifting, lifting and carrying
- elimination of hazardous materials and substances
- identifying hazards
- safe use and operation of equipment including
  - business technology
  - first aid equipment
  - fire safety equipment
  - personal protective clothing and equipment
  - safety equipment
- safety procedures for the protection of self and others.

***Legislative requirements may relate to*:**

- Australian standards and quality assurance requirements
- award and enterprise agreements
- Compliance Policy Guidelines (CPGs)
- counter-terrorism
- general 'duty of care' responsibilities
- licensing or certification requirements
- privacy and confidentiality

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- relevant commonwealth, state and territory legislation, codes and national standards for:
  - anti-discrimination
  - cultural and ethnic diversity
  - environmental issues
  - equal employment opportunity
  - industrial relations
  - OHS
- relevant industry codes of practice
- telecommunications.

Organisational requirements may relate to:

- access and equity policies, principles and practices
- business and performance plans
- client service standards
- code of conduct, code of ethics
- communication and reporting procedures
- complaint and dispute resolution procedures
- emergency and evacuation procedures
- employer and employee rights and responsibilities
- environmental management including waste disposal, recycling and re-use guidelines
- OHS policies, procedures and programs
- own role, responsibility and authority
- personal and professional development
- privacy and confidentiality of information
- quality assurance and continuous improvement processes and standards
- resource parameters and procedures
- roles, functions and responsibilities of security personnel
- standard operating procedures
- storage and disposal of information
- use and maintenance of equipment and systems.

Biometric refers to:

- a measurable physical characteristic or personal behavioural trait used to recognise the identity or verify the identity of an individual.

Biometric technologies include:

- facial recognition
- fingerprint recognition
- hand geometry
- iris recognition
- retina recognition
- signature recognition
- vein recognition
- voice recognition.

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Privacy legislation may include:

- Commonwealth, State and Territory Privacy Acts
- national information privacy principles
- national privacy principles.

Security safeguards may be:

- administrative and include:
  - contingency plans (data back-up, disaster recovery, and emergency mode operation plans)
  - information access management (access authorisation, establishment and modification)
  - security awareness and training (awareness, virus protection, log-in success or failure, password management)
  - security incident procedures (report and response procedures)
  - security management (risk analysis and management)
- physical and include measures to protect information systems, buildings and equipment from natural and environmental hazards and unauthorised intrusions
- technical and include:
  - access control (user identification, emergency access procedures, automatic log-off, encryption and decryption)
  - audit control (logging, capturing data versions, times, sessions, workstations, events and user information)
  - transmission security (integrity controls, encryption).

Threats:

- are intentional or unintentional potential events that could compromise the security integrity of physical and technical organisational systems.

***Risk* relates to**:

- the chance of something happening that will have an impact on objectives.

***Risks* may relate to**:

- data and information
- personnel
- property.

Communication may be:

- face-to-face
- group interaction
- in Indigenous languages
- in languages other than English
- oral reporting
- participation in routine meetings
- reading independently
- recording of discussions
- speaking clearly and directly
- through the use of assistive technology

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	• via an interpreter • visual or written • writing to audience needs.
Interpersonal techniques may involve:	• active listening • being non-judgemental • being respectful and non-discriminatory • constructive feedback • control of tone of voice and body language • culturally aware and sensitive use of language and concepts • demonstrating flexibility and willingness to negotiate • effective verbal and non-verbal communication • maintaining professionalism • providing sufficient time for questions and responses • reflection and summarising • two-way interaction • use of plain English • use of positive, confident and cooperative language.
***Social and cultural differences* may relate to**:	• dress and personal presentation • food • language • religion • social conventions • traditional practices • values and beliefs.
***Options* may relate to**:	• enrolment advice • motivation to verify • tolerance for rejected attempts.
***Multiple* biometrics refers to**:	• a biometric system that integrates two ore more biometric technologies (facial and iris recognition, and multiple instances of a single biometric eg one, two or ten fingerprints).
Biometric equipment and systems are:	• automated systems able to capture a biometric sample from an individual person, extract biometric data from the sample, compare the data with one or more reference templates, determine the quality of a match, and indicate whether or not an identification or verification of identity has been achieved.

Biometric equipment and systems may include:	• acquisition devices:
	  • cameras (video, infrared-enabled video, single-image)
	  • chip or reader embedded in peripheral device
	  • microphones

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- optical scanners
- biometric servers
- hardware
- interconnecting infrastructure
- software:
  - server-based authentication software for biometric authentication and logging
  - software associated with acquisition devices.

Resource requirements may include:

- computer systems (hardware, software and infrastructure)
- equipment
- funding
- personnel
- time
- tools.

***Existing architecture* may include**:

- desktop PCs
- local area networks (LANs)
- mainframe systems
- servers
- websites
- wide area networks (WANs).

***Additional requirements* may relate to**:

- integration service requirements and interoperability
- upgrading or replacing the system or components of the system.

***Feasibility* may relate to**:

- economic and schedule feasibility
- operational feasibility
- technical feasibility.

***Relevant information* may include**:

- assets (resources, data and information)
- contingency plans
- implementation issues
- resource requirements including allocation and location
- risk and threat assessment outcomes
- treatment options.

Appropriate format may include:

- formats that cater for those with special needs for example, producing documents in large print.

Implementation strategy may include:

- analysis and comparison of biometrics system options
- assessment of security risks
- enrolment processes
- integration requirement and system interoperability
- resources necessary for implementation
- staged rollouts.

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Contingencies may detail:

- roles, responsibilities, teams and procedures associated with restoring a security system following a disruption
- side manual door entry.

***Relevant persons* may include**:

- biometric technology specialists
- clients
- colleagues
- external consultants
- information technology specialists
- manager.

Records and reports:

- may be:
  - computer-based
  - manual
  - other appropriate organisational communication system
- may detail:
  - biometric technologies and systems
  - organisational security requirements
  - resources requirements
  - risk assessment outcomes
  - technical data and specifications
  - timeframe and financial considerations.

Unit Sector(s)

Unit sector Security

Competency field

Competency field Biometrics

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CPPSEC5007A Assess biometric system

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to conduct an assessment of the application and operations of biometric technologies and systems in a workplace environment.

It requires the ability to determine security arrangements and requirements, measure and assess the operation, application and outcomes of biometric technologies and systems in terms of efficiency and effectiveness. It also involves the preparation and presentation of assessment results.

An understanding of the operating principles of biometric systems including software, hardware and acquisition devices, and principles of measurement and assessment are also required as well as the ability to interpret and apply effective principles and requirements relating to confidentiality, privacy and security in own work.

This unit may form part of the licensing requirements for persons engaged in security operations involving biometric technology in those states and territories where these are regulated activities.

Application of the Unit

Application of the unit

This unit of competency has application in those roles involving the assessment of biometric technologies and systems in the workplace. Competency requires legal and operational knowledge applicable to relevant sectors of the security industry. The knowledge and skills described in this unit are to be applied within relevant legislative and organisational guidelines.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge section and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan for assessment.	1.1 Applicable ***Occupational Health and Safety*** (***OHS***), ***legislative*** and ***organisational requirements*** relevant to ***biometric technologies and systems*** are confirmed.
	1.2 Relevant ***privacy legislation*** and codes of ethics relevant to the workplace application of biometric technology are accessed and interpreted.
	1.3 Context and purpose of assessment is determined and clarified with ***relevant persons*** as required.
	1.4 Organisational ***security requirements*** are determined.
	1.5 Resources relevant to assessment activities are determined and organised in accordance with workplace procedures.
	1.6 ***Assessment plan*** is constructed in accordance with client requirements and workplace procedures.
2 Conduct assessment.	2.1 Effective ***communication*** and ***interpersonal techniques*** are used that reflect sensitivity to individual ***social and cultural differences***.
	2.2 Integration of biometric systems with ***existing architecture*** is assessed.
	2.3 Operational functions of biometric technologies and systems are assessed.
	2.4 Application of single or ***multiple*** biometric technologies are assessed.
	2.5 Data and information is assessed and errors or deficiencies identified.
	2.6 Skills and training requirements for the use, operation and maintenance of biometric systems are determined.
3 Complete assessment.	3.1 Assessment results are analysed, accurately documented and prepared in an ***appropriate format*** in accordance with organisational requirements.
	3.2 Findings are presented to relevant persons in accordance with workplace procedures.
	3.3 Findings are supported by verifiable evidence in accordance with organisational requirements.
	3.4 Feedback is sought, received and used in a constructive manner.
	3.5 Recommendations or identified opportunities for ***system improvements*** are forwarded to relevant persons to inform future practice.
	3.6 ***Records and reports*** are completed and maintained in accordance with legislative and organisational requirements.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge and their level required for this unit.

Required skills

- accurately and securely maintain records, reports and other workplace information
- analyse organisational security plans, goals, objectives and existing safeguards
- assess data and information and identify errors or deficiencies
- assess the application, operation and outcomes of biometric technologies and systems
- coaching and mentoring to provide support to colleagues
- comply with applicable confidentiality and privacy requirements
- comply with legislation, regulations, standards, codes of practice relevant to workplace biometric systems
- conduct and evaluate risk and threat assessments
- conduct contingency planning
- design effective treatment options
- determine biometric technology and system requirements, including single or multiple biometric applications
- determine resource requirements including personnel, tools and equipment
- determine security requirements
- determine skills and training requirements
- make effective decisions
- read and interpret technical information including plans, designs and specifications
- relate effectively to people from a range of social, cultural and ethnic backgrounds and varying physical and mental abilities
- resolve problems
- select and use equipment and technology appropriate to the work task
- undertake effective enrolment of biometric and biographical data
- use appropriate communication and interpersonal skills including negotiation.
- written communication skills sufficient to complete relevant records and reports
- written communication skills sufficient to write assessment plan, document assessment results and complete relevant records and reports.

Required knowledge

- accuracy metrics and ratios according to risk tolerance
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice relevant to the full range of processes relating to workplace biometric systems

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REQUIRED SKILLS AND KNOWLEDGE

- appropriate mathematical procedures for estimating, measuring and calculating
- assessment methods and techniques
- biometric technology and systems installation and implementation processes, procedures and requirements
- ergonomic and safe working practices and procedures
- established threshold levels and their impact on security
- feasibility and cost-benefit analysis techniques
- initial enrolment processes
- management of enrolment data
- operating systems and integration application requirements
- operational principles of information technology
- organisational procedures for recording, reporting and maintaining workplace information
- organisational security plans, goals and objectives
- organisational standards, requirements, policies and procedures for the use of biometric systems
- principles of cultural diversity and access and equity
- privacy and ethics issues associated with biometric systems
- problem identification and resolution procedures
- product options for various biometric systems
- risk, threats and vulnerabilities associated with biometric technology
- security and risk assessment and management techniques and processes
- types, functions and parameters of biometric systems including software, hardware and acquisition devices
- workplace communication channels, protocols and procedures.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- complying with applicable legislation and codes of ethics applicable to privacy and client confidentiality
- complying with organisational policies and procedures, including OHS, relevant to biometric work tasks

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- determining security requirements based on an accurate assessment of existing security controls, assets, and existing and potential risks and threats
- determining skill and training requirements to support the application of biometric technologies and systems
- efficiently and effectively assessing the application, operation and outcomes of biometric technologies and systems, including an accurate assessment of data and information
- establishing purpose and context of assessment and plan, organising and coordinating assessment activities
- preparing and presenting assessment findings, seeking and reviewing feedback, and recommending opportunities for improvement to inform future practices.

Context of and specific resources for assessment

Context of assessment includes:

- a setting in the workplace or environment that simulates the conditions of performance described in the elements, performance criteria and range statement.

Resource implications for assessment include:

- access to a registered provider of assessment services
- access to a suitable venue and equipment
- access to plain English version of relevant statutes and procedures
- assessment instruments including personal planner and assessment record book
- work schedules, organisational policies and duty statements.

Reasonable adjustments must be made to assessment processes where required for people with disabilities. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

This unit of competency could be assessed using the following methods of assessment:

- observation of processes and procedures
- questioning of underpinning knowledge and skills.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and suitable to the language, literacy and numeracy capacity of the candidate and the competency being assessed. In all cases where practical assessment is used, it should be combined with targeted questioning to assess the underpinning knowledge.

Oral questioning or written assessment may be used to assess underpinning knowledge. In assessment situations where the candidate is offered a choice between oral questioning and written assessment, questions are to be identical.

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Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Occupational Health and Safety* (*OHS*) *requirements may relate to:

- controlling and minimising risks
- correct manual handling including shifting, lifting and carrying
- elimination of hazardous materials and substances
- identifying hazards
- safe use and operation of equipment including
  - business technology
  - first aid equipment
  - fire safety equipment
  - personal protective clothing and equipment
  - safety equipment
- safety procedures for the protection of self and others.

Legislative requirements may relate to:

- Australian standards and quality assurance requirements
- award and enterprise agreements
- Compliance Policy Guidelines (CPGs)
- counter-terrorism
- general 'duty of care' responsibilities
- licensing or certification requirements
- privacy and confidentiality
- relevant commonwealth, state and territory legislation, codes and national standards for:
  - anti-discrimination
  - cultural and ethnic diversity
  - environmental issues
  - equal employment opportunity
  - industrial relations

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	• OHS • relevant industry codes of practice • telecommunications.
Organisational requirements may relate to:	• access and equity policies, principles and practices • business and performance plans • client service standards • code of conduct, code of ethics • communication and reporting procedures • complaint and dispute resolution procedures • emergency and evacuation procedures • employer and employee rights and responsibilities • environmental management including waste disposal, recycling and re-use guidelines • OHS policies, procedures and programs • own role, responsibility and authority • personal and professional development • privacy and confidentiality of information • quality assurance and continuous improvement processes and standards • resource parameters and procedures • roles, functions and responsibilities of security personnel • standard operating procedures • storage and disposal of information • use and maintenance of equipment and systems.
Biometric refers to:	• a measurable physical characteristic or personal behavioural trait used to recognise the identity or verify the identity of an individual.
Biometric technologies include:	• facial recognition • fingerprint recognition • hand geometry • iris recognition • retina recognition • signature recognition • vein recognition • voice recognition.
Biometric systems are:	• automated systems able to capture a biometric sample from an individual person, extract biometric data from the sample, compare the data with one or more reference templates, determine the quality of a match, and indicate whether or not an identification or verification of identity has been achieved.
Biometric systems may	• acquisition devices

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include:

- cameras (video, infrared-enabled video, single-image)
- chip or reader embedded in peripheral device
- microphones
- optical scanners
- biometric servers
- hardware
- interconnecting infrastructure
- software
  - server-based authentication software for biometric authentication and logging
  - software associated with acquisition devices.

Privacy legislation may include:

- Commonwealth, State and Territory Privacy Acts
- national information privacy principles
- national privacy principles.

***Relevant persons* may include**:

- biometric technology specialists
- clients
- colleagues
- external consultants
- information technology specialists
- manager.

Security requirements may be:

- risk and threat assessments
  - auditability
  - authentication
  - integrity
  - privacy protection
  - recovery
- security objectives
  - auditability
  - authentication
  - integrity
  - privacy protection
  - recovery
- security safeguards
  - administrative (licensing, authorisations, contingency plans, information access management, security incident procedures, security management, security awareness and training)
  - physical (include measures to protect information systems, buildings and equipment from natural and environmental hazards and unauthorised intrusions)
  - technical (access control, audit control, transmission

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security).

***Assessment plan* may include**:

- enrolment requirements
- level of assessment
- measurement and testing details and methods
- necessary resources (eg number of tests)
- privacy and ethics requirements
- timelines.

Communication may be:

- face-to-face
- group interaction
- in Indigenous languages
- in languages other than English
- oral reporting
- participation in routine meetings
- reading independently
- recording of discussions
- speaking clearly and directly
- through the use of assistive technology
- via an interpreter
- visual or written
- writing to audience needs.

Interpersonal techniques may involve:

- active listening
- being non-judgemental
- being respectful and non-discriminatory
- constructive feedback
- control of tone of voice and body language
- culturally aware and sensitive use of language and concepts
- demonstrating flexibility and willingness to negotiate
- effective verbal and non-verbal communication
- maintaining professionalism
- providing sufficient time for questions and responses
- reflection and summarising
- two-way interaction
- use of plain English
- use of positive, confident and cooperative language.

***Social and cultural differences* may relate to**:

- dress and personal presentation
- food
- language
- religion
- social conventions
- traditional practices
- values and beliefs.

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***Existing architecture* may include**:	• desktop PCs • local area networks (LANs) • mainframe systems • servers • websites • wide area networks (WANs).
***Multiple* biometrics refers to**:	• a biometric system that integrates two ore more biometric technologies (facial and iris recognition, and multiple instances of a single biometric eg one, two or ten fingerprints).
Appropriate format may include:	• formats that cater for those with special needs for example, producing documents in large print.
***System improvements* may relate to**:	• backup systems • changes to biometrics settings • contingency plans • threshold levels.

Records and reports:	• may be:
	  • computer-based
	  • manual
	  • other appropriate organisational communication system
	• may detail:
	  • applications of biometric technologies and systems
	  • functional operations of biometric technologies and systems
	  • resource requirements
	  • risk and threat assessments
	  • security arrangements and additional requirements.

Unit Sector(s)

Unit sector Security

Competency field

Competency field Biometrics

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CUFANM301A Create 2D digital animations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to use industry-current software to create 2D animations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	This unit addresses basic 2D animation skills directed at developing animations for inclusion in interactive media products, short stand-alone animated sequences and basic games. A person in this role works closely with other members of a production team and reports to a senior animator, designer, director or producer. The short dynamic animations they produce may include audio components. Skills associated with 3D digital animation are covered in: • CUFANM302A Create 3D digital animations. More complex skills associated with 3D character animation, including animating facial expressions and lip syncing, are covered in: • CUFANM501A Create 3D digital character animation.

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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify animation requirements	1. Clarify ***2D animation*** requirements, including ***design specifications*** and storyboard in consultation with ***relevant personnel*** 2. Clarify target users/audience and requirements with regard to ***output formats*** and ***delivery platforms***
Generate and assess ideas	3. Review animations, artworks and other creative sources that may inspire design ideas 4. Obtain other relevant information that may influence design ideas 5. Generate a range of animation ideas that are technically feasible, respond to specifications and provide creative solutions to all design issues 6. Present animation ideas to relevant personnel using appropriate ***design techniques***
Plan approach	7. Assess the range of industry-current 2D ***animation software*** available to determine compatibility with design specifications 8. In consultation with relevant personnel, select the most appropriate 2D animation software for a given purpose 9. Evaluate initial design ideas and specifications against findings and discuss with relevant personnel to select final design concept
Produce animations	10. Apply basic ***screen principles***, ***visual design principles***, ***communication principles***, ***animation techniques*** and ***animation principles*** to produce animated sequences 11. Source and import, or generate sufficient quantity of key drawings to establish required actions 12. Combine animated objects to produce single sequences according to creative requirements and specifications 13. Integrate ***audio assets*** where necessary 14. Save and store animations using appropriate output file formats and standard naming conventions
Finalise animations	15. Review animations to assess creative solutions to design specifications, appropriateness to users/audience and technical feasibility 16. Discuss and confirm with relevant personnel additional requirements or modifications to overall designs or animations and undertake necessary amendments

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - interpret information in software user manuals and help features
  - work as a member of a project team, both independently on assignment and under direction
  - respond constructively to feedback received from other team members
- initiative and enterprise in the context of:
  - generating a range of feasible ideas for 2D animated sequences
  - visualising creative concepts
- technical skills sufficient to:
  - use appropriate software to develop 2D animations
  - produce hand-drawn sketches
  - apply the basic principles of screen, visual design and communication to produce 2D animations
  - create 2D animations in appropriate formats for a range of delivery platforms
  - manage files and directories using standard naming conventions and version control protocols
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members
  - basic understanding of the relationship between the technical and creative aspects and requirements of media projects
- basic animation techniques and principles
- basic screen principles
- principles of visual design and communication
- copyright clearance procedures
- OHS standards as they apply to use of computer and keyboard for periods of time

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• creation of a range of 2D digital animations that:
	  • meet specifications
	  • demonstrate the basic principles of screen, visual design and communication
	  • meet the technical requirements of at least two delivery platforms listed in the range statement
	  • satisfy client requirements
	• collaborative approach to work.

Context of and specific resources for assessment	Assessment must ensure: • access to a selection of resources, equipment and current industry-current software as listed in the range statement • where sound is integrated in the animated sequence, access to a range of suitable software to support the integration of sound and visual elements • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of 2D digital animations created by the candidate in response to specifications • written or oral questioning to test knowledge of visual design principles, communication principles, animation techniques and responsibilities of different members of a project team.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFANM302A Create 3D digital animations • CUFDIG301A Prepare video assets • CUFDIG304A Create visual design components.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
2D animations may include:	• basic games • buttons • characters • illustrations • logos • morphs • objects • puzzles • simulated sequences • text • titles and credits.

Design specifications may include:	• characters and objects
	• key frames
	• objects
	• references
	• samples
	• script
	• storyboard
	• technical specifications, including:
	  • output file format
	  • output file size
	  • operating system
	  • hardware specifications, including memory size, RAM
	  • delivery platform
	  • bandwidth
	  • media form.

Relevant personnel may include:	• art director • audio asset creator • designer • director • graphic artist

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RANGE STATEMENT	
	• instructional designer • navigation designer • producer • project manager • system support personnel • other technical and specialist personnel.
Output formats may include:	• DIR/DCR • FLA/SWF • GIF • HTML.
Delivery platforms may include:	• CD • DVD • film • games console • internet • kiosk • mobile phone • PDA (personal digital assistant) • video • other mobile devices.
Design techniques may include:	• digital illustrations of objects and characters • freehand sketches • storyboards • story trees.
Animation software may include:	• Director • Flash • Toon Boon Studio.
Screen principles may include:	• editing, including basic transitions • framing • lighting • montage • narrative • story-telling • style/genre.
Visual design principles may include:	• balance • composition • emphasis • focal point • movement

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RANGE STATEMENT	
	• perspective • proportion • scale • unity.
Communication principles may include:	• communicating the message • conveying meaning • meeting audience requirements • using functional components.
Animation techniques may include:	• acceleration/deceleration • audio integration • hinges and pivots • key frames and tweens • looping backgrounds • morphing/object exaggeration • motion paths • registration points • rotation • speed/motion blur.
Animation principles may include:	• key frames • motion • pacing/timing • point of view.
Audio assets may include:	• music • narration • sound effects.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - animation and digital effects

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Co-requisite units

Co-requisite units		

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CUFANM302A Create 3D digital animations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to animate simple 3D models and create 3D animations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	This unit requires the application of basic 3D animation skills to create animations for inclusion in interactive media products, short stand-alone animated sequences and basic games. At this level, animators are working with 3D digital models that have already been created. Animated sequences may include audio components. Animations are created using a range of industry-current software that is constantly evolving, so it is essential that people working in this area keep up to date with the latest software. This unit does not include techniques for stop-motion, cell-analogue and real time animation. Nor does it cover more sophisticated animation techniques used in film, television and high-end games. These are addressed in: • CUFANM501A Create 3D digital character animation • CUFANM502A Create 3D digital environments.

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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Clarify animation requirements	1. With reference to ***production documentation***, clarify ***3D animation*** requirements and ***design specifications*** in consultation with ***relevant personnel*** 2. Examine the models to be animated to determine the most appropriate ***animation techniques*** 3. Identify the ***file format*** and ***delivery platform*** for animated sequences 4. Identify ***factors*** that may influence animation design approach 5. In consultation with relevant personnel, clarify work flow sequences to ensure that production schedule deadlines are met
Plan approach	6. Research animations, artworks and other creative sources that may inspire visual design ideas 7. Generate a range of animation ideas that are technically feasible, respond to briefs and provide creative solutions to all design issues 8. Present animation ideas to relevant personnel using appropriate ***design techniques***. 9. Adjust approach to incorporate feedback and agree on final design concepts 10. Discuss and select 3D ***animation software*** with relevant personnel to ensure that animated sequences meet specified outcomes 11. Analyse ***audio assets*** supplied for animations as required
Produce animated sequences for review	12. Create 3D animations using animation techniques to suit design requirements 13. Apply basic ***animation principles***, ***screen principles***, ***visual design principles*** and ***communication principles*** 14. Apply real world camera techniques to virtual cameras used in 3D animation 15. Render completed animated sequences 16. Save and store animated sequences using appropriate output file formats, standard naming conventions and version control protocols 17. Present 3D animated sequences to relevant personnel for evaluation by agreed deadlines
Finalise animated	18. Review animated sequences to assess creative solutions to design briefs, appropriateness to users/audience and

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ELEMENT	PERFORMANCE CRITERIA
sequences	technical feasibility 19. Discuss and confirm with relevant personnel additional requirements or modifications and complete changes as required

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - work as a member of a production team, both independently on assignment and under direction
  - respond constructively to feedback received from other team members
  - complete workplace documentation
- conceptual and creative skills in the context of:
  - generating feasible ideas for animated sequences
  - having a feel for movement and timing in order to produce convincing animations
  - maintaining design integrity
- technical skills sufficient to:
  - use industry-current animation software to develop digitally animated sequences
  - apply the principles of basic screen, visual design and communication to produce 3D animated sequences
  - output 3D animated sequences in appropriate file formats for a range of delivery platforms
  - manage files and directories using standard naming conventions and version control protocols
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- roles and responsibilities of project team members in the relevant industry sector
- basic understanding of the stages in the production process from initial design through to finished product
- issues and challenges that arise in the context of creating 3D digital animations
- basic 3D digital animation techniques
- basic screen principles
- principles of animation
- principles of visual design and communication
- features of a range of delivery platforms

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REQUIRED SKILLS AND KNOWLEDGE
• OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• creation of 3D digital animated sequences that:
	  • demonstrate the principles of basic screen, visual design and communication
	  • meet the technical requirements of specific platforms
	  • satisfy the design brief and client requirements
	• collaborative approach to work
	• attention to detail
	• ability to meet production deadlines.

Context of and specific resources for assessment	Assessment must ensure: • access to a range of resources, equipment and current industry-current software as listed in the range statement • where sound is integrated in animated sequences, access to a range of suitable software to support the integration of sound and visual elements • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence, authenticated show reels and third-party workplace reports of on-the-job performance • critical analysis of a range of 3D digital animated sequences created by the candidate to determine ability to meet design requirements • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of

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EVIDENCE GUIDE	
	this unit • informal questioning and discussion, including response to feedback and diagnostics.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFANM303A Create 3D digital models • CUFDIG303A Produce and prepare photo images • CUFDIG304A Create visual design components • CUFSOU301A Prepare audio assets.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Production documentation may include	• animatics • brief • storyboard • technical specifications.
3D animations may include:	• 3D elements • 3D panoramas • basic games • buttons • characters • illustrations • logos • models • morphs/blend shapes • puzzles • simulated sequences • text • titles and credits.

Design specifications may include:	• characters and objects
	• key frames
	• objects
	• references
	• samples
	• script
	• storyboard
	• technical specifications, including:
	  • output file format
	  • version control protocols
	  • output file size
	  • operating system
	  • hardware specifications, including memory size, RAM
	  • delivery platform

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RANGE STATEMENT	
	• media form.
Relevant personnel may include:	• 3D modeller • 3D producer • animation director • audio asset creator • director • graphic artist/designer • instructional designer • lead animator • matte painter • system support personnel • other technical and specialist personnel.
Animation techniques may include:	• acceleration/deceleration • audio integration • dynamic simulation • hierarchies • hinges and pivot points • hybrid method • key frames • layered animation • looping backgrounds • morphing/object exaggeration • motion capture • motion paths • pose to pose animation • registration points • rotation • scripted animation • speed/motion blur • straight-ahead animation.
File formats may include:	• AAS • ACT • ANI • ANM • ANS • AVI • AWA • AWM • CEL • CFT

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RANGE STATEMENT	
	• CMV • DIR/DCR • FLA/SWF • FLC • FLI • FLX • GIF • HTML • IFF • JPEG • LWOB • M3D • MMM • MOV • MPEG • MWF • PNG • QTVR • SEC • TIFF • VAN • VUE.
Delivery platforms may include:	• CD • DVD • film • games console • internet • kiosk • mobile phone or device • PDA (personal digital assistant) • video.
Factors may include:	• budget • purpose of animation • resources • target audience • timelines.
Design techniques may include:	• digitally generated illustrations of objects and/or characters • freehand sketches • fully rendered hand-drawn illustrations

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RANGE STATEMENT	
	• story trees • storyboards.
Animation software may include:	• 3D Studio Max • Cinema 4D • Houdini • Lightwave • Maya • Motionbuilder • Soft Image - XSI.
Audio assets may include:	• music • narration • sound effects.
Animation principles may include:	• anticipation • asymmetry in body and facial poses • balanced poses • exaggeration • movement in arcs • overlapping actions and follow-through • pacing/timing • secondary actions • singularity of message • squash and stretch • staging • strong silhouette in poses • weight.
Screen principles may include:	• camera techniques • editing, including basic transitions • framing • lighting • montage • narrative • story-telling • style/genre.
Visual design principles may include:	• balance • composition • emphasis • movement • perspective • proportion

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RANGE STATEMENT	
	• scale • unity.
Communication principles may include:	• communicating the message • conveying meaning • meeting audience requirements • using functional components.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - animation and digital effects

Co-requisite units

Co-requisite units		

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CUFANM303A Create 3D digital models

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to create 3D digital models. This unit is a prerequisite for: • CUFANM401A Prepare 3D digital models for production. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	3D modellers working on relatively simple projects apply the skills and knowledge described in this unit. From reference material and established designs, they create 3D models using whatever software is applicable to the production. 3D models need to meet technical and design specifications, as well as being efficient, reliable, to scale, and easy to rig and animate. Modellers need to appreciate what will be required of their models in later stages of production because this can affect the work they produce. Close liaison with other team members is, therefore, important. Even though a senior modeller or technical director supervises the creation of models, people at this level are expected to work autonomously within clear guidelines. More complex skills associated with 3D digital modelling are covered in: • CUFANM401A Prepare 3D digital models for production.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Clarify work requirements	1. With reference to ***production documentation***, clarify ***requirements*** and ***purpose*** for 3D digital models 2. In consultation with ***relevant personnel***, clarify work flow sequences to ensure that ***production*** schedule deadlines are met 3. Select ***software*** that best suits the type of production and ***delivery platform*** for which 3D digital models are being created 4. Gather and analyse ***reference materials*** to help with visualisation of 3D models
Create 3D digital models	5. Use software features to block out models to determine correct proportions in relation to reference materials 6. Manipulate software features to apply basic lighting and shaders as required 7. Ensure that models' topology allows appropriate deformation, as required 8. ***Progressively refine*** and check ***integrity*** of models until they meet design requirements 9. Submit models to relevant personnel for comment on whether production requirements have been met and make final adjustments as required 10. Render and output models in required ***format*** and submit to relevant personnel by agreed deadlines 11. Make back-up copies of files and complete workplace documentation according to enterprise procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - work as a member of a production team, both independently on assignment and under direction
  - respond constructively to feedback received from other team members
  - complete workplace documentation
- technical skills sufficient to:
  - use industry-current software applications to create 3D models to specifications
  - manage files and directories using standard naming conventions and version control protocols
  - make back-up copies of files and store appropriately
- initiative and creativity in the context of visualising and accurately creating 3D digital models of a range of animate and inanimate objects
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- roles and responsibilities of project team members in the relevant industry sector
- basic understanding of the stages in the production process from initial design through to finished product
- issues and challenges that arise in the context of creating 3D digital models
- 3D digital modelling techniques
- strong sense of scale, form, weight and volume
- geometry as it applies to the creation of realistic 3D digital models
- features of a range of delivery platforms
- OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• creation of 3D digital models that:
	  • demonstrate efficient use of geometry and attention to detail
	  • meet design requirements
	• collaborative approach to work
	• ability to meet deadlines.

Context of and specific resources for assessment	Assessment must ensure: • access to a selection of industry-current software as listed in the range statement • access to simulated or real production situations that require the creation of 3D digital models • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of 3D digital models created by the candidate to determine ability to create models for different kinds of objects • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFANM302A Create 3D digital animations

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EVIDENCE GUIDE	
	• CUVDSP11A Research and apply techniques for illustrative work • CUVVSP16A Research and experiment with techniques to produce drawings.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Production documentation may include:	• animatics • brief • storyboard • technical specifications.
Requirements may include:	• assets for integration • collaboration with other team members • creative expectations • design specifications • output format • technical specifications • timelines.

Purpose of 3D digital models may be for:	• animations
	• digital simulations, e.g.:
	  • architectural models
	  • e-learning resources
	  • demonstration of processes and procedures.

Relevant personnel may include:	• 3D designer or concept artist • 3D modeller • art director • director • head of department • matte painter • producer • project manager • storyboard artist • supervisor • technical director • other technical/specialist personnel.
Production may include:	• animated productions • commercials • digital media products, e.g.: • simulations

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RANGE STATEMENT	
	• games • e-learning resources • virtual worlds/environments • documentaries • feature films • filmed events or performances • music video • short films • television productions.
Software may include:	• 3D, e.g.: • 3D Studio Max • Maya • Softimage • graphics, e.g.: • Photoshop • Illustrator.
Delivery platforms may include:	• broadcast television • CD • DVD • film • internet • Kiosk • mobile phone • PDA (personal digital assistant) • other digital devices.
Reference materials may include:	• books • concept drawings and designs • direct observation of actions to be simulated in 3D models • real object on which models are to be based • still images • videos.
Progressive refinements may include:	• achieving required shape • achieving required topology.
Aspects to be checked for ***integrity*** may include:	• double faces • isolated vertices • pivot points • resetting transform • scale of models relative to other components in

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RANGE STATEMENT	
	final sequences.
Formats may include:	• AVI • IFF • JPEG • MPEG • PNG • Quicktime • Targa • TIFF.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - Animation and digital effects

Co-requisite units

Co-requisite units		

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CUFANM402A Create digital visual effects

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to create digital visual effects. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	Compositors or effects artists working in 3D animation and graphics studios apply the skills and knowledge described in this unit. They are responsible for creating digital visual effects to simulate physical or natural phenomenon, such as fire, crowds, flocks of birds, fluids, smoke and weather conditions. They receive material from various sources, which could include bluescreen elements, particles, graphics, 2D and 3D animation, and live action footage. Their job is to creatively combine elements into the final image, ensuring that the established style of the project is respected and continuity is maintained. Typically, their briefs are based on elements of storyboards for film, television or digital media productions, including games. A high level of creativity is required, along with proficiency in using a range of industry-current software applications to create and refine digital visual effects. A collaborative approach to work within a production team is essential, as is an ability to meet deadlines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Clarify work requirements	1. With reference to ***production documentation***, clarify ***requirements*** for ***digital visual effects*** 2. In consultation with ***relevant personnel***, clarify work flow sequences to ensure that production schedule deadlines are met 3. Select ***software*** that best suits the type of ***production*** and ***delivery platform*** for which visual effects sequences are being created 4. Gather and analyse ***reference material*** to help with visualisation of final sequences
Prepare components	5. Gather all ***assets*** for integration and check that they are in the correct ***output file format*** 6. Choose digital visual effects that best represent the vision of scripts, as required 7. Check that components comply with storyboard requirements 8. Determine the appropriate ***methods and techniques*** to be used for the production of the required digital special effects
Assemble previsualisations	9. Create previsualisation of the required visual effects sequences using the appropriate assets and ***compositing techniques*** 10. Experiment with previsualisation to establish the best results and solve problems that arise during the process of creating the visual effects 11. Submit previsualisation visual effects sequences to relevant personnel for evaluation and feedback 12. Match elements as required, such as colour, lighting and camera
Produce visual effects	13. Create final visual effects 14. Generate additional required effects to final stage 15. Render visual effects to desired format 16. Submit visual effects sequences to relevant personnel for evaluation and feedback by agreed deadlines
Finalise visual effects	17. Respond to feedback by making adjustments to visual effects so that they comply with design and production specifications 18. Save files to specified storage system accessible to production team

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ELEMENT	PERFORMANCE CRITERIA
	19. Make back-up copies of visual effects in accordance with enterprise procedures 20. Complete workplace documentation as required 21. Review process of creating digital visual effects and note areas for future improvement

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - interpret storyboards
  - work collaboratively in a team environment, both independently and under direction
  - respond constructively to feedback received from other team members
  - complete workplace documentation
- technical skills sufficient to:
  - use common features of industry-current compositing and visual effects software
  - produce digital visual effects for a range of output formats
  - manage files and directories using standard naming conventions and version control protocols
- initiative and creativity in the context of:
  - visualising and interpreting creative concepts
  - distinguishing subtle differences that affect the matching of elements created in multiple mediums
  - creatively integrating media assets to achieve the required digital visual effects
  - troubleshooting and solving problems as they arise during the process of creating digital visual effects
- self-management, learning and planning skills sufficient to:
  - prioritise work tasks
  - continuously improve skills and knowledge by keeping up to date with industry developments and new software features
  - meet deadlines
  - seek expert assistance as required

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members in the relevant industry sector
  - sound understanding of the relationship between the technical and creative aspects and requirements of productions in which digital visual effects are used
  - issues and challenges that arise in the context of creating digital visual effects sequences

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REQUIRED SKILLS AND KNOWLEDGE
• strong understanding of light, colour, composition and mood • keying process • technical parameters of various platforms and how these impact on the process of creating digital visual effects • OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• creation of a range of digital visual effects sequences that:
	  • meet the requirements of a brief
	  • demonstrate attention to detail and an ability to refine visual effects to achieve the required creative effects
	• collaborative approach to work
	• ability to meet deadlines.

Context of and specific resources for assessment	Assessment must ensure: • access to a selection of industry-current software as listed in the range statement • access to simulated or real production situations that require the creation of digital visual effects sequences • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of digital visual effects sequences created by the candidate to determine ability to create different types of effects • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended,

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EVIDENCE GUIDE	
	for example: • BSBCRT402A Collaborate in a creative process • CUFANM403A Create titles for screen productions.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Production documentation may include:	• animatics • brief • script • shot list • storyboard • technical specifications.
Requirements may include:	• assets for integration • collaboration with other team members • creative expectations • design specifications • output format • technical specifications • timelines.

Digital visual effects may include:	• colour correction
	• compositing:
	  • image layering
	  • motion graphics
	• filters:
	  • warp
	  • glow
	  • blur
	  • fog
	• integrating lighting across different elements
	• keying:
	  • chroma
	  • luma/luminance
	  • difference
	• lighting:
	  • shadow
	  • atmospheric
	  • flares

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RANGE STATEMENT	

	• particle systems:
	  • bubbles
	  • smoke
	  • droplets
	  • weather effects
	  • dust
	  • atmospheric effects
	  • starbursts
	  • fireworks
	• textures, e.g.:
	  • water
	  • cloth
	  • fur
	• tracking:
	  • camera matching
	  • motion tracking.

Relevant personnel may include:	• designer • director • editor • head of department • post-production manager • producer • SFX (special effects) supervisor • storyboard artist • technical director • other technical/specialist personnel.

Software may include:	• 3D, e.g.:
	  • 3D Studio Max
	  • Maya
	  • Soft Image
	• graphics, e.g.:
	  • Photoshop
	  • Illustrator
	• video editing, e.g.:
	  • Adobe Premier
	  • Final Cut Pro
	  • Avid Liquid
	• visual effects/compositing, e.g.:

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RANGE STATEMENT	
	• Combustion • Shake • After Effects • Nuke • Digital Fusion.

Productions may include:	• animated productions
	• commercials
	• digital media products, e.g.:
	  • simulations
	  • games
	  • e-learning resources
	  • virtual worlds/environments
	• documentaries
	• feature films
	• filmed events or performances
	• music video
	• short films
	• television productions.

Delivery platforms may include:	• broadcast television • CD • DVD • film • internet • kiosk • mobile phone • PDA (personal digital assistant) • other digital devices.
Reference material may include:	• books • direct observation of actions • DVDs ('making ofs') • still images • videos.
Assets may include:	• animated sequences • audio tracks • live action film footage • live action video footage • sequences of stills • static background plates • stills.

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RANGE STATEMENT	
Output file format may include:	• AVI • EPS • IFF • JPEG • MPEG • PNG • Quicktime • Targa • TIFF.
Methods and techniques may include:	• 2D graphics and paint • 3D models and animation • compositing.
Compositing techniques may include:	• adding graining • adding motion blur • camera matching • colour matching • combining levels together seamlessly • creating convincing shadows • creating mattes • enhancing the lighting • keying • painting • rotoscoping.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - animation and digital effects

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Co-requisite units

Co-requisite units		

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CUFCAM201A Assist with a basic camera shoot

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to assist with setting up and shooting low-end productions. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	This unit describes the skills and knowledge required of a camera assistant working on low-budget and low-end single-camera video productions. Issues relevant to pre-production and production activities are included. Camera assistants are expected to work under the direction of a qualified camera operator, and may, on occasions, be responsible for operating cameras. Community television is a typical environment where these skills are applied. These skills are applied in the setting up and shooting of a variety of low-end productions, including community television. Skills associated with basic lighting operations are covered in: • CUFLGT101A Apply a general knowledge of lighting to work activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare for camera shoots	1. Organise and prepare ***equipment*** for ***shoots***, taking into account ***location*** requirements 2. Ensure equipment is clean and operational 3. Report equipment faults to ***relevant personnel*** 4. Safely charge batteries according to manufacturer specifications 5. Ensure charged batteries are in sufficient supply to meet the needs of the production schedule 6. Select required ***capture format*** and ensure sufficient supply for the intended ***production***
Assist with camera set-up on location	7. Lift camera and other equipment, using safe lifting and handling techniques 8. Ensure camera and other equipment is safely secured 9. ***Under direction***, assist with positioning the camera to achieve the required shots 10. Safely connect cables and camera to ***power source*** if required 11. Assist with final check of equipment prior to shoot and report faults to relevant personnel 12. Label and load capture media 13. Check camera tilt and pan functions
Set up lighting	14. Mount lighting equipment following safety guidelines 15. Run lighting cables and connect safely to power source ensuring they are located securely 16. Under direction, position lights to achieve required effect 17. Adjust focus and angles of lights as required 18. Install colour frames and gels according to lighting requirements for the particular shoot
Shoot video	19. Adjust and move equipment as required 20. Operate clapperboard if needed 21. Operate camera according to manufacturer guidelines and instructions 22. Shoot and record sequences as directed 23. Time-code recording of takes with descriptions as required
Wrap up shoots	24. Clean and pack equipment using safe lifting techniques 25. Check that all equipment is accounted for and report

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ELEMENT	PERFORMANCE CRITERIA
	faults to relevant personnel 26. Ensure recordings are labelled properly, together with relevant ***documentation*** 27. Leave location in original condition to ensure there is no adverse effect on the site 28. Review and reflect on own performance and note areas for improvement

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and organisational skills sufficient to:
  - interpret production documentation relevant to camera operations
  - work collaboratively with other crew members
  - understand and follow instructions
- technical skills sufficient to:
  - make simple adjustments to, and operate cameras and accessories typically used in low-end productions
  - safely connect cabling and equipment to power sources
- literacy and numeracy skills sufficient to interpret written instructions and to label capture format accurately and in sequence
- self-management skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise
- problem solving skills sufficient to anticipate and deal with minor set-up problems

Required knowledge

- basic technical understanding of camera, lighting and sound equipment used in low-end productions
- full range of functions typically found on cameras used in low-end productions
- basic principles of lighting, e.g. key, fill and back light
- roles and responsibilities of video/television production personnel
- OHS requirements as they relate to working under direction on camera shoots in a range of locations

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • ability to work effectively as a team member and take direction • ability to assist effectively in location set-ups • competent operation of cameras typically used in low-end productions.
Context of and specific resources for assessment	Assessment must ensure: • access to basic camera, lighting and sound equipment • access to a range of varying locations and conditions • access to appropriate learning and assessment support when required • use of culturally appropriate processes, and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • observation of the candidate assisting with a basic camera shoot to determine whether correct procedures are followed and equipment is operated according to instructions • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFLGT101A Apply a general knowledge of lighting to work activities.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment may include:	• cameras, e.g.Â mini DV • filters • lens adaptors • lenses - fixed, zoom, wide-angle • lighting kit • mounts • tripods.
Shoots may include:	• fixed tripod • hand-held • single-camera.
Locations may include:	• day • exterior • in studio • interior • night.
Relevant personnel may include:	• camera and sound operators • director/producer • members of the public • production assistant • reporter or presenter • technical staff.
Capture formats may include:	• CD • DVD • flashcards • P2 solid-state drive • small hard drive • video.
Types of ***production*** may include:	• corporate/training videos • coverage of events • short current affairs stories • short documentaries • short news items.

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RANGE STATEMENT	
Under direction may include direction from:	• camera operator • director/producer • reporter/journalist • sound recordist.
Power sources may include:	• AC • batteries.
Documentation may include:	• fault reports • production schedules • running sheets • scripts • shot lists • sound sheets • stock management and correct labelling.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - Camera/cinematography

Co-requisite units

Co-requisite units		

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CUFCAM301A Shoot material for screen productions

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to shoot screen material using a single-camera unit. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	Camera operators apply the skills and knowledge described in this unit. Their prime responsibility is to capture screen images using a range of video equipment. Operators in this context generally work under direction but perform all camera, sound and lighting functions. Occasionally they will be assisted by a camera assistant or sound recordist. On occasion, they may be required to assist other camera operators with the movement and handling of cameras and cables. Mainstream activities include shooting for news and current affairs, short documentaries, and corporate and training videos. More specialised duties may include the capture of materials for animations and stop-motion animated productions. Typically camera operators are employed by television stations, production houses or corporate video units. In addition, there is a growing body of camera operators who work on a freelance basis. More complex skills associated with shooting television material on location, often as a one-person camera crew, are covered in: • CUFCAM401A Shoot a wide range of television content.

Licensing/Regulatory Information

Not applicable.

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare for shoots	1. Participate in pre-production briefings as required to confirm ***production and post-production requirements*** 2. Arrange ***equipment and accessories*** for ***shoots*** as directed, ensuring that everything is clean and operational 3. Safely charge ***batteries*** according to manufacturer specifications and ensure sufficient supply of charged batteries to meet the needs of production schedules 4. Select required ***capture media*** and ensure sufficient supply for the intended ***production*** 5. Prepare and pack ***lighting*** equipment, including gels and cables as required 6. Undertake minor repairs on faulty equipment or report significant faults to relevant production ***personnel*** 7. Confirm ***location***, shooting schedules and timelines with relevant production personnel 8. Complete appropriate ***documentation*** prior to shoots
Set up on location	9. Determine camera positions to ensure that composition of ***shots*** provides correct visual interpretation of production requirements 10. Liaise and collaborate with crew and talent and contribute ideas to initial concepts 11. Set up equipment and accessories to ensure the safety of personnel on location 12. Consider requirements for repositioning equipment and accessories during shoots taking into account production schedules 13. Ensure cameras and other equipment are safely secured 14. Label and load capture media and check camera functions 15. Position microphones as required and conduct audio check
Set up lighting	16. Assess the quality and quantity of available light and determine the amount of correction required if necessary 17. Mount and position lighting equipment following safety guidelines 18. Run lighting cables and connect safely to ***power sources*** 19. Install colour frames and gels in accordance according to requirements for the specific shoot 20. Select ***lenses*** and ***filters*** appropriate to the prevailing

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ELEMENT	PERFORMANCE CRITERIA
	conditions
Position and operate camera to capture shots	21. Consider camera shots and angles, where feasible, to ensure cuts between shots produce the desired result 22. Take account of editing or other post-production requirements while shooting 23. Ensure camera set-up meets criteria for shoot 24. Check ***camera movements*** to implement planned or rehearsed shots according to direction from relevant production personnel 25. Shoot and record sequences as directed, maintaining focus throughout
Manipulate cables and camera positioning	26. Participate in pre-production meetings and rehearsal, if required, and ensure that final camera and cable movements are understood 27. Communicate with relevant production personnel during shoots and position and move camera cabling according to instructions and cues received 28. React consistently to cues received from relevant production personnel and ensure consistency of timing without undue lapses 29. Move cameras and cabling without impeding the operation of camera operators and work in cooperation with other personnel to achieve the desired camera movements 30. Ensure that camera operators do not collide with other elements 31. Complete cabling handling operations without damage to equipment or injury to personnel
Wrap up the shoot	32. Check and pack equipment and accessories using safe lifting techniques 33. Ensure recorded material is labelled properly, together with relevant documentation 34. Report equipment faults and complete required documentation 35. Leave locations in original condition to ensure no adverse effect on the site 36. Review and reflect on performance and note areas for improvement

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - work collaboratively as a member of a production team
  - understand and carry out instructions and creative directions as required
  - interpret and complete production documentation
- technical skills sufficient to operate a range of professional camera, lighting and audio equipment
- problem solving skills in the context of anticipating and addressing equipment set-up problems
- self-management skills sufficient to:
  - prioritise work tasks
  - meet deadlines
- seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of production and post-production personnel
  - broadcast language and terminology
  - issues and challenges that arise in the context of shooting material for screen productions
- different image capture formats and their uses
- basic framing techniques and methods of composition
- camera-to-subject practice, i.e. lens to eye line, crossing the line, matching shots
- characteristics of commonly used microphones and audio equipment
- the effect of different light sources, diffusion materials, filters and reflectors on the lighting environment, which includes both talent and set
- types of artificial/introduced light sources available to camera operators
- basic principles of lighting, e.g. key, fill and back light
- basic concepts and techniques of cable handling and compatibility with other equipment
- OHS procedures, particularly as they relate to shooting on location

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • ability to work within production deadlines • ability to work effectively as a team member and under direction • ability to provide ideas to assist with capturing the desired style of moving image • ability to operate a range of professional video camera equipment and accessories • ability to set up lighting as directed.
Context of and specific resources for assessment	Assessment must ensure: • access to a functional set of equipment based on items listed in the range statement. Equipment must be sufficient to enable the compilation of a portfolio of screen material shot in different locations, including exterior daytime, interior, night shoots, stormy weather • that the candidate demonstrates competency in shooting material for screen productions within a production environment over a period of time • access to appropriate learning and assessment support when required • use of culturally appropriate processes, and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of screen content shot by the candidate to determine whether production requirements have been met • observation of the candidate setting up and operating

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EVIDENCE GUIDE	
	camera and lighting equipment on location • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFLGT101A Apply a general knowledge of lighting to work activities • CUSSOU201A Assist with sound recordings.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Production and post-production requirements may relate to:	• night shoots • post-production process • props • sets • specialised equipment • venues.

Equipment and accessories may include:	• autocue monitor
	• Betacam SP
	• cables
	• cue card holders
	• digital Betacam
	• digital DVC Pro
	• digital SLR, e.g.:
	  • stop-motion and software
	  • iStop Motion (Mac)
	  • Stop Motion Pro (PC)
	• DV Cam
	• HDDV
	• headphones
	• lighting bulbs
	• lighting kit
	• lights
	• microphones, e.g.:
	  • fixed
	  • pole
	  • lapel
	• mini DV
	• mobile phones
	• motion capture facility for animation
	• mounts
	• recording device (e.g. audiotape recorder)
	• talkback facility

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RANGE STATEMENT	
	• tripod • two-way intercom • video split monitor • video stock.
Shoots may include:	• animations, e.g. stop-motion • combined video and audio function • fixed/supported • hand-held operation • separate video and audio record functions • single-camera.
Batteries may include:	• lead/acid • lithium ION • Ni-Cad.
Capture media may include:	• CD • DVD • flashcards • P2 solid-state drive • small hard drive • videotape.

Production may include:	• animations, e.g.:
	  • modelling
	  • flat plane
	• corporate videos
	• EFP (electronic field production)
	• ENG (electronic news gathering)
	• events or performances
	• news and current affairs
	• short documentaries
	• training videos.

Lighting may include:	• back light • bounced light • effect light, e.g. on backgrounds • fill light • flood light • HMI (hydrargyrum medium arc-length iodide) • interior lights • key light • light meters • luminaires

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RANGE STATEMENT	
	• spot light • tungsten.

Personnel may include:	• animation director
	• camera assistant
	• director/producer
	• floor manager
	• general public
	• safety officer
	• sound recordist
	• supervisor
	• technical staff
	• talent, e.g.:
	  • presenters
	  • actors
	  • reporter/journalist
	• interviewee.

Locations may include:	• day • exterior • interior • night • studio.

Documentation may include:	• animation, e.g.:
	  • scoring sheets
	  • style sheets
	  • character sheets
	  • storyboards
	• computer generated
	• fault reports
	• film and battery labels
	• manually written
	• production schedule
	• running sheets
	• script
	• shot lists
	• stock order forms.

Shots may include:	• close-up • cutaway shot • establishing or master shot • extreme close-up

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RANGE STATEMENT	
	• eye-level shot • hand-held • high-angle • long shot • low-angle • mid shot • pan • point-of-view shot • static • tilt • track • wide shot • zoom in • zoom out.
Power sources may include:	• batteries • generators • mains power.
Lenses may include:	• fixed • lens filters • lens hood • macro • micro • wide-angle • wide-angle adaptor • zoom.
Filters may include:	• chromatic • colour • colour correction • correction filters • enhancers • graduated: hard-edge, soft-edge, attenuated, coloured, neutral density • non-specific colour • polarising • ultraviolet.
Camera movements may include:	• hand-held • pan • tilt • track • zoom in

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RANGE STATEMENT	
	• zoom out.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - Camera/cinematography

Co-requisite units

Co-requisite units		

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CUFDIG201A Maintain interactive content

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to maintain interactive content. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	People responsible for updating the content of websites apply the skills and knowledge described in this unit. Under direction, they upload a range of media assets and change text content, using a content management system that may be a proprietary system designed for a static or dynamic website. Changes to the interface and structure of the site are made by people in more senior positions.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Check website information for relevance and currency	1. Confirm with ***relevant personnel*** frequency of upgrades 2. Obtain revised and additional ***electronic content*** and ensure correct versions 3. Confirm with relevant personnel the age limit of links that should be retained or deleted 4. Confirm with relevant personnel other revisions as required
Check links and navigation	5. Select appropriate ***link-checking software***, run software to test links and check currency of existing links 6. Save report document according to technical and organisational requirements 7. Check broken or failed links to determine site closures or new site addresses
Update information	8. Access ***content management system*** and load appropriate files 9. Delete closed links and re-establish new site links if available 10. Check internal page links and rectify or delete as required 11. Import and/or change content material as required and specify appropriate ***metadata*** if required 12. Make heading, typographical and image revisions applying appropriate style sheets and alt tags if required 13. Insert additional pages or screens as required, applying appropriate templates or themes 14. Upload edited files to server using file transfer protocols (FTP). 15. Advise relevant personnel if new buttons, interface or navigation design are required to incorporate additional materials
Test and confirm changes	16. Check all links are valid 17. Confirm with relevant personnel that all changes have been made

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - interpret and apply information in user manuals for software applications
- ability to work as a member of a production team - both independently on assignment and under direction
- technical skills sufficient to:
  - proficiently use a content management system
  - use link-checking software
  - manage files using standard naming conventions
  - apply appropriate metadata to describe documents
  - apply style sheets, templates and themes
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- W3C Accessibility standards relevant to text and images
- internet protocols and data types
- OHS standards as they relate to working on computers for periods of time

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • accurate creation of interactive media information and links • proficient use of content management systems • attention to detail.
Context of and specific resources for assessment	Assessment must ensure: • access to industry-standard authoring software, the internet and an FTP client for uploading content • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of websites where content has been updated by the candidate on a regular basis • written or oral questioning to test knowledge of internet protocols, data types and W3C Accessibility standards relevant to text and images.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFIND201A Develop and apply creative arts industry knowledge • CUFRES201A Collect and organise content for broadcast or publication.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• client • programmer and technical support people • supervisor • web manager • other specialist creative and administrative staff as appropriate.
Electronic content may include:	• audio • HTML • images (photographs and illustrations) • PDF documents • text • video • Word documents.
Link-checking software may include:	• Xenu • Linkbot • software internal to content management systems.

Content management systems may include:	• authoring tools, such as:
	  • Dreamweaver
	  • Contribute
	• learning management systems, such as:
	  • WebCT
	  • Blackboard
	  • Janeson
	  • Moodle
	  • Sharepoint
	• open source database systems
	• other proprietary database systems.

Metadata may include:	• author • copyright • date • description

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RANGE STATEMENT	
	• subject • title • other metadata based on Dublin Core or other standards.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFDIG301A Prepare video assets

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare video assets for inclusion in interactive media. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	The size of an organisation or project determines who undertakes the role described in this unit. In a large-scale environment, the person responsible for this task would typically be supervised by a video editor and an interactive media author. In a television production environment, the prime focus of the task involves converting television programs into podcast material or in a form appropriate to streaming or downloading, and this may be a dedicated role under the supervision of a producer. In a smaller organisation or project, a video editor or interactive author or programmer would absorb this task into their own role. In all cases, they are collaborating closely with other team members. Skills associated with other aspects of video production at this level are covered in: • CUFCAM201A Assist with a basic camera shoot • CUFPOS201A Perform basic vision and sound editing.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify video assets	1. Obtain digital sources of video 2. Identify ***file format of source video*** 3. Identify output ***purpose***, ***destination*** and ***platform*** 4. Discuss with ***relevant personnel*** required ***output file format*** and ***codecs*** for specified bandwidths 5. Discuss with relevant personnel appropriate ***video encoding software***
Prepare video assets	6. Open appropriate video encoding software and load video file 7. Ensure duration of video sequences meets that required by the specification, and clip if necessary 8. Determine and apply appropriate video and audio codecs 9. Batch and optimise video files where possible 10. Save files in appropriate output file format using standard naming conventions
Package video assets	11. Assign ***metadata tags*** if required 12. Group files logically in folder system using standard naming conventions 13. Store in share drive or asset repository for production team access

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to interpret and clarify written or verbal instructions
- ability to work as a member of a production team - both independently on assignment and under direction
- technical skills sufficient to:
  - proficiently use video software to prepare video sequences for inclusion in an interactive media product
  - manage files using standard naming conventions
  - apply appropriate metadata tags to describe files
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- techniques for saving and preparing digital video output to optimise file size
- OHS standards as they relate to working for periods of time on computers
- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - basic understanding of the relationship between technical and creative aspects and requirements of interactive media projects
  - basic knowledge of the features of a range of delivery platforms
  - basic understanding of what happens when video files are compressed for inclusion in interactive media products
  - appropriate codecs for various platforms and destinations
  - digital video source and output formats

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • preparation of a range of video sequences to be included in interactive media products that meet appropriate technical specifications • proficient use of video encoding software.
Context of and specific resources for assessment	Assessment must ensure: • access to industry-standard video encoding software • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of video assets prepared by the candidate on a number of occasions • written or oral questioning to test knowledge of codecs for various platforms and understanding of file compression.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFSOU301A Prepare audio assets.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
File format of source video includes:	• Betacam, including SP and digital • DVC • DVD • miniDV • SVHS • Umatic • VHS.
Purpose may include:	• animation • e-learning resource • game • interactive application • website.

Destination may include:	• computer-based playback software, such as iTunes
	• downloading server
	• internet video players, such as:
	  • QuickTime
	  • Windows Media Player
	  • RealPlayer
	• progressive downloading (buffering) server
	• streaming server.

Platform may include:	• CD • DVD • games console • internet • kiosk • mobile phone • other video playback devices • personal digital assistant (PDA) • video player (iPods).
Relevant personnel may include:	• client • producer

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RANGE STATEMENT	
	• programmer and technical support people • supervisor • video editor • other specialist creative and administrative staff.
Output file formats include:	• FLV • lossless and lossy • M4V • MOV • MPEG-2 • MPEG-4 • RealMedia • WAV • WMV.

Codecs may include:	• audio codecs, including:
	  • mono and stereo
	  • bit sampling rates and bit depth
	  • standardised and pre-set codecs
	• video codecs, including:
	  • screen size
	  • frame rate
	  • bit rate (constant and variable)
	  • one pass and double pass
	  • standardised and pre-set codecs, such as:
	  • H.261, H.263 and H.264
	  • MPEG
	  • Sorenson, Cinepak, RealVideo
	  • MMV.

Video encoding software may include:	• specialised video compression tools, such as DivX and Squeeze
	• video editing tools, such as:
	  • Adobe Premier
	  • Final Cut Pro
	  • Final Cut Express
	  • QuickTime Pro
	  • Media 100
	  • iMovie
	  • Movie Maker
	  • WaveLab.

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RANGE STATEMENT	
Metadata tags may include:	• author • copyright • description • other as specified • resolution • version.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFDIG302A Author interactive sequences

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to use an authoring tool to produce discrete interactive sequences. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	People responsible for developing small components to be integrated into a larger project apply the skills and knowledge described in this unit. They could be working under the direction of an interactive author or programmer to produce several web pages, or a sequence of screens for other forms of delivery. They need to draw on technical assistance from a programmer or other technical support personnel to produce sequences for server side technologies. In all cases, they are collaborating with other members of a team and need a sound understanding of the project on which they are working. More complex skills associated with authoring are covered in: • CUFDIG401A Author interactive media • CUFDIG404A Apply scripting language in authoring.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Plan use of authoring tool	1. Identify a range of appropriate ***authoring software*** 2. Discuss with ***relevant personnel*** the range of authoring software and their application to various ***delivery platforms*** 3. Discuss with relevant personnel ***design specifications*** of the ***project*** 4. Discuss with relevant personnel technical requirements of the project in order to select authoring software
Prepare to use authoring tool	5. Load selected authoring software 6. Create a new file for the specified task and name file using standard naming conventions 7. Display and use tools and features of authoring software relevant to the authoring process
Produce interactive sequences	8. Produce screens and layout according to design specifications applying basic ***visual design principles*** 9. Create ***interactive media components*** as required 10. Source text content and apply style sheets to format text 11. Source relevant ***media assets***, optimise if required and integrate using appropriate ***file formats*** 12. Produce and link all components according to storyboard and apply templates or themes 13. Manipulate markup code where errors are occurring or to finetune functionality 14. Save in appropriate file format to directory
Check functionality of interactive sequence	15. Check that interactive elements function with minimal error on a variety of systems 16. Present sequence to relevant personnel 17. Incorporate changes as required

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions and design specifications
  - interpret and apply information in user manuals for software applications
- ability to work as a member of a production team - both independently on assignment and under direction
- technical skills sufficient to:
  - use appropriate authoring software to proficiently author the sequences applying style sheets, templates or themes
  - integrate media assets for specific bandwidths
  - manage files and create appropriate directories
  - efficiently use a computer, including keyboard shortcuts
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - basic understanding of the relationship between technical and creative aspects and requirements of interactive media projects
  - basic knowledge of the features of a range of delivery platforms
  - file formats of digital media assets and basic optimisation techniques
  - HTML
  - W3C Accessibility standards relevant to text and images
- basic visual design principles as listed in the range statement
- OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • development of several discrete interactive media sequences that function as planned and demonstrate an understanding of basic visual design principles • accuracy and attention to detail in the process of developing interactive media sequences.
Context of and specific resources for assessment	Assessment must ensure: • access toa range of resources, equipment and current industry-standard software, as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of interactive sequences authored by the candidate • written or oral questioning to test knowledge of file formats and delivery platforms.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG304A Create visual design components.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Authoring software may include:	• Director • Dreamweaver • Flash • FrontPage • PageMill.
Relevant personnel may include:	• designer • graphic designer • information architect • interaction designer • programmer • supervisor • trainer • user interface designer • other specialist staff.
Delivery platforms may include:	• CD • DVD • internet • kiosk • mobile phone • personal digital assistant (PDA) • other wireless/mobile devices.

Design specifications may include:	• content inventory
	• interactive script
	• personas
	• storyboard
	• target audience
	• technical requirements, such as:
	  • delivery platform
	  • screen resolution and size
	  • templates, style sheets and themes
	  • bandwidth information
	• user interface design.

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RANGE STATEMENT	

Projects may include:	• production of interactive sequences to be incorporated in a:
	  • game
	  • educational product
	  • promotional product
	  • information product
	  • training product
	  • e-commerce.

Visual design principles may include:	• balance • emphasis • focal point • movement • perspective • proportion • scale • unity.
Interactive media components may include:	• backgrounds • banners • icons • interactive buttons • interactive controls • logos • text • titles • user interfaces.
Media assets may include:	• animation • audio • documents, such as PDF, Word, PowerPoint and Excel • graphics • photo images • text • video.
File formats may include:	• DIR/DCR • FLA/SWF • GIF • HTML • JPEG • MOV

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RANGE STATEMENT	
	• MPEG • PDF • PICT • RTF • TIFF • WMV.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFDIG303A Produce and prepare photo images

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare photo images for integration into an interactive media sequence or product. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	This role may be assigned to a graphic artist or, in a larger project, to a photographer who works closely with a programmer or interactive media author to publish required images. The photography ranges from digital still composition to panoramas for the production of virtual worlds. Photo images can include landscapes, objects and portraits. Specialist skills associated with photography are covered in: • CUVPHI06A Plan and carry out image capture in response to a brief.

Licensing/Regulatory Information

Not applicable.

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Use scanner to capture photo images	1. Source and select appropriate photographic images according to requirements of photographic ***project*** brief 2. Discuss selection of images with ***relevant personnel*** 3. Assess ***scanner features*** to ensure that outcomes will meet the requirements of brief 4. Operate scanner according to manufacturer specifications 5. Select ***scanner settings*** to ensure image capture meets production requirements 6. Transfer and store photographic image files to a computer using standard naming conventions
Use digital camera to create photo images	7. Discuss photographic project brief with relevant personnel 8. Assess ***digital camera features*** to ensure that outcomes will meet the requirements of brief 9. Plan camera shots taking into account lighting, framing, composition and other ***photographic techniques*** 10. Load and operate digital camera according to manufacturer specifications 11. Consider digital camera focus, exposure and shutter speed to ensure image capture meets production requirements 12. Check photographic images for fitness of purpose to comply with brief 13. Transfer and store photographic image files to a computer using standard naming conventions
Edit photo images	14. Load ***digital imaging software*** and import photo image source files 15. ***Manipulate*** and save digital images using designated digital imaging software 16. Create photo images that incorporate ***visual design*** and ***communication principles*** using designated digital imaging software 17. Evaluate the outcome for visual impact, effectiveness and fitness for purpose 18. Confirm outcome with relevant personnel
Prepare photo image assets	19. Save files in appropriate ***output format*** to meet ***platform*** requirements 20. Assign ***metadata tags*** if required

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ELEMENT	PERFORMANCE CRITERIA
	21. Group files logically in a folder system using standard naming conventions 22. Store files in share drive or repository for production team access

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills sufficient to:
  - interpret and clarify written or verbal instructions
  - consult equipment operation manuals
- ability to work as a member of a production team - both independently on assignment and under direction
- technical skills sufficient to:
  - proficiently use a scanner to reproduce photo images to specification
  - proficiently use a digital camera to create well-composed photo images
  - proficiently use digital imaging software to manipulate and prepare photo images
  - manage files using standard naming conventions
- self-management skills sufficient to:
  - work under pressure
  - meet deadlines
  - seek expert assistance when problems arise
- problem-solving skills sufficient to anticipate and resolve minor equipment set-up problems

Required knowledge

- basic photographic techniques
- basic principles of visual design and communication
- appropriate file formats for various platforms
- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - basic understanding of the relationship between technical and creative aspects and requirements of interactive media projects
  - basic knowledge of the features of a range of delivery platforms
- OHS regarding the use of scanners, cameras and computers, and handling and disposing of lithium batteries

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • ability to use digital imaging software to prepare high quality photo images that satisfy the requirements of a range of briefs • efficient operation of a scanner and digital camera to capture images.

Context of and specific resources for assessment	Assessment must ensure:
	• access to a range of resources and equipment currently used by industry, including:
	  • flatbed scanner
	  • digital camera
	  • industry-standard graphics software
	• access to appropriate learning and assessment support when required
	• use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of photo images prepared by the candidate on a number of occasions • practical demonstration by the candidate of scanner and digital camera operation • written or oral questioning to test knowledge of file formats and OHS issues.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG304A Create visual design components.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Projects may include:	• e-commerce • educational product • game • information product • promotional product • training product • website.
Relevant personnel may include:	• client • designer • graphic artist • interactive media author • programmer, coder and technical support people • supervisor • web manager • other specialist creative and administrative staff.
Scanner features may include:	• bit depth • dynamic range • optical resolution • output format (e.g. RGB, greyscale or CMYK) • platen size • reflective or transmissive (film) • range of film holders.
Scanner settings may include:	• bit depth • colour or greyscale • colour/target/working space • crop • destination • dust and scratch handling (e.g. ICE, FARE) • grain management (e.g. GEM) • multi-sampling

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RANGE STATEMENT	
	• orientation • output dimension and resolution or file size • preferences/options • restoration of colour (e.g. ROC) • scaling • sharpening • source image type • tones, contrast, colour cast, saturation.
Digital camera features may include:	• aperture • automatic, program or manual settings • batteries • colour, target, working space • compatibility with hardware and digital imaging software • exposure compensation • file format • flash, fill flash • lens focal lengths, such as wide angle, close-up and telephoto • menu functions • resolution - megapixels • shutter speed • size and type of memory card(s) • subject modes • white balance.
Photographic techniques may include:	• composition • depth of field • dynamic range • field of view • framing • lighting.

Digital imaging software may include:	• a wide range of programs, e.g.:
	  • Adobe Photoshop
	  • Adobe Photoshop Elements
	  • Adobe Photoshop Lightroom
	  • Apple Aperture
	  • Corel Paint Shop Pro
	  • Corel PhotoPaint
	  • GNU Image Manipulation Program (GIMP and GIMPshop).

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RANGE STATEMENT	
Manipulating digital images may include:	• appending text/type for files and captions • brushing • creating artistic effects • cropping • editing • eliminating red eye • emulating photographic effects • image enhancement including tones, contrast, colour cast/tint, saturation • masking layers • retouching (i.e. cloning, rubber stamping, healing, patching) • sharpening • stitching (panoramic scenes) • using layers for composites • using pre-sets.
Visual design principles may include:	• balance • emphasis • movement • perspective • proportion • scale • unity.
Communication principles may include:	• communicates message • conveys meaning • meets audience requirements • uses functional components.
Output formats may include:	• GIF • JPEG • PDF • PICT • PNG • PSD • TIFF.
Platforms may include:	• CD • DVD • games console • internet • kiosk • mobile phone

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RANGE STATEMENT	
	• other video playback devices • personal digital assistant (PDA) • video player (iPods).
Metadata tags may include:	• author • copyright notice • date of capture/date created • description • EXIF and IPTC standards • file size • format • headline/caption • keywords/subject • location/GPS coordinates • resolution • rights usage terms • roll/identifier # • subject • time • title • version.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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Co-requisite units		

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CUFDIG304A Create visual design components

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to create visual designs for a range of interactive media components. People in this role work closely with other members of a production team. They create visual design components in response to specifications and under the supervision of a graphic designer or producer. They contribute creative ideas to the overall concept that needs to take account of technical considerations, such as the final delivery platform. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	This unit requires the application of the key principles and practice of graphic design in the context of creating visual design components that could be integrated into a range of media products, including print media. A graphic artist usually undertakes this role and is expected to be competent in a range of design techniques, including freehand drawing. The visual design output will nevertheless be in a digital format for inclusion in a final media product. More complex skills associated with visual design aspects of a whole interactive media product are covered in: • CUFDIG402A Design user interfaces • CUFDIG403A Create user interfaces.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Clarify work requirements	1. Clarify type of visual design ***components*** required, in consultation with ***relevant personnel*** 2. In discussion with relevant personnel, identify factors that may determine or affect visual design concepts, including ***design techniques*** 3. Clarify in discussion with relevant personnel the target user and audience, and determine ***format*** and ***delivery platform***
Generate and assess ideas	4. Review media products, designs, images, artwork and other creative sources that may inspire visual design ideas 5. Obtain other ***relevant information*** that may influence design ideas 6. Generate a range of visual design ideas that are technically feasible, respond to specifications and provide creative solutions to all design issues 7. Present visual design ideas to relevant personnel using design techniques
Plan approach	8. Experiment with traditional and digital imaging techniques to create required visual design components 9. Explore range of ***typographical*** and ***visual design elements*** to create the components 10. Evaluate initial design ideas and specifications against findings and discuss with relevant personnel to select final design concept 11. Select design technique and discuss with relevant personnel to ensure appropriate output format meets delivery platform requirements
Produce visual design components	12. Develop structure for components based on the final design concept using selected design techniques 13. Apply ***visual design principles*** and ***communication principles*** to produce components 14. Save visual design in an appropriate format that satisfies the technical parameters determined in consultation with relevant personnel
Finalise visual design components	15. Review visual design components to assess whether creative solutions meet design and technical specifications 16. Discuss and confirm with relevant personnel additional requirements or modifications and undertake any

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ELEMENT	PERFORMANCE CRITERIA
	necessary amendments

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written and verbal instructions
  - work as a member of a production team - both independently on assignment and under direction
  - respond constructively to feedback received from other team members
- initiative and enterprise in the context of generating a range of feasible ideas for visual designs
- technical skills sufficient to:
  - use a range of design techniques for creating visual designs, including industry-standard graphics software
  - apply visual design and communication principles to produce visual designs
  - create visual design components in appropriate formats for a range of delivery platforms
  - manage files and directories using standard naming conventions
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members
  - basic understanding of the relationship between technical and creative aspects and requirements of media projects
- basic design principles of layout and composition
- characteristics of digital and traditional imaging
- visual design and communication principles
- typography
- copyright clearance procedures
- OHS standards as they apply to the use of computer and keyboard for periods of time

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • creation of visual design components that respond effectively to specifications and demonstrate the application of visual design and communication principles • ability to apply a selection of the design techniques listed in the range statement • ability to work collaboratively in a team environment.
Context of and specific resources for assessment	Assessment must ensure: • access toa range of resources, equipment and current industry-standard software as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of visual design components created by the candidate • written or oral questioning to test knowledge of visual design principles, communication principles and responsibilities of different members of a project team.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG303A Produce and prepare photo images

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EVIDENCE GUIDE	
	• CUFANM301A Create 2D digital animations.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Components may include:	• 2D animation objects • backgrounds • banners • basic user interfaces • colours • flow charts • icons • illustrations • interactive buttons • interactive controls • logos • simple 2D animation characters • text • titles • other components required by the project.
Relevant personnel may include:	• art director • asset creator • client • editor • producer • programmer • supervisor • technical director • technical staff • other specialist creative and administrative staff.
Design techniques may include:	• drawing freehand • drawing on a tablet • flow charts • scanning drawings and photographs • storyboards • thumbnail sketches

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RANGE STATEMENT	

	• using graphics software, such as:
	  • Corel Draw
	  • Corel Paint Shop Pro
	  • Photoshop
	  • Photoshop Elements
	  • Illustrator
	  • Paint.net
	  • Fireworks.

Format may include:	• bitmap image
	• digital formats, such as:
	  • GIF
	  • JPEG
	  • PDF
	  • TIFF
	  • PICT
	  • PNG
	  • PSD
	  • HTML
	• hard copy
	• vector image.

Delivery platform may include:	• CD • DVD • film • games console • internet • kiosk • mobile phone • other wireless/mobile devices • personal digital assistant (PDA) • print media • television.
Relevant information may include:	• brands • logos • previous versions of components • printed materials • promotion materials • style guides • trademarks.

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RANGE STATEMENT	
Typographical design elements may include:	• alignment • fonts and typefaces • kerning • leading • point and size • serif or sans serif • tracking.
Visual design elements may include:	• colour • form • line • shape • texture • tone.
Visual design principles may include:	• balance • emphasis • focal point • movement • perspective • proportion • scale • unity.
Communication principles may include:	• communicates message • conveys meaning • meets audience requirements • uses functional components.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

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Co-requisite units

Co-requisite units		

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CUFDIG401A Author interactive media

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to author a complete interactive media product, for example, a whole website. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	People in this role need a sound understanding of mark-up languages (HTML and XML). In addition, they need to be familiar enough with scripting languages to use script libraries in authoring software to provide interactive features. Authors work primarily on client-side technologies. In the construction of dynamic websites, for example, they develop the templates, themes and style sheets for the programmers and technical support team to integrate into the database and install on a web server. Authors also develop forms and form objects, but the scripting for form processing is provided by programmers. Authors may also use a variety of authoring software to produce complex interactions such as digital simulations, games and puzzles. In interactive media development, authors are working with a team, including user interface designers, interactive designers, asset creators and server-side programmers. Skills associated with scripting are covered in: • CUFDIG404A Apply scripting language in authoring.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify multimedia elements	1. Obtain ***design specifications*** 2. Locate content required for ***productions*** 3. Discuss issues of integration and formats of ***media assets*** with ***relevant personnel*** 4. Determine with relevant personnel an interactive sequence to become the prototype
Identify scope of authoring software	5. Identify range of industry-standard ***authoring software*** 6. Assess the authoring software in relation to specified ***delivery platform*** 7. Discuss selection of authoring software with relevant personnel to ensure selection will meet specified outcomes 8. Select authoring software best suited to job requirements
Use authoring software	9. Load authoring software 10. Create a new file for the specified task and name using standard naming conventions 11. Display and use tools and features of authoring software relevant to the authoring process
Create interactive sequence	12. Slice and reassemble the user interface appropriate to the authoring software 13. Import and assemble components in appropriate sequence according to creative requirements 14. Create interactive features according to creative and technical requirements, sourcing and writing appropriate ***markup and scripting languages*** as required 15. Check that interactive sequence conforms to navigation design 16. Integrate media assets to ensure highest levels of technical performance 17. Check that interactive sequence conforms to loading specifications 18. Test for interoperability, eliminate all bugs and validate scripting 19. Present interactive sequence as a prototype ensuring that sequence meets creative, production and technical requirements 20. Save ***output file formats*** and identify for specified purpose
Evaluate interactive	21. Present prototype to relevant personnel

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ELEMENT	PERFORMANCE CRITERIA
prototype	22. Evaluate prototype against design specifications, including achievement of a creative and user-centred product 23. Discuss and agree on required changes 24. Assist in user trials as required 25. Evaluate feedback from user trials 26. Seek confirmation from relevant personnel to transform prototype into final product
Seek confirmation from relevant personnel to transform prototype into final product	27. Make necessary changes as indicated by user trials 28. Replicate prototype functionality to complete the interactive product 29. Make final checks to ensure sequences conform to design specifications 30. Test for interoperability, eliminate bugs and validate scripting 31. Save to specified storage system accessible to production team 32. Assist in loading product to specified platform as required

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to interpret and clarify written or verbal instructions
- ability to work as a member of a production team - both independently on assignment and under direction
- technical skills sufficient to:
  - correctly interpret design briefs, and design and technical specifications
  - proficiently use appropriate authoring and graphics software
  - seamlessly integrate and optimise a range of media assets to highest levels of technical performance
  - create and apply style sheets, templates or themes to conform with W3CAccessibility standards as they apply to client-side technology
  - manage files and directories using standard naming conventions and version control protocols
- initiative and flexibility in the context of troubleshooting and solving problems as they arise during the authoring process
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance as required

Required knowledge

- scope and applicability of industry-standard authoring software
- technical requirements for integrating digital content for use on a range of delivery platforms, including:
  - animation
  - graphics
  - text
  - video
  - audio
- user-centred design principles
- design principles of layout and composition
- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - sound understanding of the relationship between technical and creative aspects and requirements of interactive media projects

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REQUIRED SKILLS AND KNOWLEDGE
• sound knowledge of the features of a range of delivery platforms • markup and scripting languages as they apply to relevant authoring software • W3C Accessibility standards • purpose and process of validation and the role of interoperability standards • issues and challenges that arise in developing interactive media products • OHS standards as they relate to working on computers for periods of time

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• development of an integrated and fully functional interactive media product that:
	  • conforms to design specifications
	  • meets W3C Accessibility standards
	  • demonstrates creativity in design solutions
	• collaborative approach to work.

Context of and specific resources for assessment	Assessment must ensure: • access toa range of resources, equipment and current industry-standard software as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of at least two interactive products authored by the candidate • written or oral questioning to test knowledge of the processes followed to develop an interactive product and the respective roles and responsibilities of team members.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG404A Apply scripting language in authoring • ICAU4207B Apply web authoring tool to convert

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EVIDENCE GUIDE	
	client data for websites.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Design specifications may include:	• creative requirements
	• navigation design
	• priority levels of W3C Accessibility standards
	• storyboards
	• technical specifications, including:
	  • disk space
	  • delivery platform
	  • file format for final product
	• time
	• user interface design.

Productions may include:	• e-commerce • educational product • game • information product • interactive application • promotional product • training product • website.
Media assets may include:	• animation • audio • graphics • images • text • video.
Relevant personnel may include:	• animator • artist • asset creator • graphic designer • graphic interface designer • instructional designer • navigation designer • programmer

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RANGE STATEMENT	
	• project manager • sound engineer • video producer • other specialist staff.

Industry-standard ***authoring software*** may include:	• Authorware
	• Breeze
	• Captivate
	• Contribute
	• Director
	• Dreamweaver
	• Flash
	• GoLive
	• PageMill
	• RoboDemo
	• graphics software, including:
	  • Photoshop
	  • Fireworks
	  • Illustrator
	• simulation software, such as LabView.

Delivery platform may include:	• CD • DVD • internet • kiosk • mobile phone • personal digital assistant (PDA) • other wireless/mobile devices.
Markup and scripting languages may include:	• ActionScript • HTML • JavaScript • Lingo • XML • other proprietary scripting languages.
Output file formats may include:	• DIR/DCR • FLA/SWF • HTML • PDB • PDF • PRC • TXT

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RANGE STATEMENT	
	• WAP • XML • other proprietary formats.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFDIG502A Design web environments

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design web environments. A web environment may consist of one or many web applications and technologies integrated in various combinations. The design is focused on how these applications and technologies are combined and used, and the way in which interactive content is accessed by users. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	A person in this role works with clients to develop design specifications for web environments. Other specialised designers, graphic artists and programmers working as a team undertake the development of design specifications. Higher order skills associated with developing and documenting concepts that could be used as the basis for design specifications are covered in: • BSBCRT501A Originate and develop concepts.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Determine project requirements	1. Analyse project brief to identify ***purpose*** of, and target audience for, web environments 2. Consult with clients to clarify ***project requirements*** 3. Identify target ***audience characteristics*** and determine how these influence all aspects of design 4. Identify content to be incorporated and generated and how this content is to be accessed, searched or delivered
Research and select web environments	5. Research ***web environments*** and analyse their potential 6. Analyse how these web environments meet audience and content requirements 7. Identify issues relating to ***delivery platform*** and ***standards***, and determine how these may affect web environment options 8. Consult ***relevant personnel*** to ensure that all possible web environment options are considered 9. Select web environments that will meet creative, production and technical requirements
Draft design specifications	10. Design the architecture of web environments to show interrelationship between environment components 11. Identify each web environment and specify its individual interactive features, functionality and navigation and its relationship to design as a whole 12. Identify content components and specify how these will be logically structured and integrated into and/or generated by web environments 13. Specify levels of access permissions to web environments as required 14. Specify ***media assets*** as required 15. Specify user interfaces of web environments 16. Specify ***production requirements***, including appropriate ***testing strategies*** 17. Write draft ***design specifications*** to include all relevant advice to design and development teams 18. Discuss draft design specifications with client to ensure designs are consistent with project briefs
Review and confirm design specifications	19. Review designs against required project outcomes, as well as client and audience needs 20. Review designs to ensure they meet creative and technical requirements

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ELEMENT	PERFORMANCE CRITERIA
	21. Adjust designs as necessary after discussions with relevant personnel 22. Clarify ***legislative or ownership issues*** to comply with production and organisational requirements 23. Confirm with client acceptance of design specifications, including deliverables, milestones and timelines

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written proposals and creative briefs
  - work collaboratively in a team environment
  - present ideas for the design of web environments for discussion and feedback from team members
  - clearly and concisely document specifications for the design of web environments
- initiative, enterprise and creativity in the context of:
  - generating ideas for the design of web environments
  - thinking laterally when developing concepts
  - undertaking background research into web environments
  - maintaining design integrity
  - finding solutions to problems encountered when designing web environments
  - finding ways to minimise the effect of technical constraints
  - ensuring there is an intuitive and logical flow to the navigation of web environments
- technical skills sufficient to create storyboards, maps and other diagrams to specify the architecture and navigation of web environments
- self-management skills sufficient to:
  - meet deadlines
  - provide appropriate and timely documentation

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - sequence and interrelationship of stages in the process of developing web environments
  - broad range of web applications and technologies
  - web design and its relationship to web optimisation strategies
  - web standards, including SCORM, usability, W3C Accessibility and interoperability
  - issues and challenges that arise in designing and developing web environments
- typical formats and techniques for documenting the design of web environments
- OHS standards as they relate to working for periods of time on computers

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REQUIRED SKILLS AND KNOWLEDGE
• intellectual property rights and copyright clearance procedures

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• design specifications for web environments that:
	  • are well documented and clearly presented
	  • meet client and audience requirements
	  • are technically feasible
	• ability to work effectively as a member of a production team.

Context of and specific resources for assessment	Assessment must ensure: • practical demonstration of skills through the design of web environments for at least two projects • access to project briefs on which designs can be based • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of designs for web environments documented by the candidate and of their effectiveness in terms of meeting project requirements • observation of a candidate presenting his/her design for web environments to team members and explaining how it meets requirements • written or oral questioning to test knowledge as listed in the required skills and knowledge section of this unit.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG505A Design information architecture • CUFPPM404A Create storyboards.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Purpose may include:	• business and corporate • community • education • entertainment • government • information and news • knowledge management • personal • promotion • training.

Project requirements may include:	• access to facilities and resources
	• budget
	• deliverables
	• milestones
	• personnel, including:
	  • number
	  • availability
	  • expertise prototyping
	• technical issues, including:
	  • delivery platform
	  • disk space
	  • bandwidth
	  • testing plan
	• timelines.

Audience characteristics may include:	• computer literacy
	• demographics, such as:
	  • age
	  • gender
	  • education
	  • occupation
	  • location

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RANGE STATEMENT	
	• cultural background • hobbies • interests • internet literacy • language, literacy and numeracy • personas • specific needs - physical or psychological.
Web environments may include one or combinations of:	• audio streaming • blog • chat • conferencing tool • content learning management system (CLMS) • content management system (CMS) • database repository • discussion forum • dynamic website • electronic newsletter • interactive calendar • interactive form • learning management system (LMS) • podcast • RSS feed • static website • TiVo • video streaming • other online collaboration and social network tools.
Delivery platform may include:	• digital television set • internet • mobile phone • other wireless/mobile devices • personal digital assistant (PDA).
Standards may include:	• interoperability • SCORM • usability • W3C Accessibility.
Relevant personnel may include:	• art director • client • educator • graphic designer

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RANGE STATEMENT	
	• head of department • information architect • instructional designer • programmer • technical director • technical staff • other specialist creative and administrative staff.
Media assets may include:	• animation • audio • audio/visual files, such as PowerPoint • graphics • images • text • text documents, such as PDF and Word • video.
Production requirements may include:	• levels of expertise • production deadlines • production schedules • production team • production values • testing strategies.
Testing strategies may include:	• alpha • beta • completion • continuous • milestone • prototype • staged.
Design specifications may include:	• content inventory • diagrams • flow charts • maps • navigation charts • plans • storyboards • technical specifications • user interface mock-ups • wire frames.

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RANGE STATEMENT	
Legislative or ownership issues may be:	• access and equity • clearances • confidentiality • copyright • intellectual property rights • non-disclosure agreements • open source licensing • ownership of assets • product licensing.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFDIG503A Design e-learning resources

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design an e-learning resource. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	The skills and knowledge outlined in this unit are applied by people working in education or training organisations, or in media production companies that specialise in the development of e-learning resources. The focus of this unit is different to that of the two units in the Training and Assessment Training Package that deal with e-learning resources. Namely: • TAADES503B Research and design e-learning resources • TAADES504B Develop and evaluate e-learning resources. These two units are written from the perspective of people in training organisations who are responsible for developing and delivering learning materials to be included in e-learning resources. CUFDIG503A is written from the perspective of a department or company responsible for developing the design of broad ranging e-learning resources in consultation with clients. However, there are synergies between the units and it may be appropriate to combine them in learning programs.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify project requirements	1. With reference to project briefs, identify ***target learner characteristics*** and their impact on the way resources are designed 2. Identify ***content*** to be incorporated or generated and how this content is to be accessed or delivered 3. Identify ***delivery platforms*** and implications that these will have on selection of ***media assets*** 4. Consult with clients to clarify ***project requirements***
Research and select instructional design model	5. Analyse content to clearly establish learning outcomes and assessment strategies 6. Research a range of ***instructional design models***, considering their characteristics, differences and ability to meet briefs 7. Identify ***standards*** that may apply for a range of delivery platforms 8. Identify ***learning styles*** of target learners and consider how these may impact on the design 9. Consider a range of ***learning activities*** that best meet learning objectives and needs of target learners 10. Consult with ***relevant personnel*** to ensure that a full range of instructional design models has been identified and sourced 11. Select the instructional design model that best meets learning needs and project requirements
Draft design specifications	12. Use selected instructional design model to design the overall architecture of an e-learning resource 13. Design sequences and interactivity based on content and project requirements 14. Develop content templates for content experts if required 15. Specify media assets as required 16. Specify ***communication and collaborative tools*** as required 17. Specify user interface of the e-learning resource 18. Specify ***production requirements***, including appropriate ***testing strategies*** 19. Write draft ***design specifications*** to include relevant advice to design and development teams 20. Discuss draft design specifications with clients to ensure

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ELEMENT	PERFORMANCE CRITERIA
	designs are consistent with project briefs
Finalise design specifications	21. Review designs against required project outcomes and target learner needs 22. Review designs to ensure they meet creative and technical requirements 23. Adjust designs as necessary after discussions with relevant personnel 24. Clarify ***legislative or ownership issues*** to comply with production and organisational requirements 25. Confirm with clients acceptance of design specifications, including deliverables, milestones and timelines

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify project briefs
  - establish rapport with clients
  - work collaboratively in a team environment to find the best design solutions
  - clearly and concisely document specifications for the design of e-learning resources
- initiative and enterprise in the context of:
  - generating ideas for the design of e-learning resources that meet the needs of target learners
  - thinking laterally when developing ideas
  - selecting the most appropriate instructional design model
  - maintaining design integrity
- technical skills sufficient to:
  - create storyboards, maps and other diagrams to specify the architecture and navigation of e-learning resources
  - construct material in a logical order, one sequence flowing on from another
  - develop techniques for holding learner's attention
- self-management skills sufficient to:
  - meet deadlines
  - provide appropriate and timely documentation

Required knowledge

- typical formats and techniques for documenting the design of e-learning resources
- OHS standards as they relate to working for periods of time on computers
- range of learning models
- way in which various learning styles impact on learning models
- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - sequence and interrelationship of stages in the process of developing e-learning resources
  - web standards, including usability, W3C Accessibility and interoperability
  - web applications and technologies that are relevant to e-learning
  - issues and challenges that arise in designing and developing e-learning resources

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REQUIRED SKILLS AND KNOWLEDGE
• intellectual property rights and copyright clearance procedures

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• design specifications for e-learning resources that:
	  • are well documented and clearly presented
	  • meet learner requirements
	  • are technically feasible
	• ability to work effectively as a member of a production team.

Context of and specific resources for assessment	Assessment must ensure: • practical demonstration of skills through the design of at least two e-learning resources for delivery on different platforms • access to project briefs on which designs can be based • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of designs for e-learning resources documented by the candidate and of their effectiveness in terms of meeting project requirements • role-play involving a candidate presenting his/her design for an e-learning resource to a client and explaining how it meets requirements • written or oral questioning to test knowledge as listed in the required skills and knowledge section of this unit.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFPPM404A Create storyboards.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Target learner characteristics may include:	• computer literacy
	• demographics, such as:
	  • age
	  • gender
	  • education
	  • occupation
	  • location
	  • cultural background
	• hobbies
	• interests
	• internet literacy
	• language, literacy and numeracy levels
	• learning environment, such as:
	  • workplace
	  • classroom
	  • home
	  • community
	  • mobile
	• personas
	• preferred learning styles
	• skills level
	• specific needs - physical or psychological.

Content may include:	• audio/visual materials
	• curriculum documents, such as:
	  • Training Packages and their units of competency
	  • modules
	• guides
	• manuals
	• PowerPoint presentations
	• pre-existing learning materials
	• printed materials

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RANGE STATEMENT	
	• reference texts • training handouts.

Delivery platform may include:	• CD/DVD
	• digital television set
	• internet, including:
	  • websites
	  • blogs
	  • wikis
	  • database repositories
	  • learning management systems, such as:
	  • Blackboard
	  • WebCT
	  • Janeson
	  • Moodle
	  • virtual classrooms
	  • conferencing
	  • discussion forums
	  • flash-based
	  • chat
	  • podcasting
	  • video streaming
	  • audio streaming
	  • other online collaboration tools
	• mobile phone
	• personal digital assistant (PDA)
	• other wireless/mobile devices.

Media assets may include:	• animations • audio • audio/visual files, such as PowerPoint • graphics • images • text documents, such as PDF and Word • video.
Project requirements may include:	• access to facilities and resources • assessment strategies • budget • deliverables • learner characteristics • milestones

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RANGE STATEMENT	

	• personnel, including:
	  • number
	  • availability
	  • expertise
	• prototyping
	• technical issues, including:
	  • delivery platform
	  • disk space
	  • bandwidth
	  • testing plan
	• timelines.

Instructional design models include:	• exploration • game • instructional • lock step • mentoring • problem-solving • puzzle • simulation • story-telling.
Standards may include:	• AQTF • interoperability • SCORM • usability • W3C Accessibility.
Learning styles may include:	• activist • learning preferences, including auditory, visual or sensory • pragmatist • reflective • theorist
Learning activities may include:	• blogs • case studies • checklists • discussions and debates • games • interviews • media presentations • problems

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RANGE STATEMENT	
	• projects • quizzes • research reports • role-plays • simulations • tasks • work-based practical activities.
Relevant personnel may include:	• art director • client • content expert • educator • graphic designer • head of department • information architect • language, literacy and numeracy specialist • programmer • reference group member • technical director • technical staff • other specialist creative and administrative staff.
Communication and collaborative tools may include:	• blogs • chat • discussion forums • messaging • TiVo • wikis • other social software tools.
Production requirements may include:	• levels of expertise • production deadlines • production schedules • production team • testing strategies.
Testing strategies may include:	• alpha • beta • completion • continuous • milestone • prototype • staged.

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RANGE STATEMENT	
Design specifications may include:	• content inventory • diagrams • flow charts • maps • navigation charts • plans • storyboards • technical specifications • user interface mock-ups • wire frames
Legislative or ownership issues may be:	• access and equity • clearances • confidentiality • copyright • intellectual property rights • non-disclosure agreements • open source licensing • ownership of assets • product licensing.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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Co-requisite units		

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CUSSOU502A Produce sound recordings

Modification History

Release	Comments
Release 2	Created to fix formatting errors only. Released with CUS09 Music Training Package version 1.2

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce a musical recording.

Application of the Unit

Music producers and sound engineers apply the skills and knowledge described in this unit. They are responsible for working collaboratively and creatively with artists and performers to produce musical recordings which can be distributed through record companies and in a range of media, such as television, film, video and the internet.

Even though their particular focus is on performers and their skills to produce a creative work, they are responsible also for the quality and balance of the final recording. In addition, they need a range of musical, technical, personal, business and management skills.

Skills associated with managing the process of sound recordings are covered in:

- CUSSOU602A Manage production of sound recordings.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable

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Employability Skills Information

Not applicable

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm concept for recording project	1.1 Apply knowledge of commercial music trends, market niches, new musical styles and artists to develop the musical vision and concept for a ***recording project*** 1.2 Establish and discuss ***production requirements*** with ***relevant personnel*** 1.3 Apply musicianship knowledge and awareness of sound design possibilities to develop the underlying artistic style and creative concept for the recording 1.4 Discuss and confirm vision for sound concepts with relevant personnel to achieve consensus on artistic values and agreed project outcomes 1.5 Address ***copyright requirements*** to ensure that the recording process and product comply with legislation
2. Confirm recording project arrangements	2.1 Confirm repertoire, artists, project vision and operational details in consultation with relevant personnel 2.2 In collaboration with artists, ensure that adequate time and facilities are provided to achieve the agreed performance standard within time and budget constraints 2.3 Plan and agree on communication processes and time schedules with artists and technical production personnel 2.4 Ensure that time schedules are drawn up and distributed to each artist for all proposed rehearsal and recording sessions 2.5 Liaise with technical staff regarding appropriate ***recording sites***
3. Manage recording sessions	3.1 Confirm that sessions are scheduled to allow adequate rehearsal and sound testing prior to main recording sessions 3.2 Ensure recording site, ***sound equipment*** and recording ***formats*** are appropriate for the ***media*** and project requirements 3.3 Communicate criticism of performers' work in a balanced, constructive and supportive manner that includes positive and achievable options for meeting desired artistic goals 3.4 Ensure that individual perspectives are considered and conflicting requirements are recognised and constructively negotiated 3.5 Continuously monitor all aspects of the recording and

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ELEMENT	PERFORMANCE CRITERIA
	ensure that any necessary adjustments are made in line with creative and technical requirements 3.6 Collaborate with relevant personnel to ensure that sound balances are artistically appropriate
4. Evaluate the recording process and product	4.1 Discuss and obtain agreement on ***evaluation techniques*** for evaluating the recording process and completed product 4.2 Seek and obtain feedback from relevant personnel to assess the recording process and product 4.3 Evaluate own role in the production of recordings and note areas for improvement 4.4 Use evaluation results to improve future practice

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication and teamwork skills sufficient to:
  - interpret and clarify written proposals and creative briefs
  - understand artists' requirements
  - work effectively with artists and sound engineers
  - work constructively with group dynamics
  - identify and deal effectively with conflict
  - direct and monitor the work of others
- listening skills sufficient to:
  - use aural imagination to develop coherent and innovative artistic sound outcomes within the scope of planned artistic and commercial objectives
  - discriminate and enhance texture and tone colour in line with objectives
  - understand appropriate intonation, dynamics, phrasing, rhythm and expression to produce the required sound
  - listen critically to the creative and technical work of others
  - listen critically to and adjust performance of others to achieve the required sound
  - continuously evaluate and adjust the production of musical work
- planning and organisational skills sufficient to:
  - clarify roles
  - work within budgets and timeframes
  - plan recording projects
  - use time-management strategies to set priorities
  - develop systems for required documentation
- initiative, enterprise and creative skills sufficient to:
  - demonstrate artistic leadership
  - use innovative approaches to recording to enhance the interpretation and performance of music or to create new possibilities through artistic and technical effects
  - interpret music appropriately to ensure a sympathetic and appropriate approach to sound production
- technical skills sufficient to apply knowledge of acoustics:
  - in sound production to recording projects
  - to instruments/voices in placements and settings for sound balance in recording

Required knowledge

- well-developed understanding of psychoacoustic principles, including:

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  - spatial hearing
  - direct sound
  - early sound
  - reverberant sound
  - studio and control room design
  - ergonomics
- industry knowledge, including:
  - varied characteristics of sound in a range of recording and performance environments
  - musical repertoire, styles, forms, systems, practices and customs
  - appropriate styles of musical interpretation and sound production
  - relevant musical terminology
  - features and characteristics of a range of instruments
  - performance customs of music genres relevant to selected area of music recording
  - copyright law and permissions
  - issues and challenges that arise in the context of producing musical recordings
- sound understanding of recording techniques, such as:
  - microphone and instrument/voice placement
  - application of effects
  - mixing sound sources
- issues and challenges that typically arise in the context of producing sound recordings
- OHS principles of safe listening, including safeguards against hearing loss

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Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• produce at least two sound recordings that demonstrate:
	  • well-developed critical-listening and aural-discrimination skills
	  • a creative and appropriate musical concept that demonstrates knowledge of musicianship, repertoire, recording techniques and an awareness of sound design possibilities
	• work creatively, collaboratively and constructively with performers to produce a sound recording.

Context of and specific resources for assessment	Assessment must ensure:
	• access to:
	  • relevant instruments and equipment
	  • scores, charts or other written music resources
	  • participants, such as performers and technical crew
	  • appropriate recording facilities with adequate space and acoustic qualities
	• use of culturally appropriate processes, and techniques appropriate to the language and literacy capacity of learners and the work being performed.

Method of assessment	The following assessment methods are appropriate for this unit: • observation of a recording session where the candidate is the producer • written or oral questioning to test knowledge as listed in the required knowledge section of this unit • authenticated musical recordings where the candidate was the producer • authenticated samples of project plans prepared by the candidate • case studies and scenarios as a basis for discussion about issues and challenges that arise in the context of producing musical recordings.

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Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • BSBPMG510A Manage projects • CUFCMP501A Manage and exploit copyright arrangements • CUSSOU504A Create a final sound balance • CUSSOU603AManage production of sound recordings.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Recording projects may be for:	• solo artists • solo artists with backing • groups/ensembles • vocal • vocal and instrumental • instrumental, acoustic and/or electronic.
Production requirements may include:	• technical • creative • artistic • attributions • audience • budget • confidentiality • content • contractual arrangements • copyright • deadlines • direct quotes • duration • intellectual property • interviews • location • purpose • schedule • style.
Relevant personnel may include:	• clients • artists, musicians and performers • directors • producers • post-production personnel • program managers • sound designers and editors • video and sound recorders • audio personnel:

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	• sound engineers • sound technicians • sound editors • sound designers • sound effects personnel • recordists • re-recording mixers • broadcasters • broadcast engineers.
Copyright requirements may include:	• provisions of current Copyright Act • copyright permission procedures • attribution • moral rights and performer's rights • negotiating with copyright organisations, such as: • owners of copyright: publishers, composers, etc. • Australasian Performing Rights Association (APRA) • Phonographic Performance Company of Australia Limited (PPCA) • Australasian Mechanical Copyright Owners Society (AMCOS) • Copyright Agency Limited (CAL) • archives.
Recording site may include:	• dubbing theatre • on location, including interior and exterior • outside broadcast • post-production studio • recording studio • sound stage.
Sound equipment and accessories may include:	• amplifiers • analogue to digital converters • cables • compact disc (CD) and digital versatile disc (DVD) players and burners • computer technology and associated software • recording devices: • hard disk recorder, e.g. digital audio workstation (DAW) • digital audiotape recorder, e.g. S-DAT and

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	R-DAT • digital videotape recorder (DVTR) • mini disc recorder (MD) • modular digital multi-track recorder (MDM) • digital audio players, such as: • iPod • MP3 • headphones • microphones and accessories • mixing consoles and desks • monitors and speakers • signal processors and plug-ins.
Formats may include:	• quarter inch audiotape • WAV • AIFF • Apple Lossless • WMA • MP3 • Vorbis • ATRAC • AAC.
Media may include:	• radio • video • CD • DVD • computer hard drive • internet • mobile device • film.
Evaluation techniques may include:	• interviews • surveys • questionnaires • focus groups • demographic data • feedback • reviews • evaluation may include: • clients • record companies • stakeholders

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	• audience • project personnel • specialists.

Unit Sector(s)

Media and entertainment production - audio/sound

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CUSSOU403A Perform advanced sound editing

Modification History

Release	Comments
Release 2	Created to fix formatting errors only. Released with CUS09 Music Training Package version 1.2

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to perform advanced sound editing. This involves assessing the quality of original recorded sound against production requirements, determining the scope of the sound-editing project, preparing source materials for sound editing, editing sound in line with production requirements, and applying sound effects to enhance the final product.

Application of the Unit

This unit applies to sound editors who edit music and sound effects for film, television, interactive media and music productions as well as to technicians who work in film and sound archives.
This work is undertaken with minimal supervision and guidance. Sound editors at this level could also be responsible for supervising others.
This units builds on the skills covered in the imported unit:

- CUFSOU204A Perform basic sound editing.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable

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Employability Skills Information

Not applicable

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for sound editing	1.1 Participate in pre-production meetings with ***relevant personnel*** to discuss ***production requirements and procedures*** 1.2 Check that necessary copyright releases have been organised 1.3 Consider the impact of different ***release sound formats*** when planning editing work 1.4 Check sound ***equipment*** to ensure it is operational and appropriate for the task 1.5 Prepare a team work plan as required and brief relevant personnel accordingly 1.6 Obtain original ***sound sources*** and assess their quality against production requirements 1.7 Check any ***documentation*** in the receipt and preparation of original recordings and copies for ***productions*** 1.8 Advise where sound sources do not meet quality and production requirements and propose options to resolve issues as required 1.9 Anticipate problems that may arise during the editing process and plan accordingly
2. Edit complex sound sequences	2.1 Check the ***format*** of all sound sources, ensuring it is compatible with editing software, equipment and ***media*** output 2.2 Critically listen to sound sources to determine the extent and range of required edits 2.3 ***Manipulate editing software*** and equipment to produce required outcomes and to resolve identified problems 2.4 Work sensitively and constructively with relevant personnel to achieve best production outcomes
3. Create overall sound context	3.1 Determine the ***purpose*** for which sound is being used in productions 3.2 Identify, select and/or ***produce*** appropriate sound effects or elements 3.3 Apply knowledge and understanding of ***sonic lexicon*** to enhance final creative outcomes 3.4 Note sound effects and elements on spotting sheets 3.5 Incorporate sound effects and elements to meet creative requirements
4. Finalise editing	4.1 Participate in spotting sessions with relevant personnel

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ELEMENT	PERFORMANCE CRITERIA
operations	and make adjustments to mix as required 4.2 Ensure that final files are in the correct format 4.3 Manage the quality check of the final sound mix in line with enterprise procedures and production requirements 4.4 Archive edited audio files and complete associated documentation according to enterprise procedures 4.5 Ensure that ***work environment*** is left clean and ready for the next user 4.6 In collaboration with support personnel, organise and maintain sound effects libraries for future productions 4.7 Provide feedback to other team members as required 4.8 Evaluate own performance against technical and creative criteria and note areas for improvement

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication and teamwork skills sufficient to:
  - work collaboratively with project team personnel and sound-production personnel
  - provide feedback to project personnel on appropriate editing techniques
  - provide critical feedback on problems with technical quality of masters and condition of equipment
- literacy skills sufficient to:
  - log and label recorded material
  - accurately note sound effects on spotting sheets
  - read and interpret an edit decision list (EDL)
- numeracy skills sufficient to calculate duration and capacity of media at various speed/sample rates
- initiative and enterprise skills in the context of:
  - finding creative solutions to sound-editing challenges
  - applying critical-listening skills to analyse sound recordings and finding solutions to creative and/or technical problems
- learning skills sufficient to maintain currency of knowledgeof editing software and equipment upgrades
- planning and organisational skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - locate sound effects
- problem-solving skills sufficient to promptly and effectively rectify sound defects, system failures and mechanical breakdowns
- technology skills sufficient to:
  - use a variety of sound-editing equipment and software on both PC and MAC operating systems
  - manage file systems
  - make regular backups

Required knowledge

- principles of sonic storytelling, e.g. using sound (or silence) to:
  - focus attention
  - intensify action
  - set pace
  - set mood
  - evoke feelings

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- well-developed understanding of psychoacoustic principles, including:
  - spatial hearing
  - direct sound
  - early sound
  - reverberant sound
  - studio and control room design
  - ergonomics
- well-developed understanding of audio principles, including:
  - frequency
  - pitch
  - amplitude
  - loudness
  - velocity
  - wavelength
  - acoustical phase
  - timbre
  - sound envelope
- intellectual property implications in relation to sound design
- picture and sound synchronisation, including:
  - time codes
  - frame rates
  - sample rates
  - clock leader 2 pips
- principles and techniques of sound editing, including:
  - manipulating sound to achieve technical and creative outcomes
  - using effects to achieve a range of functional sound requirements
  - eliminating audible defects
  - compatibility of different digital standards
  - identification/logging requirements
  - file formats, technical standards and compression
- issues and challenges that typically arise in the context of performing complex sound edits
- OHS principles of:
  - safe listening, including safeguards against hearing loss
  - using a computer and keyboard for periods of time

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Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • use all features of a range of current industry sound-editing software and equipment • make critical editing decisions that enhance the quality and impact of the final sound • incorporate a range of sound effects into the final mix • work cooperatively in a team environment • meet deadlines.
Context of and specific resources for assessment	Assessment must ensure: • access to current industry-standard equipment as listed in the range statement • use of culturally appropriate processes, and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	The following assessment methods are appropriate for this unit: • observation of candidate undertaking complex sound edits, including the incorporation of sound effects • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by candidate • authenticated recordings of material edited by the candidate • case studies and scenarios as a basis for discussing issues and challenges that arise in the context of complex sound editing.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUSSOU404A Edit dialogues.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• performer • composer • sound supervisor • supervising sound editor • preservation supervisor • archivist • effects editor • effects mixer • sound mixer • recordist • re-recording mixer • audio assistant • audio and sound engineer • director • producer • post-production picture editor • post-production manager • program manager • sound designer.
Production requirements and procedures may include:	• creative • technical • file formats • agreement on file naming structures • work flow after capture • prerelease screenings to check quality of sound mix • technical checks • spotting sessions • attributions • audience • budget • confidentiality • content • contractual arrangements

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	• copyright • deadlines • direct quotes • duration • intellectual property • interviews • location • purpose • schedule • style.

Release sound formats may include:	• IMAX multichannel system
	• 5.1 surround sound:
	  • cinema
	  • television
	• 4-track Dolby stereo
	• 2-track stereo
	• internet
	• games
	• radio.

Equipment may include:	• digital audio workstation (DAW) with software, such as:
	  • Pro Tools
	  • Nuendo
	  • Pyramix
	  • Fairlight
	  • Sound Forge
	  • Adobe Audition
	  • Final Cut Pro
	  • Avid
	  • EDL software
	• mixing consoles
	• outboard gear, such as:
	  • re-verb unit
	  • sub-base harmoniser
	  • de-esser
	  • compressor.

Sound sources may include:	• dialogues and voice-overs • special effects • music • walla

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	• ambient sound • atmospheric sound • foley.
Documentation may include:	• pre-mix scripts • mixing sheets • track sheets • de-noising documents • cue sheets • dubbing sheets • queries • notes • manuals.
Production may include:	• commercial • print advertisement • corporate video • feature film and/or video • filmed event and/or performance • interactive media product • internet production • electronic game production • music recording and/or video • promotional trailer • radio broadcast • short film and/or video • television program • training film and/or video • oral histories • voice-over.

Format may include:	• audio/sound, such as:
	  • DAT
	  • AIF (AIFF)
	  • WAV
	  • broadcast WAV format (BWF)
	  • WMA
	  • MIDI
	  • OGG
	  • advanced audio coding (AAC)
	  • Apple Lossless
	  • magnetic tape
	  • Real Audio
	  • QuickTime

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	• MP3 • computerised data.
Media may include:	• radio • video • CD • DVD • DAT • computer hard drive • internet • mobile device • film.

Manipulating editing software may include:	• adjusting and normalising audio levels
	• inserting:
	  • transitions
	  • sound effects
	  • music
	  • voice-overs
	  • overlays
	• manipulating audio clips, such as:
	  • cutting
	  • pasting
	  • copying
	  • moving
	  • splitting.

Purpose may include:	• breakingÂ theÂ screenÂ plane • definingÂ space • focusingÂ attention • establishingÂ locale • creatingÂ environment • emphasisingÂ action • intensifyingÂ action • depictingÂ identity • settingÂ pace • providingÂ counterpoint • creatingÂ humour • symbolisingÂ meaning • creatingÂ metaphor • unifyingÂ transition • creating silence.
Producing sound effects may	• creating and synchronising effects in a post-production studio

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involve:	• recording during shooting • collecting in the field • generating effects electronically.
Sonic lexicon may refer to genres, such as:	• silent film • natural history • drama productions • animation • comedy • horror.
Work environment may include:	• dubbing theatre • on location, including interior and exterior • outside broadcast • post-production studio • recording studio • sound stage • cultural institution • archive.

Unit Sector(s)

Media and entertainment production - audio/sound

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CUSSOU302A Record and mix a basic music demo

Modification History

Release	Comments
Release 2	Created to fix formatting errors only. Released with CUS09 Music Training Package version 1.2

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to undertake the technical side of making a basic music demo. There are two stages to the process - making a multi-track recording of the music performance and then mixing the recording down to a stereo format. An ability to work collaboratively with musicians is essential, together with an ability to troubleshoot equipment problems.

Application of the Unit

The skills and knowledge described in this unit would typically be applied in a home-based studio equipped with a digital audio workstation (DAW). The unit complements CUSMPF304A Make a music demo, which covers the process of making a demo from the perspective of performers.
More complex skills associated with mixing music are covered in:

- CUSSOU405A Mix recorded music

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable

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Employability Skills Information

Not applicable

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Clarify music demo requirements	1.1 In consultation with ***relevant personnel*** confirm the ***purpose*** of the demo 1.2 Contribute to the development of a recording plan that takes into account a range of ***factors*** as required 1.3 Agree on ***method*** and ***format*** for final recording
2. Record performers	2.1 Position performers, musical instruments and equipment for optimum sound quality 2.2 Check that ***equipment*** is installed and aligned correctly 2.3 Ensure that microphones are operational at all times 2.4 Route test signals to the correct signal path and check that level of test signal is correct 2.5 Create a headphone mix for musicians 2.6 Capture sound sources according to the agreed method
3. Mix sound sources	3.1 Use appropriate panel controls to mix and balance sound sources to achieve required artistic effects 3.2 Produce transitions between sounds that are technically accurate and produce the required effect 3.3 Apply ***sonic effects*** and ***signal processing*** as required 3.4 Ensure that monitoring levels meet current safety standards 3.5 Ensure that the level of the composite signal is within technical limits and desired dynamic range
4. Finalise music demo	4.1 Assess the mix on speakers appropriate to the particular end use 4.2 Assess each track for correctness and quality and evaluate the mix in terms of meeting demo requirements 4.3 Listen to final mix with relevant personnel and agree on changes required to improve the quality of the mix 4.4 Incorporate final adjustments to the sound mix as required 4.5 Produce a master in the agreed format and make a backup 4.6 Keep ***documentation*** as required 4.7 Clean ***work environment*** after use and restore to pre-use condition

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- critical-listening and aural-discrimination skills
- literacy skills sufficient to:
  - log and label tracks
  - note and report faults and problems
  - read and understand mixing documentation
- numeracy skills sufficient to calculate duration of tracks
- communication and teamwork skills sufficient to:
  - liaise with sound-production personnel and performers
  - understand and follow instructions
- planning and organisational skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise
- problem-solving skills sufficient to identify faults that may occur in audio-production environments and refer problems to relevant personnel
- learning skills in the context of acting on constructive feedback about own work performance
- technology skills sufficient to operate:
  - a variety of mixing consoles
  - signal-processing and effects devices

Required knowledge

- basicaudio principles and practice, including:
  - range of microphones and contexts in which they are used
  - microphone characteristics, e.g. frequency response, sensitivity and polar patterns
  - effect of microphone placement on quality of sound
  - characteristics of sound in a range of environments
  - signal-to-noise ratio, signal phase and audio level/headroom control
  - audible defects in analogue and digital technologies
  - features of mixers, amplifiers, speakers and effects racks
  - signal distortion
- basic principles of acoustics, including:
  - frequency
  - pitch
  - amplitude

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  - loudness
  - velocity
  - wavelength
  - acoustical phase
  - timbre
  - sound envelope
- basic understanding of psychoacoustic principles, including:
  - spatial hearing
  - direct sound
  - early sound
  - reverberant sound
  - room design
- characteristics of musical instruments in the context of recording and mixing
- techniques for manipulating input signals and gaining structure through use of:
  - equalisers
  - filters
  - compressors/expanders
  - faders and auxiliaries
  - effects devices
- issues and challenges that typically arise in the context of recording and mixing a basic music demo
- OHS requirements, including:
  - safe manual-handling techniques
  - working safely with electricity and hazardous substances
  - principles of safe listening, such as safeguards against hearing loss

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Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • record and mix at least two basic music demos • work cooperatively with performers to achieve the required effect.
Context of and specific resources for assessment	Assessment must ensure: • access to performers requiring a basic music demo • access to industry-current sound mixing equipment • use of culturally appropriate processes, and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	The following assessment methods are appropriate for this unit: • observation or video recording of the candidate during recording and mixing sessions • evaluation of authenticated audio recordings where the candidate was responsible for recording and mixing music • written or oral questioning to test industry knowledge as listed in the required knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFSOU204A Perform basic sound editing • CUSSOU201A Assist with sound recordings • CUSSOU303A Set up and disassemble audio equipment.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• artists, musicians and performers • audio and sound engineers • broadcasters • producers • post-production personnel • program managers • camera operators.
Purpose may include:	• pitching a product at record labels • pursuing work at live music venues • getting work via live music or advertising agencies • getting air play on media outlets • accompanying a funding application • uploading onto music and/or social networking websites • developing media for band or solo artist websites • supporting applications for study and/or remote auditions • expanding a music portfolio • documenting a music project or other creative body of work.

Factors may include:	• musical style
	• contractual arrangements
	• copyright
	• budget
	• timelines
	• availability of personnel, including:
	  • musicians
	  • sound recordists
	  • sound mixers
	  • post-production personnel
	• promotional materials
	• distribution strategies

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	• recording location, including:
	  • live music venue
	  • recording studio
	  • private residence
	• rehearsal requirements
	• number of recording sessions required
	• equipment requirements
	• hire of equipment or venue
	• instruments
	• props
	• costumes
	• make-up.

Method may include:	• live to two-track stereo • live multi-tracking • multi-tracking with click • combination live recording and prerecorded samples • recording to analogue tape • recording to hard disk or digital tape • remixing existing music • video • using music production software for mixing and mastering.

Format may include:	• compact disc (CD)
	• audio file formats for upload and distribution within virtual environments and/or onto relevant media players, such as:
	  • MP3
	  • WAV
	  • AIFF
	• audiotape
	• video:
	  • digital (high resolution)
	  • digital (compressed for online environment)
	  • analogue.

Equipment may include:	• digital audio workstation (DAW) with software, such as:
	  • Pro Tools
	  • Logic
	  • Cubase

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	• Ableton Live • Reason • Nuendo • Garage Band • Digital Performer • Soundscape • Sonic Studio • hard disk recorders • multi-track recorder • stereo recorders • microphones, such as: • dynamic • condenser • lavalier • shotgun • directional • radio • microphone stands • microphone accessories • microphone windscreens • headphones • amplifiers • speakers • mixing console/desk, including: • analogue • digital • digitally controlled analogue (hybrid) • effects rack • sequence sampler • cables and connectors.
Sonic effects may include:	• change in pitch • change in speed • echo • pan • fade in and fade out • filter • invert • normalise • repeat • reverb • modulation

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	• wahwah.
Signal processing may include:	• amplification • compression • noise processing • spectrum signal processing • equalisation • time signal processing.
Documentation may include:	• pre-mix scripts • mixing sheets • track sheets • cue sheets • dubbing sheets • queries • notes • manuals.
Work environment may include:	• dubbing theatre • outside broadcast • post-production studio • recording studio • sound stage • home studio.

Unit Sector(s)

Media and entertainment production - audio/sound

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CUVDRA201A Develop drawing skills

Modification History

Version	Comments
CUVDRA201A	This version first released with *CUV11 Visual Arts, Craft and Design Training Package version 1.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to use basic drawing techniques to produce creative work. This unit relates to drawing as an art form and therefore differs from units that focus on drawing as a visual representation tool.

Application of the Unit

People with little or no drawing experience apply the skills and knowledge outlined in this unit. Typically they are embarking on a career in visual arts or a related area of creative practice and may have acquired general design or drawing skills either at school or through self-directed learning and experimentation.
At this level, they are applying basic techniques to produce drawings from simple ideas. Supervision and guidance would usually be provided.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Prepare drawing resources	1.1 Identify and obtain drawing ***tools, equipment*** and ***materials*** 1.2 Prepare tools, equipment and materials according to ***workplace procedures*** and safety requirements 1.3 Set up a safe work space with guidance from ***key people***
2. Use and test drawing techniques	2.1 View a range of drawings in different styles and discuss with others how effects are achieved 2.2 Match potential techniques to the ***ideas*** for the work with the assistance of key people 2.3 ***Test*** nominated ***techniques*** to determine the effects they achieve 2.4 Safely use selected techniques to produce drawings 2.5 Calculate correct quantities of materials required and minimise waste where possible 2.6 Clean and store tools, equipment and materials according to safety requirements and specific needs of different items
3. Make plans to develop skills	3.1 Seek feedback on drawing work from key people 3.2 Respond positively to feedback and identify key areas for improvement 3.3 Review different opportunities to build own skills and select suitable options

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
  - discuss the process for producing drawings with others
  - understand and follow instructions
- learning skills to:
  - improve techniques for producing drawings through practice
  - respond appropriately to feedback
- literacy skills to read product and equipment safety labels
- numeracy skills to calculate quantities of materials
- planning and organising skills to prepare and set up resources and work space.

Required knowledge

- materials, tools and equipment commonly used for drawing
- major styles of drawing and the work of key practitioners relevant to individual area of interest
- typical work space and equipment requirements for the production of different types of drawings
- cleaning and maintenance techniques for tools and equipment used in drawing
- elements and principles of design – what they are and what they mean
- intellectual property considerations for any person making creative work
- ways of minimising waste in the use of drawing tools, equipment and materials
- OHS procedures that apply to drawing work.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • produce drawings where the techniques and materials support the ideas for the work • apply knowledge of drawing tools, equipment and materials.
Context of and specific resources for assessment	Assessment must ensure access to: • equipment and materials used to produce drawings.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of drawings in progress • questioning and discussion of the candidate's intentions and work outcome • review of portfolios of evidence • review of third-party reports from experienced practitioners. Assessment methods should closely reflect workplace demands (e.g. literacy) and the needs of particular groups (e.g. people with disabilities, and people who may have literacy or numeracy difficulties, such as speakers of languages other than English, remote communities and those with interrupted schooling).
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUVPRP201A Make simple creative work.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Tools and equipment may include:	• brushes • crayons • electronic equipment and accessories • pencils • pens • rags • scrapers • spatulas • sponges • sticks.
Materials may include:	• chalks • charcoal • crayons • ink and wash • papers • pastels • watercolour.
Workplace procedures may relate to such things as:	• cost control • process-specific procedures • recycling • reporting • safety • use of materials.
Key people may include:	• arts practitioners • mentors • supervisors • teachers.

Ideas may be influenced by:	• elements and principles of design
	• subject matter or theme for the work, such as:
	  • built environment
	  • identity
	  • land and place
	  • natural world

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	• political, cultural and social issues • the body • spiritual concerns.
Process used to ***test*** techniques may include:	• experimenting directly with work in progress • exploring techniques by making practice pieces • making samples using nominated techniques.

Techniques would generally be quite limited in nature and may include:	• digital drawing techniques
	• basic use of:
	  • linear marks of differing intensity and character
	  • linear marks to produce illusion of three-dimensional (3-D) form
	  • simple linear perspective through the use of a vanishing point
	  • tonal range to produce illusion of a 3-D form.

Unit Sector(s)

Visual communication – drawing

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CUVPHI519A Investigate and exploit innovative imaging options

Modification History

Version	Comments
CUVPHI519A	This version first released with *CUV11 Visual Arts, Craft and Design Training Package version 1.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to investigate and exploit creative and innovative options in the production of photo images using a variety of imaging technologies and processes.

Application of the Unit

The photo imaging practitioner is required to resolve complex visual communications problems and create innovative images. In creating these images, the practitioner must interact with a range of imaging technologies (analog, digital, hybrid, traditional and emerging). These are part of the production workflow where images are captured, enhanced and output. The selection, application and adaptation of imaging technologies allow the practitioner to acquire unique and innovative images.
This work is usually undertaken independently, with guidance where required.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Research a range of imaging technologies	1.1 Critique and review ***historical, contemporary and emerging imaging technologies*** with ***appropriate people*** 1.2 Examine and clarify ***discipline, subject matter and themes*** of photography/photo imaging and their related imaging technologies 1.3 Identify and review the connection between imaging technology and the ***visual representation, attributes and opportunities*** of an image's subject matter 1.4 Evaluate ***specialised imaging technologies*** and their corresponding imaging workflow 1.5 Evaluate currency and credibility of information gathered and ensure research scope is sufficiently broad
2. Create test images and evaluate attributes of imaging technologies	2.1 Acquire or gain access to specialised imaging technologies in cooperation with imaging specialists and suppliers 2.2 Identify and apply appropriate OHS processes and standards in use of specialised imaging technologies 2.3 Apply specialised imaging technologies and imaging workflow to create test images 2.4 Review personal performance in creation of test images
3. Create body of work using imaging technologies	3.1 Select appropriate imaging technology to create a ***body of work*** with specific subject matter or theme 3.2 Consider requirements of creative vision/product and adopt imaging workflow to create images 3.3 Review and adapt imaging workflow to ensure consistency of creative vision and product 3.4 Plan, prepare and organise body of work for presentation using appropriate technology and context 3.5 Review personal performance in creation of body of work and identify concepts for future research 3.6 Store and maintain reference journal of specialised imaging technologies 3.7 Document imaging workflow, reinstate equipment and archive imaging products appropriately

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- photo imaging skills to:
  - archive, maintain and manage analog and digital assets
  - competently operate imaging technologies along with design and allied technologies used within the imaging environment
  - create and optimise files and film to photo imaging industry standards
  - implement OHS and quality control procedures as they apply to all aspects of the imaging process
- research skills to access and compare contemporary styles and conceptual and aesthetic approaches to photo imaging
- critical thinking skills to:
  - reflect on and analyse own performance
  - recognise innovative imaging opportunities from research and testing processes
- literacy skills to:
  - interpret technical information relating to the imaging environment
  - obtain necessary permits and licences to operate equipment and work in special locations
- numeracy skills to determine mathematical problems arising from technical imaging processes
- communication skills to:
  - engage with subjects and professionals in a meaningful and respectful way
  - explain and describe work practices and methods
  - negotiate with models, creative teams and project stakeholders
- learning skills to:
  - learn the operation of equipment
  - review personal performance within project context
  - upgrade knowledge required to work in varied locations
- planning and organising skills to:
  - coordinate activities of models and assistants
  - organise shoots on location or in studio and prepare shoot management timelines
- technology skills to check and reinstate equipment, studio and props.

Required knowledge

- OHS procedures and standards associated with imaging technology
- imaging technology to determine suitability for innovative and creative production purposes
- traditions and contemporary issues that inform imaging technology.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • research, identify, test and apply innovative imaging concepts and technology • implement OHS and quality control procedures when applying imaging concepts and technology • review personal performance when applying imaging concepts and technology.

Context of and specific resources for assessment	Assessment must ensure:
	• access to:
	  • a range of technology and media used in the broad imaging environment
	  • sources of information on the historical and contemporary imaging environment
	  • appropriate learning and assessment support when required
	• opportunity for collaboration with or in allied industries
	• the use of culturally appropriate processes, and techniques appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence • review of third-party reports from experienced practitioners • direct observation of candidate applying imaging technology, implementing OHS and quality control processes and meeting deadlines • case studies to assess candidate's ability to evaluate imaging technology and its suitability for historical and contemporary contexts and themes • problem-solving activities to assess candidate's critical thinking skills.

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	Assessment methods should closely reflect workplace demands (e.g. literacy) and the needs of particular groups (e.g. people with disabilities, and people who may have literacy or numeracy difficulties, such as speakers of languages other than English, remote communities and those with interrupted schooling).
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUVPHI516A Research the role and use of the photo image in visual communication • CUVPHI517A Research and exploit photo imaging trends.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Historical, contemporary and emerging imaging technologies may include:	• camera-less imaging processes and devices:
	  • digital scanners
	  • photocopiers
	  • photograms and chemigrams
	• cameras:
	  • aerial
	  • low-tech (toy and single use)
	  • panorama
	  • pinhole cameras and camera obscura devices
	  • rangefinder
	  • SLR, including 35mm/120 film and digital capture/sensor
	  • underwater
	  • view camera (4 x 5, 5 x 7, 10 x 8)
	• devices that produce books, magazines and newspapers
	• enhancement technologies:
	  • analog and wet darkroom
	  • digital darkroom and imaging software applications
	• historical cameras and techniques:
	  • ambrotype
	  • cyanotype
	  • daguerreotype
	  • Van Dyke brown and salted papers
	  • wet plate
	• hybrid processes:
	  • digital back on a pinhole camera
	  • simulating and emulating analog effects via digital software techniques
	  • using an inter-negative from digital capture for contact printing processes (e.g. cyanotype, palladiotype and platinotype)
	• output technologies, including all kinds of print-making, presentation and projection devices:

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	• analog and digital enlargers and printers/papers • film writers • inkjet, laser, dye-sublimation and thermal printers and media • CMYK offset printing devices • monitor/television screen display and/or data projector images • screen printing and print-making processes • thermo-autochrome (e.g. pictograph).
Appropriate people may include:	• critics, commentators and polemicists • members of relevant professional associations • mentors and peers • practising photographers, photo imagists and members of allied fields.

Discipline, subject matter and themes may include:	• disciplines:
	  • art photo images
	  • commercial photo images
	  • domestic photo images
	  • illustrative photo images
	  • media photo images
	  • stock photo images
	  • technical photo images
	  • wedding clients
	• subject matter and themes:
	  • abstraction
	  • advertising
	  • beauty
	  • culture
	  • gender identity
	  • landscape
	  • nature
	  • philosophical and classical themes
	  • religion
	  • reportage
	  • science and technology
	  • sexuality
	  • social issues
	  • the human condition
	  • the nude
	  • the photograph as truth

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	• the portrait.

Visual representation, attributes and opportunities may include:	• controlling and displaying time
	• imaging the passage of time
	• integrating images into other technologies to provide a range of audio, sensory and tactile human experiences
	• making images in which an emotive or emotional content is enabled by the selected imaging technology
	• making images of subjects in environments that are too hot or cold, or too dangerous or life threatening for human observation
	• pictorial representation of subjects normally beyond human vision, comprehension or understanding:
	  • making images where abstract concepts are explained using the representational opportunities provided by selected imaging technologies
	  • making minute things visible to the naked eye
	  • making subjects of immense distance visible
	• presenting images in ways that enhance the communicative quality of the work.

Specialised imaging technologies may include:	• aerial cameras
	• high speed cameras
	• non-visible electromagnetic spectrum:
	  • ultraviolet and infra-red imaging
	  • x-ray and gamma ray
	• microscopy
	• photo finish cameras
	• remote sensing devices
	• scanning electron microscopes
	• telescopes
	• thermal imaging
	• three-dimensional imaging devices and software applications
	• time and motion cameras
	• ultrasound imaging.

Body of work may include:	• electronic presentation • exhibition of images • magazine, newspaper or book • portfolio of work.

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Unit Sector(s)

Visual communication – photo imaging

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CUFDIG504A Design games

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design games and document the process for developing them. Game design requires a high degree of collaboration between script writers, programmers and graphic designers. Low-end games can be constructed using interactive authoring tools, but for video game productions, designers need to work with high level programmers to ensure that designs are technically feasible. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	A lead designer typically applies the skills and knowledge described in this unit, which relate to generating and then working on a game idea until the mechanics and design of the game are fully documented. A lead designer communicates the vision for a game to the rest of the team, takes ideas submitted during design meetings and analyses them to ensure they fit the game's intended objectives. This vision is captured in the game design document. Depending on the size of an enterprise, a lead designer may supervise assistant or level designers and would typically report to a design or creative director. Skills associated with story-telling are covered in: • CUFWRT402A Write extended stories.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify project requirements	1. Confirm the objective and desired outcomes of a game proposal or brief in consultation with ***relevant personnel*** 2. Identify ***factors*** that may have an impact on how a game is designed 3. Clarify target audience to determine format and ***delivery platform*** of the game through discussion with relevant personnel
Research games and generate ideas	4. Select ***state of the art games*** from different genres to play as a source of inspiration 5. Search ***game literature*** for each game and identify the games' objectives 6. Generate range of ideas for game designs that are technically feasible, respond to the proposal or brief, and provide creative solutions to design issues 7. Discuss ideas and collaborate, as required, with relevant personnel to ensure contribution of a range of ideas and creative solutions to initial concepts
Select a game genre	8. Identify and present a range of ***game genres*** to relevant personnel for consideration in terms of their characteristics, differences and ability to meet requirements of proposal or brief 9. Consult with relevant personnel to ensure that a full range of genres has been identified and sourced 10. Select the game genre that best meets the creative, technical and production requirements of proposal or brief
Draft game design document	11. Establish the game strategy outcomes 12. Use ***design techniques*** to develop the structure of a game ensuring that all elements, including style and ***game mechanics***, are fully documented 13. Use a range of ***criteria*** to determine the scope of a prototype to be used in the development phase 14. Ensure that the prototype selected is capable of ***testing the effectiveness*** of the proposed game 15. Include a register of ***game assets*** in consultation with relevant personnel 16. Present draft ***game design document*** for discussion with and feedback from other team members
Finalise game design	17. Re-evaluate game design objectives on the basis of feedback on the prototype and draft game design

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ELEMENT	PERFORMANCE CRITERIA
document	document 18. Discuss and confirm additional requirements or modifications to the game design with relevant personnel 19. Specify the game ***production specifications***, including appropriate ***testing strategies*** 20. Write final game design document to reflect all additional requirements or modifications

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written proposals and creative briefs
  - work collaboratively in a team environment
  - present game design ideas for discussion and feedback from team members
  - document game design specifications clearly and concisely
- initiative, enterprise and creativity in the context of:
  - generating innovative ideas for game designs
  - thinking laterally when developing concepts
  - undertaking background research into game ideas
  - maintaining design integrity
- technical skills sufficient to create complex designs using storyboards, maps and other diagrams to specify the architecture and navigation of game mechanics
- self-management skills sufficient to:
  - meet deadlines
  - provide appropriate and timely documentation

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - sound understanding of game theory, including traditional games
  - broad range of game genres and styles
  - technical parameters of various games platforms
  - issues and challenges that arise in designing games
- research methods for staying abreast of the latest changes and design enhancements
- requirements of game play design documents
- typical formats and techniques for documenting game designs
- intellectual property rights and copyright clearance procedures
- OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • development of original and innovative concepts for games • design of game play methods that are compelling for the user and technically feasible • production of clear and well-presented game design documentation • ability to work effectively as a member of a design team.
Context of and specific resources for assessment	Assessment must ensure: • practical demonstration of skills through the design of a variety of games for at least two platforms • access to game proposals or briefs on which designs can be based • access to a range of games for viewing • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of game designs documented by the candidate and of their quality in terms of meeting creative briefs • written or oral questioning to test knowledge as listed in the required skills and knowledge section of this unit • case studies to assess ability to develop designs for different types of games.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFPPM404A Create storyboards • BSBCRT501A Originate and develop concepts.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• art director • client • designers • director • graphic artist • head of department • producer • programmer • publisher • script writer • software engineer • other technical and creative staff.

Factors may include:	• availability of personnel
	• availability of resources
	• available budget
	• complexity of proposed game
	• intellectual property
	• need to attract finance
	• production schedule
	• production values
	• technical parameters, including:
	  • technology constraints
	  • console
	  • platform
	  • bandwidth
	  • memory/RAM
	• timelines
	• user and audience.

Delivery platforms may include:	• CD/DVD • digital television set • games console • internet

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RANGE STATEMENT	
	• mobile phone • personal digital assistant (PDA) • other wireless/mobile devices.
State of the art games may include:	• best selling games • games that show unique and innovative approaches.
Game literature may include:	• game design books • game post-mortems • magazine, newspaper and journal articles • previews and reviews • strategy guides • user manuals • walkthroughs • other online game resources.
Game genres may include:	• adventure • arcade • first person shooter • massively multiplayer online • mazes • platforms • puzzles • racing • rhythm • role playing • simulation • sport • strategy • third person shooter.
Design techniques may include:	• drawing • flow chart • scanning • storyboard • using image and background generating tools.

Game mechanics may include:	• environment and object interactions
	• environment dynamics
	• game objects
	• game play elements that may include:
	  • skill levels
	  • judgements

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RANGE STATEMENT	
	• choices • decisions • codes • rules • levels of progression • goals • actions • events • levels of difficulty • scoring • calculation of scoring • user control • user interaction • options for single player or multiplayer • customisation • key systems • object actions • object to object interactions.
Criteria may include whether the prototype:	• can be demonstrated to a specialist target group • can be used for promotional purposes • can demonstrate the full potential of the game • can sell a concept to potential investors • is appropriate for the chosen genre and style.
Testing the effectiveness of the prototype may include:	• comparing game design with original objectives • group discussion techniques • identifying any logical inconsistencies in: • design • game timing • story-lines • measuring the levels of user satisfaction • paper and pencil techniques (dry running).
Game assets may include:	• animations • audio, including: • sound effects • dialogue • narration • music

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RANGE STATEMENT	
	• cut scenes • titles • video sequences.
Game design document may include:	• agent architectures • artificial intelligence • asset register • background story • comprehensive designs for each mission and level • decision-making systems • game mechanics • game tools • graphics • inventories • overview • production specifications • scripts • spatial design • storyboard and flow chart • synopsis • title • user interface • walkthroughs.
Production specifications may include:	• budget • intellectual property • levels of staff expertise • production schedule • production values • size and composition of the development team • technology constraints • testing strategies • timelines.
Testing strategies may include:	• alpha • beta • completion • continuous • milestone • prototype • staged.

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Unit Sector(s)

Unit sector	

Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFSOU301A Prepare audio assets

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare audio assets for inclusion in interactive media. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	The size of an enterprise or project determines who undertakes the role described in this unit. In a large-scale environment, the person responsible for this task would typically be supervised by an audio asset creator or audio engineer and an audio programmer or interactive media author. In a radio station, the prime focus of the task involves converting radio programs into podcast material or in a form appropriate to streaming or downloading, and this may be a dedicated role under the supervision of a producer. In a smaller enterprise or project, an audio programmer, interactive author or audio/sound engineer would absorb this task into their role. In all cases, they are collaborating closely with other team members. Skills associated with other aspects of audio/sound production at this level are covered in: • CUSSOU201A Assist with sound recordings • CUFSOU204A Perform basic sound editing.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify audio assets	1. Obtain analogue or digital sources of audio 2. Identify the ***source file formats*** 3. Identify the output ***purpose***, ***destination*** and ***platform*** 4. Discuss with ***relevant personnel*** the required ***output file format*** and ***audio codecs*** for specified bandwidths 5. Discuss with relevant personnel the appropriate ***audio encoding software***
Prepare audio assets	6. Open appropriate audio encoding software and load audio file 7. Eliminate or treat defects on sound recordings 8. Equalise sound output levels where necessary 9. Ensure duration of audio sequences meets that required by the specification, and adjust if necessary 10. Determine and apply appropriate audio codecs 11. Batch optimise audio files where possible 12. Save files in appropriate output file format using standard naming conventions
Package audio assets	13. Assign ***metadata tags*** if required 14. Group files logically in folder system using standard naming conventions 15. Store in share drive or repository for production team access

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to interpret and clarify written or verbal instructions
- ability to work as a member of a production team, both independently on assignment and under direction
- technical skills sufficient to:
  - use audio software to prepare audio sequences for inclusion in interactive media
  - manage files using standard naming conventions
  - apply appropriate metadata tags to describe files
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - basic understanding of the relationship between the technical and creative aspects and requirements of interactive media projects
  - features of a range of delivery platforms
  - basic understanding of what happens when audio files are compressed for inclusion in interactive media products
  - appropriate codecs for various platforms and destinations
  - digital audio source and output formats
  - equalisation techniques
- techniques for saving and preparing digital audio output to optimise file size
- OHS standards as they relate to working for periods of time on computers
- OHS principles of safe listening (including safeguards against hearing loss)

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • preparation of a range of audio sequences to be included in interactive media products that meet appropriate technical specifications • proficient use of audio encoding software.
Context of and specific resources for assessment	Assessment must ensure: • access to industry-current audio encoding software • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of audio assets prepared by the candidate on a number of occasions • written or verbal questioning to test knowledge of codecs for various platforms and understanding of file compression.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG301A Prepare video assets.

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Range Statement

RANGE STATEMENT	
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Source file formats may include:	• WAV • AIFF • AU • MP3 • WMA • AAC (Apple lossless) • OGG.

Purposes may include:	• audio sequences, e.g.:
	  • SFX (sound effects)
	  • music
	  • foley
	  • atmospherics
	  • dialogue
	  • additional dialogue, e.g. rerecorded and narration
	• audio sequences incorporated into a:
	  • website
	  • podcast
	  • game
	  • learning object
	  • interactive application
	  • animation.

Destinations may include:	• computer-based playback software, e.g. iTunes
	• downloading server
	• internet audio players, e.g.:
	  • Quicktime
	  • Windows Media Player
	  • RealPlayer
	• progressive downloading (buffering) server
	• streaming server.

Platforms may include:	• CD

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RANGE STATEMENT	
	• digital audio players (e.g. iPod, MP3) • DVD • games console • internet • kiosk • mobile phone • PDA (personal digital assistant).
Relevant personnel may include:	• audio engineer • clients • producer • programmers and technical support people • supervisor • other specialist creative and administrative personnel as appropriate.
Output file formats include:	• AAC (advanced audio coding) • AMR-NB • Apple lossless • MP3 • RAM • WMA.
Audio codecs may include:	• bit depth • bit sampling rates • mono or stereo • standardised and preset codecs.

Audio encoding software may include:	• audio editing tools, e.g.:
	  • Audacity
	  • Adobe Audition
	  • Pro Tools
	• specialised audio compression tools.

Metadata tags may include:	• album • artist • defaults • description • episode • resolution • track • version.

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Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - audio/sound

Co-requisite units

Co-requisite units		

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CUFSOU204A Perform basic sound editing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to for basic digital sound editing. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	Assistant sound editors and production personnel in the community broadcasting sector apply the skills and knowledge described in this unit. They are responsible for preparing, organising and digitally editing relatively simple sound sequences or programs for radio, television, film and interactive media. They are expected to contribute to creative outcomes, including selection and acquisition of sound materials. In a production house environment, they typically work under the supervision of a picture editor or senior sound editor, and are often involved in editing both sound and vision. Combined editing skills at a basic level are covered in: • CUFPOS201A Perform basic vision and sound editing. More complex skills associated with editing sound, including dialogue, are covered in: • CUSSOU403A Perform advanced sound editing.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare for editing sound	1. In consultation with relevant ***production personnel***, clarify editing requirements, including creative and technical expectations of ***productions*** 2. Obtain and label ***source materials*** and ***additional materials*** as required and keep them in a safe, clean location with appropriate ***documentation*** 3. Organise transfer of source materials to appropriate equipment where necessary, ensuring sufficient ***digital storage*** capacity is available 4. Check ***editing equipment*** is operational and suited to the designated editing processes and according to enterprise procedures 5. Organise ***additional equipment*** and ***consumables*** needed to minimise interruptions during the editing process 6. If required, obtain sign-off to proceed with edits
Assemble sequences for editing	7. Digitise ***audio content*** and additional sound materials in the specified ***format***, ensuring format is compatible with available ***software*** and editing equipment 8. Monitor digital output and arrange for problems to be fixed where necessary 9. Identify ***sound edit*** positions using appropriate documentation and optimise quality where applicable 10. Log and assess ***sound sequences*** according to ***production requirements*** and arrange digital back-up copies as insurance against editing errors 11. Consider how materials may be edited efficiently to meet ***technical and creative criteria***
Edit sound sequences	12. Edit audio sequences according to production requirements and accurately document ***details*** of each edited sound sequence 13. Generate an appropriate track list to facilitate subsequent stages of sound mixing processes 14. Accurately chart positions and durations of sound sequences, noting requirements for transitions where applicable 15. Apply effects and digital enhancements to maximise creative outcomes of sound sequences according to production requirements 16. ***Manipulate editing software and equipment*** to produce

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ELEMENT	PERFORMANCE CRITERIA
	required sequences and to resolve identified problems 17. Seek feedback on work in progress from relevant production personnel and refine edits as required 18. Submit final edits by the agreed deadline in accordance with enterprise procedures
Finalise sound edits	19. Archive edited audio files and complete associated documentation according to enterprise procedures 20. Advise relevant production personnel of editing equipment requiring maintenance and leave workstation in original or improved condition 21. Participate in post-production debriefing sessions as required 22. Evaluate own performance against technical and creative criteria and discuss with colleagues where appropriate

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and organisational skills sufficient to:
  - arrange sound media logically and accurately
  - liaise with relevant production personnel
  - understand and follow instructions
- technical skills sufficient to:
  - edit a range of audio sequences and segments
  - digitise pre-recorded content, e.g. digital and analogue audio, sound effects
  - change audio from one format to another
  - follow relevant file management protocols for specified operating systems
  - identify faults that occur in audio production environments
- initiative and enterprise in the context of editing sound to meet creative production requirements
- aural discrimination skills in the context of listening critically to, and enhancing the quality of, sound elements and sequences
- self-management skills sufficient to:
  - prioritise work tasks and meet deadlines
  - seek expert assistance when problems arise
- literacy and numeracy skills sufficient to:
  - identify and label accurately source materials and copies
  - read and interpret sound documentation and plans
  - implement and record codes and timings
  - document sound components, e.g. maintenance of logging sheets

Required knowledge

- familiarity with basic sound editing conventions, practices and techniques
- editing and audio terminology
- understanding of the roles and skills associated with other post-production personnel
- sound editing software and equipment for both broadcast and non-broadcast
- varied characteristics of sound in a range of environments
- OHS standards in relation to:
  - using a computer and keyboard for periods of time
  - observing safe noise levels

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • a range of digitally edited sound sequences that meet production requirements • collaborative approach to work • attention to detail • ability to work to deadlines.
Context of and specific resources for assessment	Assessment must ensure: • access to a range of pre-recorded sound footage • access to industry-current sound editing software as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of sound sequences edited by the candidate in response to instructions received from a supervising editor • observation of the candidate preparing and editing sound sequences • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFPOS201A Perform basic vision and sound

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EVIDENCE GUIDE	
	editing • CUFSOU301A Prepare audio assets • CUFSOU302A Compile audio material for broadcast.

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Range Statement

RANGE STATEMENT	
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Production personnel may include:	• assistant editor • broadcasters • CGI (computer generated imagery) personnel • director • musicians • producer • production manager • sound designer • sound editor • sound effects personnel • sound engineer • sound recording studio personnel • station manager • supervisor • technical director • volunteers coordinator • other technical/specialist personnel.
Productions may include:	• animated productions • CD/DVD • commercials • documentaries • feature films • features - television and film • filmed events or performances • interactive media products • music • music videos • news and current affairs • podcasts • promotional trailers • radio broadcasts • short films • television programs, e.g.:

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RANGE STATEMENT	
	• music • drama • comedy • variety • sport • websites.
Source materials may include:	• archival recordings • atmosphere • CD/DVD recordings • foley effects • live captured effects • music • SFX (sound effects) • synthesised sound • voice recordings/dialogue.
Additional materials may include:	• archival sound footage • file images • stock sound footage.
Documentation may include:	• assembly order • computer generated • duration print-outs • EDLs (edit decision lists) • fault reports • hire agreements • list of sequences with relevant shot numbers • log sheets for location • manually written • marked-up scripts • marked-up transcripts • memos of instruction • operational/project plan • production schedules • scripts • sound recordings • sound/audio reports • wild-line and sound effects log sheets.
Digital storage may include:	• cassettes • CD • DAT

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RANGE STATEMENT	
	• DMSS (digital mass storage systems) • DVD • hard disks • internal sound cards • magneto-optical • optical • tape.
Editing equipment may include:	• amplifiers • audio converters • audio desk/mixers • CD player/burner • CDs • DAT (digital audio tape) • digital and analogue recording devices • digital non-linear (online) editing systems • DVDs • effects rack • hard disk recorder • headphones • linear (off-line) editing systems • mini disks • mixing console/desk analogue, digital, digitally controlled analogue (hybrid) • sequence sampler • speakers • tape machines.
Additional equipment may include:	• cassette player/recorder • CD player/recorder • DVD player/recorder • headphones • iPod • microphones • sound cables • speakers.
Consumables may include:	• computer disks • labels • marker pens • mini disks • sound tapes, e.g.: • DAT

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RANGE STATEMENT	
	• cartridge • compact audio cassette • reel-to-reel • 16 mm magnetic.
Audio content may include:	• atmosphere recordings • dialogue • foley effects • interviews • live recordings • music • sound effects • synthesised audio.

Formats may include:	• audio/sound, e.g.:
	  • DAT
	  • AIF (AIFF)
	  • WAV
	  • WAV (BWF - broadcast WAV format)
	  • WMA
	  • MIDI
	  • OGG
	  • AAC (advanced audio coding)
	  • Apple lossless
	  • magnetic tape
	  • Real Audio
	  • QuickTime
	  • MP3
	• computerised data.

Software may include:	• after effects package
	• computer programs, e.g.:
	  • Pro Tools
	  • Sound Forge
	  • Adobe Audition
	  • Final Cut Pro
	  • Adobe After Effects
	• EDL software
	• freeware
	• shareware.

Sound edit may include:	• computerised data

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RANGE STATEMENT	
	• digital non-linear • edit of rough and fine cuts • edit of source and recorded materials • film and video audio assets • initial edit of sound rushes • integration of the picture (image) editing process to ensure sound and picture are in sync • linear • off-line • on-line.

Sound sequences may include:	• atmosphere tracks
	• dialogue
	• foley effects
	• music
	• sound effects tracks that have been:
	  • pre-recorded (using sound effects libraries)
	  • recorded live (foley sound effects, production sound effects)
	  • electronically generated (synthesised/computer generated sound effects)
	• voice-overs.

Production requirements may include:	• ADR (additional dialogue recordings) • aesthetic • atmosphere tracks • durations • effects • music • technical • vision and sound edit • voice-overs.
Technical and creative criteria may include:	• ADR (additional dialogue recordings) • audio levels • balance between track levels • balance of background music • compression factors, e.g. codecs • consistency of voice levels • continuity of background ambience in location recordings • distortion

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RANGE STATEMENT	
	• durations • editorial requirements • enhancement of visual images • foley • natural pausation • sound balance, e.g. music • synchronisation of sound and vision.
Details may include:	• copyright details • durations • in and out points • quality assessment • source details • specific content • take options • technical notes.

Manipulating editing software and equipment may include:	• adjusting and normalising audio levels
	• inserting, e.g.:
	  • transitions
	  • sound effects
	  • music
	  • voice-overs
	  • overlays
	• manipulating audio clips, e.g.:
	  • cutting
	  • pasting
	  • copying
	  • moving
	  • splitting.

Unit Sector(s)

Unit sector	

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Competency field

Competency field	Media and entertainment production - audio/sound

Co-requisite units

Co-requisite units		

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CUFDIG507A Design digital simulations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design digital simulations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

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Application of the Unit

Application of the unit	The range of digital simulations covered in this unit is broad, and could include virtual world environments for architecture; virtual instruments and equipment for science and engineering; or natural and technical processes and procedures in medicine, conservation and manufacturing. As these simulations are based on real world environments and processes, designers need to work closely with experts in the field to understand the dynamics of the processes and to be able to model these in a virtual environment. The unit also requires working collaboratively with programmers and software authors to ensure the simulation can be technically achieved. As the application for simulation is broad, including demonstration and training, this unit relates to other design units, including: • CUFDIG503A Design e-learning resources • CUFDIG504A Design games.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Identify project requirements	1. Confirm objectives and desired outcomes of briefs in consultation with ***relevant personnel*** 2. Identify target audience and determine format and ***delivery platform*** of simulations through discussion with relevant personnel
Research and plan approach	3. Investigate fully the ***real world environment*** that is to be simulated 4. Obtain designs, plans and other information that may assist in modelling the real world environment 5. Determine the ***performance objectives***, task complexity and required levels of user skill 6. Determine the required depth of physical and functional fidelity, taking into account ***production requirements*** 7. Research and select appropriate simulation ***authoring tools*** 8. Discuss ideas and collaborate, as required, with relevant personnel to ensure contribution of a range of ideas and creative solutions
Draft simulation design documents	9. Identify the ***processes*** that determine the functional behaviour and specify how this behaviour is to be represented by ***control objects*** 10. Define the underlying functionality in a model that specifies the essential settings, states, conditions and parameters 11. Specify the ***user interface controls*** that enable users to interact with simulations 12. Identify critical impacts, alerts or costs for incorrect user operation 13. Specify positive and negative user feedback 14. Specify the sequencing of levels of difficulty 15. Present draft ***simulation design documents*** for discussion with and feedback from other team members
Finalise simulation design documents	16. Review designs against required project outcomes and performance objectives 17. Review designs to ensure they meet creative, technical and legislative requirements 18. Adjust designs as necessary after discussions with relevant personnel and incorporating user feedback 19. Save and archive user interface controls for other

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ELEMENT	PERFORMANCE CRITERIA
	projects

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify project briefs
  - establish rapport with clients
  - work collaboratively in a team environment to find the best design solutions
  - clearly and concisely document specifications for the design of the digital simulation
- initiative and enterprise in the context of:
  - generating ideas for the design of digital simulations that meet the specified performance objectives
  - thinking laterally when developing ideas
  - maintaining design integrity
- technical skills sufficient to:
  - create storyboards, state-charts and other diagrams to specify the architecture and navigation of digital simulations
  - design simulations that represent a real world environment to the required level of fidelity
- self-management skills sufficient to:
  - meet deadlines
  - provide appropriate and timely documentation

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members, e.g. designers, content creators, information architects, programmers and coders
  - issues and challenges that arise in the context of designing and developing digital simulations
- typical formats and techniques for documenting the design of digital simulations
- OHS standards as they relate to working for periods of time on computers
- way in which algorithms, laws, rules and mathematical formulas can represent real world processes
- intellectual property rights and copyright clearance procedures

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• design specifications for digital simulations that:
	  • are well documented and clearly presented
	  • meet performance requirements
	  • are technically feasible
	• ability to work effectively as a member of a design team.

Context of and specific resources for assessment	Assessment must ensure: • practical demonstration of skills through the design of at least two digital simulations • access to briefs for digital simulations on which designs can be based • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of digital simulation designs documented by the candidate and of their quality in terms of meeting performance requirements • written or oral questioning to test knowledge as listed in the required skills and knowledge section of this unit • case studies to assess ability to develop digital simulations for a range of real world environments.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended,

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EVIDENCE GUIDE	
	for example: • CUFDIG503A Design e-learning resources • CUFDIG504A Design games • CUFDIG506A Design interaction.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• art director • client • designer • expert • graphic artist • head of department • programmer • publisher • script writer • software engineer • other technical and creative staff.
Delivery platforms may include:	• CD/DVD • games console • internet • mobile phone • personal digital assistant (PDA) • other wireless/mobile devices.
Real world environments may include:	• device • equipment • machine • natural habitat • procedure • process • social environment • spatial environment • system • tool.
Performance objectives may include:	• control • dexterity • judgement • knowledge • memory

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RANGE STATEMENT	
	• perception • proficiency • recall • reflection • speed and accuracy of decision making and problem solving • understanding.
Production requirements may include:	• budget • schedules • staff expertise • timelines.

Authoring tools may include:	• authoring software, such as:
	  • Dreamweaver
	  • GoLive
	  • Contribute
	  • Breeze
	  • Captivate
	  • Authorware
	  • Flash
	  • Director
	  • PageMill
	  • RoboDemo
	  • simulation software, such as LabView
	• scripting using languages, such as:
	  • CC++
	  • Java
	  • ActionScript
	  • Lingo.

Processes may include:	• astrological • biological • chemical • electrical • environmental • mechanical • mental • physical • social.
Control objects may include:	• algorithms • forces

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RANGE STATEMENT	
	• laws • mathematical formulas • rules.
User interface controls may include:	• buttons • clocks • dials • gauges • handles • joysticks • keyboards • keypads • knobs • lamps • levers • meters • sliders • switches • timers • valves • wheels.
Simulation design documents may include:	• diagrams • flow charts • maps • plans • state-charts • storyboards • technical specifications • user interface mock-ups • wire frames.

Unit Sector(s)

Unit sector	

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Competency field

Competency field	Visual communication - digital content and imaging

Co-requisite units

Co-requisite units		

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CUFPOS201A Perform basic vision and sound editing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to perform basic editing functions in relation to film, television and interactive media productions. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	Editing assistants apply the skills and knowledge described in this unit. Under the direction of an editor or senior editor, they are responsible for digitising, cutting and logging pre-recorded image and audio content. Editors then take this material and complete the editing process. Within clearly defined parameters, editing assistants are also responsible for editing content using the basic functions of editing software. More complex skills associated with digital editing are covered in: • CUFPOS401A Edit screen content for fast turnaround.

Licensing/Regulatory Information

Not applicable.

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare source materials for edit	1. Clarify ***technical and creative requirements*** for ***production*** and online ***editing*** in consultation with relevant ***production personnel*** 2. Obtain and label ***source materials*** and keep in a safe, clean location with appropriate ***documentation*** 3. Organise transfer of source materials to appropriate ***medium*** where necessary 4. Check that sufficient ***storage and memory*** is available to meet content resolution requirements 5. Assess source materials for technical and creative quality and arrange for remedial action where problems are identified 6. Digitise content according to specified ***formats*** and burn time code where applicable, ensuring format is compatible with available ***software*** and ***hardware*** 7. Align, synchronise and organise uncut images and sound in preparation for evaluation and editing 8. In consultation with relevant production personnel, finalise list of shots required for the edit and the method for logging them
Log content for editing	9. Check ***editing facilities*** are operational and arrange for faults or problems to be resolved according to enterprise procedures 10. Obtain required editing ***consumable materials*** and ensure sufficient supplies are available to meet editing schedules 11. Load source materials onto appropriate editing facility, ensuring correct image and sound are ready for use and that images and sound are synchronised or aligned accurately 12. Identify required ***shots*** and sequences from source materials and catalogue them in the agreed way 13. ***Log*** selected edits with reference to ***time codes*** and shot descriptions according to enterprise procedures 14. Use a batch digitise list to digitise selected sequences according to relevant documentation and consistent with technical and creative requirements 15. Create ***edit decision lists*** (EDLs) according to instructions from relevant production personnel 16. Organise and save selected materials according to overall editing requirements

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ELEMENT	PERFORMANCE CRITERIA
	17. Finalise logging sheets and submit EDLs to relevant production personnel by the agreed deadline
Perform basic edits	18. Use ***software functions*** to assemble sequences according to EDLs and within time constraints 19. Review edited sequences to evaluate quality and content and to identify problems 20. Manipulate the editing software to solve identified problems and seek expert advice if required 21. Submit sequences to relevant production personnel for feedback according to enterprise procedures 22. Amend sequences as required and save in appropriate format 23. Ensure source materials, selected materials and back-up copies are stored securely and labelled correctly 24. Complete required documentation, noting variations and issues from original instructions 25. Leave workstation in original or improved condition, ensuring there has been no adverse impact on site

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and organisational skills sufficient to:
  - arrange film, television and interactive media content logically and accurately
  - liaise with relevant production personnel, e.g. editors, directors
  - understand and follow instructions as required
- technical skills sufficient to:
  - edit simple image and audio sequences and segments, including dialogue
  - digitise pre-recorded content, e.g. film, analogue video
  - follow relevant file management protocols for specified operating systems
- self-management skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise
- literacy and numeracy skills sufficient to:
  - identify and label accurately source materials and copies
  - implement and record time codes and timings
  - document image and sound components, e.g. completion of logging sheets

Required knowledge

- familiarity with basic picture and sound editing conventions and techniques
- industry knowledge, including:
  - roles and responsibilities of post-production personnel
  - basic understanding of the features and capabilities of facilities and equipment for sound editing and broadcast
  - working knowledge of a range of editing software and equipment
- OHS requirements as they apply to use of computers and keyboards

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • systematic preparation of content segments for editing from source video or film • correct identification and logging of single images, audio grabs and basic sequences • ability to transfer and digitise video and film materials • collaborative approach to work • attention to detail • ability to work to deadlines.
Context of and specific resources for assessment	Assessment must ensure: • access to a range of pre-recorded films and videos • availability of a range of editing facilities - non-broadcast and broadcast • exposure to a range of computer software for editing and documentation of image and audio • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a range of material prepared, logged and edited by the candidate in response to instructions received from a supervising editor • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.
Guidance information for	Holistic assessment with other units relevant to the

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EVIDENCE GUIDE	
assessment	industry sector, workplace and job role is recommended, for example: • CUFDIG301A Prepare video assets • CUFSOU204A Perform basic sound editing • CUFSOU301A Prepare audio assets.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Technical and creative requirements may include:	• ADR (additional dialogue recording)
	• audio levels
	• break in control track
	• colour bars
	• drop-outs
	• film leaders
	• graphics
	• production style
	• quality of image/sound
	• rushes
	• script materials
	• sequences, e.g.:
	  • vision cuts
	  • sound editing, e.g. dialogue
	  • voice-over
	  • music
	• sync marks
	• tape black
	• time codes.

Productions may include:	• animated productions • commercials • documentaries • feature films • filmed events or performances • music video • pre-recorded television productions • short films • television productions, e.g. music, drama, comedy, variety, sport.
Editing may include:	• computerised data • digital non-linear • film

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RANGE STATEMENT	
	• linear • off-line • online • video.
Production personnel may include:	• assistant editor • CGI (computer generated imagery) personnel • designers • director • director of photography • editing suite personnel • editor • floor manager • laboratory personnel • music composer • picture editing personnel • producer • production designer • production manager • sound editing personnel • sound effects personnel • technical director • other technical/specialist staff.
Source materials may include:	• CDs • DVDs • film • graphics • internet • mini disks (MDs) • stills • tape (analogue; camera, digital) • work prints • work tapes.
Documentation may include:	• assembly order • budgets • call/running sheets • camera reports • computer generated • continuity reports • contracts • EDLs (edit decision lists)

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RANGE STATEMENT	

	• fault reports
	• hire agreements
	• list of sequences with relevant shot numbers
	• logging sheets
	• manually written
	• manufacture schedules
	• manufacturer specifications/instructions
	• marked-up scripts
	• marked-up transcripts
	• memos of instruction
	• operational/project plan
	• production schedules
	• scripts
	• sound reports
	• sound sheets, e.g.:
	  • time-code log sheets for location sound recordings
	  • wild-line and sound effects log sheets.

Medium may include:	• computer disk, e.g. CD/DVD
	• film of any gauge, e.g.:
	  • 16 mm
	  • 35 mm
	  • super 35 mm
	  • 70 mm
	• mini disk
	• sound
	• video of any format, e.g.:
	  • miniDV
	  • DVCam
	  • Betacam
	  • SP and digital Betacam
	  • VHS/SVHS
	• vision.

Storage and memory may include:	• disk space (hard, optical, floppy) • film duplicates • flash memory, e.g. USB drives • solid state, e.g. RAM.
Formats may include:	• audio/sound, e.g.: • DAT

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RANGE STATEMENT	
	• AIFF • WAV • MIDI • MP3 • magnetic tape • computerised data • film of any gauge • graphics • stills • video of any format, e.g.: • DVC • VHS • Beta • HDTV • AVI • MPEG.
Software may include:	• Adobe Premiere Pro • Avid Liquid Pro • Final Cut Pro • Ulead MediaStudio Pro.
Hardware may include:	• computers, e.g. PC, Macintosh, Avid • DVD/CD player • edit controllers, e.g. Lightworks • external hard drives • iPod • source and record machines, e.g. Beta, VHS, DAT • Steenbeck • video machines/recorders.
Editing facilities may include:	• digital non-linear, e.g. Mac G5, Avid • editing bins • linear, e.g. Steenbeck, Beta, VHS • off-line • online • pic sync • rewinders • synchronisers • viewers.
Consumable materials may	• audio tape

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RANGE STATEMENT	
include:	• computer disks • DVDs • film cans • labels • marking pens • video/DVD cases • viewer globes.
Shots may include:	• bird's eye • close-ups • cutaways • high-angle, low-angle • long shot, mid shot • medium close-ups • noddy • pans • reverses • tilts • two shot • wide shots • wide-angle.
Log may include:	• can ID • counter reading • drop-outs/faults • in point • out point • shot descriptions • tape ID • time code • timings.
Time codes may include:	• burned-in code • clapperboard/slate • frame rates • genlock • keyed-in code • LTC (longitudinal time code) • SMPTE/EBU • synchronisers • time-code rates • VITC (vertical interval time code).

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RANGE STATEMENT	

Items to be noted in ***edit decision lists*** may include:	• composition
	• coverage
	• dialogue
	• effects transitions, e.g.:
	  • wipes
	  • dissolves
	  • fades
	  • use of graphics
	• frame ratio and rate
	• framing
	• glitches, faults, drop-outs
	• music
	• pacing
	• script changes
	• soundtrack
	• special effects
	• tempo - duration of shots and segments
	• timing.

Software functions may include:	• adjusting audio levels
	• inserting:
	  • transitions
	  • sound effects
	  • music
	  • voice-overs
	  • basic titles and captions
	  • still images
	  • overlays
	• manipulating still images, e.g.:
	  • panning
	  • zooming
	• manipulating video and audio clips, e.g.:
	  • cutting
	  • pasting
	  • copying
	  • moving
	  • splitting.

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Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - post-production

Co-requisite units

Co-requisite units		

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CUFPOS401A Edit screen content for fast turnaround

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to edit screen content for fast turnaround using non-linear editing facilities. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	Editors with a reasonable level of experience apply the skills and knowledge described in this unit. Using non-linear digital facilities to edit screen content, editors occasionally require basic film handling skills. Primarily they are involved in day-to-day editing for daily programs such as news and current affairs. At times they work on more complex programs of a formatted or routine nature. They may also be involved in fast turnaround editing of rushes for feature films. Editors at this level are usually answerable to a senior editor or producer/reporter. More complex skills associated with editing a comprehensive range of film, television material are covered in: • CUFPOS501A Edit complex screen productions.

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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare for edit	1. Clarify editing requirements in consultation with relevant ***production personnel*** and with reference to ***documentation*** as required 2. Check operation of ***editing equipment*** and ***software***, and ensure sufficient supplies of ***consumables*** are available 3. Identify and prepare ***source materials*** for off-line and online ***editing*** 4. Assess materials to be edited for required ***technical and creative criteria*** in consultation with relevant production personnel 5. Endeavour to visualise completed edit with reference to available materials
Commence editing process	6. Digitise and transfer materials to suitable ***format***, ensuring compatibility with editing equipment and monitoring capture for sound and image quality 7. Where appropriate, create an ***edit decision*** list (EDL) subject to time constraints, noting accurately in and out points for each edit 8. Maintain accurate documentation of editing instructions for use in all stages of post-production as required 9. Prioritise and select materials in terms of their relevance to meet ***production requirements*** 10. Arrange and present selected material to retain the intended meaning of words and images 11. Analyse and plan how preselected ***additional materials*** are to be used to clarify and enhance final edit
Assemble vision and sound	12. Check technical and creative criteria with relevant production personnel to ensure integrity of edit 13. Assemble content in a way that produces coherent images and sound according to standard ***editing conventions*** 14. Ensure that assembled materials meet time requirements for ***productions***, as well as technical and creative criteria for transmission 15. Insert transitions, special effects and preselected additional materials as required 16. Make appropriate compromise between content and quality in order to meet time restrictions 17. Review assembled online or off-line edit with relevant production personnel

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ELEMENT	PERFORMANCE CRITERIA
	18. Implement changes as specified and finalise edit to meet deadlines
Finalise edits	19. Complete necessary documentation and file/archive source materials according to enterprise procedures 20. Report problems in completing edits to meet production requirements 21. Provide information required for successful transmission of edited material 22. Evaluate own performance against technical and creative criteria and discuss with colleagues where appropriate

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and organisational skills sufficient to:
  - arrange screen content logically and accurately
  - work collaboratively with production personnel, e.g. editors, directors
  - understand and carry out instructions and creative directions as required
  - utilise relevant file management protocols for specified operating systems
- initiative and enterprise in the context of:
  - visualising and interpreting basic story-lines in a creative way
  - troubleshooting and solving problems as they arise during the editing process
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance as required
- technical skills in the context of:
  - editing vision and sound for same-day programs to tight deadlines, e.g. news, current affairs
  - editing content according to a broad brief, e.g. verbal brief
  - digitising pre-recorded content, e.g. film, analogue video
- literacy and numeracy skills sufficient to:
  - identify and label accurately source materials and copies
  - implement and record time codes and timings
  - document image and sound components, e.g. completion of logging sheets

Required knowledge

- current vision and sound editing techniques and application of different editing methods, especially when fast turnaround is required
- thorough knowledge of a range of editing software and equipment
- filmmaking conventions, such as camera shots, angles and viewpoint
- OHS requirements as they relate to working on computers for periods of time
- industry knowledge, including:
  - roles and responsibilities of production and post-production team members
  - sound understanding of the creative and technical elements of a range of film and media productions
  - features of industry-standard post-production facilities and equipment for broadcast and non-broadcast
  - broadcast language and terminology

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REQUIRED SKILLS AND KNOWLEDGE
• issues and challenges that arise in the context of editing vision and sound content for fast turnaround

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential:
	• effective editing of a range of vision and sound content that:
	  • meets production requirements
	  • takes account of technical and resource constraints
	• ability to edit material within tight time constraints
	• collaborative approach to work.

Context of and specific resources for assessment	Assessment must ensure: • access to real-time editing opportunities, together with a reasonable variety of assignments • access to a selection of editing software and equipment as listed in the range statement • opportunities to work with a range of vision and sound formats as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of a selection of material edited by the candidate for fast turnaround • observation of the candidate editing material for fast turnaround • written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG301A Prepare video assets • CUFSOU301A Prepare audio assets • CUSSOU403A Perform advanced sound editing.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Production personnel may include:	• assistant editor • camera operators • CGI (computer generated imagery) personnel • designers • director • floor manager • laboratory staff • producer • production designer • production manager • senior editor • sound editing personnel • sound effects personnel • technical director • other technical/specialist staff.
Documentation may include:	• assembly order • camera reports • computer generated • contracts • EDLs (edit decision lists) • fault reports • hire agreements • list of sequences with relevant shot numbers • manually written • manufacturer specifications/instructions • marked-up scripts • marked-up transcripts • memos of instruction • operational/project plan • production schedules • scripts • sound reports • sound sheets, including

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RANGE STATEMENT	
	• time-code log sheets for location sound recordings • wild-line and sound effects log sheets.
Editing equipment may include:	• computers • digital non-linear, e.g. Mac G5, Avid • editing bins • linear, e.g. tape to tape • off-line • online • pic sync • rewinders • synchronisers • viewers.
Software may include:	• after effects package • computer programs, e.g. Final Cut Pro • EDL software • freeware • Illustrator • Photoshop • shareware.

Consumables may include:	• computer disks
	• cotton gloves
	• film cans
	• film leader
	• labels
	• sound tapes of any format, e.g.:
	  • DAT
	  • cartridge
	  • compact audio cassette
	  • reel to reel
	• spare videotapes of any format, e.g.:
	  • DVC
	  • Beta
	  • VHS
	  • mini-DVD
	  • HDTV.

Source materials may include:	• audio tapes • camera tapes • CDs

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RANGE STATEMENT	
	• DVDs • film • graphics • internet • stills • work prints • work tapes.
Editing may include:	• computerised data • digital non-linear • film • linear • off-line • online • video.

Technical and creative criteria may include:	• ADR (additional dialogue recording)
	• audio levels
	• break in control track
	• broadcast quality
	• colour bars
	• drop-outs
	• film leaders
	• graphics
	• non-broadcast quality
	• production style
	• quality of image/sound
	• rushes
	• script materials
	• sequences, e.g.:
	  • vision cuts
	  • sound editing, e.g. dialogue
	  • voice-over
	  • music
	• shots, e.g.:
	  • wide shots
	  • mid shot
	  • close-ups and medium close-ups
	  • two shot
	  • long shot
	  • wide-angle

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RANGE STATEMENT	
	• high-angle • low-angle • bird's eye • pans • tilts • cutaways • two shots • noddy • reverses • sync marks • tape black • time codes.
Formats may include:	• audio/sound, e.g.: • DAT • AIFF • WAV • MIDI • magnetic tape • computerised data • film of any gauge • graphics • stills • video of any format, e.g.: • DVC • VHS • Beta • HDTV.
Editing decisions may include:	• action • composition • coverage • dialogue • frame ratio and rate • framing • glitches, faults, drop-outs • music • narration • pacing • script changes • shot composition

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RANGE STATEMENT	
	• soundtrack • special effects • timing • voice-overs.

Production requirements may include:	• ADR (additional dialogue recording)
	• aesthetic
	• animation
	• atmosphere tracks
	• durations
	• effects
	• graphics
	• music
	• production titles
	• technical
	• time code, e.g.:
	  • SMPTE/EBU
	  • burned-in code
	  • keyed-in code
	• voice-overs.

Additional materials may include:	• archival footage:
	  • sound
	  • image
	• file images
	• stock footage:
	  • sound
	  • image.

Editing conventions may include:	• action cutting (before, during and after the action) • consistency of style • continuity (crossing the line, eyeline) • cut away • cut in • cut out • fades and dissolves • freeze frame • jump cut • montage.
Productions may include:	• animated productions • commercials

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RANGE STATEMENT	

	• documentaries
	• feature films
	• features - television and film
	• filmed events or performances
	• live television
	• music video
	• news and current affairs
	• pre-recorded television productions
	• short films
	• television productions, e.g.:
	  • music
	  • drama
	  • comedy
	  • variety
	  • sport.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - post-production

Co-requisite units

Co-requisite units		

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CUFPOS402A Manage media assets

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to manage media assets for screen and media productions and projects. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	The skills and knowledge outlined in this unit are typically applied by a person working in a large enterprise on projects or productions that require a wide range of media assets. They work directly with asset creators (audio, video, graphics) to ensure that the asset management system accommodates their needs. Though reporting to a producer or manager, a person in this role works with a fair degree of autonomy. They are responsible for setting up the conventions for file naming, sourcing, sorting and storing formal documents and media assets, and recording project or production details. They also set up systems to manage these assets effectively. The systems may need to be built by other personnel within the enterprise or production.

Licensing/Regulatory Information

Not applicable.

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Establish systematic procedures for managing content and outputs	1. Confirm media asset management requirements with ***relevant personnel*** 2. Set up file naming system for ***projects*** based on standard conventions and protocols 3. Source and review storage repository and back-up systems appropriate for the task 4. Set up processes to record ***information*** required for tracking ***formal documents*** and ***media assets*** 5. Establish conventions for recording progress and locations of media assets 6. Develop strategy for tracking and recording media assets 7. Brief team members on the media asset management system, including the process for alerting relevant personnel to problems encountered as the system is implemented
Record information about documents and media assets	8. Document sources of media assets according to established procedures 9. Document progress and details of a range of outputs 10. Maintain records of technical information on work in progress 11. Maintain copyright and permissions information 12. Track media assets and record information according to established system 13. Maintain version control and identify status of interim products, prototypes and other relevant media assets 14. Respond to and resolve problems encountered as the system is implemented
Plan for project completion and storage	15. Confirm schedule for final sign-off with relevant personnel 16. Determine requirements for archiving 17. Confirm procedures for finalisation of projects
Finalise project	18. File and index formal documents according to agreed project or enterprise procedures 19. File and index scripts according to agreed project or enterprise procedures 20. Archive media assets in established system repository system according to industry practice 21. Ensure appropriate access by relevant personnel to formal documents and media assets developed by

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ELEMENT	PERFORMANCE CRITERIA
	projects 22. Review the effectiveness of the media asset management system and note areas for future improvement

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret project briefs
  - prepare and maintain media asset management documentation
  - provide verbal and written briefings to team members
  - work collaboratively as a member of a production team
  - provide advice and support to team members
- technical skills sufficient to track, maintain, record and archive information using accepted industry protocols
- initiative and flexibility in the context of anticipating and resolving problems with a media asset management system
- self-management and planning skills sufficient to:
  - set up and administer a file naming system
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance as required

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members in the relevant industry sector
  - sound understanding of the relationship between the technical and creative aspects and requirements of screen and media projects
  - issues and challenges that arise in the context of implementing media asset management systems
  - copyright and permissions
  - file and resource repository systems
  - industry or enterprise standard naming conventions
- OHS requirements as they relate to working on computers for periods of time

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • proficient use of information tracking and repository systems • accurate record keeping, updating and tracking • attention to detail • ability to work effectively as a member of a production team.
Context of and specific resources for assessment	Assessment must ensure: • access to industry-standard technology and repository systems that permit file and resource management • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of at least two media asset management systems set up and managed by the candidate • written or verbal questioning to test knowledge of the processes followed to manage media assets and the respective roles and responsibilities of team members.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUFDIG301A Prepare video assets • CUFDIG303A Produce and prepare photo images • CUFSOU301A Prepare audio assets.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• artists • author • designers • media asset creators • producer • programmer • project manager • supervisor • other specialist creative and administrative staff.

Projects may include or be included in:	• aspects or sections of film/video production:
	  • feature
	  • documentary
	  • short film and/or video
	  • animations
	  • commercials
	  • live or pre-recorded performances
	  • music video
	  • television production, e.g. music, drama, comedy, variety, sport
	  • live or pre-recorded television productions
	• e-commence
	• educational product
	• game
	• information product
	• promotional product
	• training product
	• website.

Information about assets may include:	• asset details • copyright • date of transfer • default technical settings

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RANGE STATEMENT	
	• reusability • transfer details • versions • other metadata as required.
Formal documents may include:	• agreed terms and conditions • assets rights clearances • confidentiality agreements • contracts with subcontractors • copyright permissions • final proposal • intermediate and final sign-offs • software licences • technical information.
Media assets may include:	• 3D models • animations (2D, 3D) • audio • code and scripts • graphics • photographs • text documents (PDF, MSWord, PowerPoint) • videos • other assets as required by the project.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Media and entertainment production - post-production

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Co-requisite units

Co-requisite units		

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CUFPPM404A Create storyboards

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to create storyboards. The creation of storyboards is a critical skill in the design and development of a broad range of digital content, including video, film, animation and interactive media. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Application of the unit	Depending on the type and scale of production, a range of people could be responsible for creating storyboards, including storyboard artists, designers, producers and information architects. In the film and television industry, people creating storyboards work closely with directors to visualise productions.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Plan storyboards	1. In consultation with ***relevant personnel***, clarify storyboard requirements for ***productions*** with reference to scripts and stories 2. Identify ***factors*** that affect type of storyboard to be created 3. Contribute ideas in pre-production meetings to help refine storyboard requirements 4. Research and select suitable amount of ***storyboard tools*** for a given purpose 5. Obtain sign-off from relevant personnel on the type of storyboard to be created
Draft storyboards	6. Break down content, scripts and stories into ***frames*** 7. Specify ***storyboard elements*** for each frame 8. Specify the logical linear or non-linear frame sequence, showing the connection between each frame 9. Provide ***descriptions*** for each frame 10. Seek feedback on work in progress from relevant personnel and incorporate ideas and feedback as appropriate 11. Ensure draft storyboards are clear and legible and show sufficient detail for production teams to use
Finalise storyboards	12. Present draft storyboards to relevant personnel for discussion and feedback 13. Refine storyboards as required to incorporate feedback 14. Ensure that final storyboards present accurate visual interpretations of scripts, stories or text and meet all agreed specifications 15. Make back-up copies of storyboards as required according to organisational procedures 16. Submit storyboards to relevant personnel by agreed deadlines 17. Review the process of creating storyboards and note areas for improvement

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication, teamwork and literacy skills sufficient to:
  - interpret and clarify written or verbal instructions
  - interpret scripts and specifications
  - work collaboratively in a team environment
  - present storyboards to team members for discussion or implementation
  - respond constructively to feedback received from other team members
- analytical skills sufficient to break down content, stories and scripts into discrete elements
- technical skills sufficient to use storyboard techniques
- initiative sufficient to visualise and interpret creative concepts
- self-management and planning skills sufficient to:
  - prioritise work tasks
  - meet deadlines
  - seek expert assistance when problems arise

Required knowledge

- industry knowledge, including:
  - roles and responsibilities of project team members
  - sound understanding of the artistic elements of a production for which a storyboard is being created
  - issues and challenges that arise when creating storyboards
- drawing techniques, including drawing to scale
- OHS standards as they relate to working for periods of time on computers

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Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • creation of clear and logical storyboards that meet specified requirements • ability to visualise creative concepts • ability to work effectively as a member of a production team.
Context of and specific resources for assessment	Assessment must ensure: • access to scripts, stories or texts that can be used as the basis for creating storyboards • access to current industry-standard software as listed in the range statement • access to appropriate learning and assessment support when required • use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance • evaluation of at least two storyboards created by the candidate • observation of a candidate presenting his/her storyboard to team members and explaining how it meets agreed requirements • written or oral questioning to test knowledge of the process followed to create a storyboard and the respective roles and responsibilities of team members.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

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EVIDENCE GUIDE	
	• BSBCRT402A Collaborate in a creative process • CUFDIG402A Design user interfaces • CUFDIG502A Design web environments • CUFDIG503A Design e-learning resources • CUFDIG504A Design games • CUFDIG505A Design information architecture • CUFDIG506A Design interaction • CUFDIG507A Design digital simulations.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• asset creators • authors • clients • content experts • directors • graphic designers • information architects • navigation designers • other writers • producers • programmers • scriptwriters • user interface designers • other technical/specialist staff.

Productions may include:	• animated films
	• animations
	• commercials
	• feature films
	• interactive media products, such as:
	  • e-learning products
	  • websites
	  • games
	  • promotional products
	  • information products
	• music videos
	• short films
	• television productions.

Factors may include:	• animation requirements • availability of personnel • availability of resources • budget • delivery platform, including:

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RANGE STATEMENT	
	• internet • CD/DVD • video • film • games console • kiosk • mobile telephone • personal digital assistant (PDA) • print media • graphic requirements • length of script or story • style of production, including: • comic • drama • educational • light entertainment • target audience • timelines.
Storyboard tools may include:	• digital software, such as: • PowerPoint • Inspiration • StoryBoard Artist Studio • StoryBoard Pro • paper and cards • pen and pencil • storyboard sheets • templates.
Frames may include:	• key frames for animation • moments for film and video • pages for websites • scenes • screens for interactive media • shots.
Storyboard elements may include:	• actor's movement • backgrounds • camera angles • camera shots, such as: • extreme close-up

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RANGE STATEMENT	
	• close-up • medium shot • long shot • extreme long shot • decisions • directions • frame composition • lighting • props • sets.
Descriptions for frames may include:	• dialogue • duration • media • narration • script elements • sequence number • shot composition, such as: • static • zoom • tilt • pan • dolly • track • sound effects • speech bubbles • text content • transitions, such as: • simple cut • black • fade in and fade out.

Unit Sector(s)

Unit sector	

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Competency field

Competency field	Media and entertainment production - production planning and management

Co-requisite units

Co-requisite units		

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ICPDMT321 Capture a digital image

Modification History

Release	Comments
Release 1	This version first released with ICP Printing and Graphic Arts Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to evaluate and use digital camera technology and alter and upload digital images.

It applies to individuals who may work in a team environment with some responsibility for producing quality outcomes based on requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Assess digital camera qualities	1.1 Camera software compatibility with hardware system is assessed and appropriate software is selected for job 1.2 Pixel resolution of camera is matched to required quality and resolution of outcome 1.3 RAM capacity of camera is checked to be sufficient for number of images required to be captured 1.4 Shutter speed, focal lengths and camera feature modes are assessed as suitable for quality and use of photographic images required 1.5 Lithium batteries are handled and stored according to work health and safety (WHS) requirements
2 Set up for image capture	2.1 Camera is set up for image composition according to job specifications 2.2 Lighting is arranged according to job specifications 2.3 Light intensity is set for correct exposure
3 Preview image	3.1 Tone curves are adjusted according to job specifications 3.2 Neutral balance of image is arranged and adjusted 3.3 Adjustments to image composition and exposure are made
4 Photograph and upload digital image	4.1 Digital camera is loaded and operated according to manufacturer's and job specifications appropriate to quality of image to be photographed 4.2 File is uploaded on to relevant computer and image saved on hard disk 4.3 Photographic image files are created and stored on computer 4.4 Photographic images are enhanced, cropped and altered electronically to deliver required image 4.5 Photographic images are checked to ensure they meet job brief 4.6 Photographic images are delivered using required delivery mode

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.5, 2.1, 2.2, 3.1, 4.1, 4.5	• Interprets textual information to determine and confirm job requirements
Writing	4.3	• Uses required conventions to name electronic files
Numeracy	1.2-1.4, 2.3	• Recognises mathematical data related to memory capacity • Uses basic mathematical calculations to select appropriate camera features related to shutter speed, focal length or pixel resolutions
Navigate the world of work	1.5	• Adheres to legislative requirements related to own role with specific reference to safety
Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.3, 4.1-4.6	• Plans and implements tasks required to complete jobs according to specifications • Assesses job requirements to make decisions related to camera settings and image outputs • Analyses image quality problems and identifies and implements appropriate correction methods • Understands the purposes, specific functions and key features of common digital systems and tools and operates them effectively to produce digital images

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICPDMT321 Capture a digital image	ICPMM321C Capture a digital image	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICPDMT321 Capture a digital image

Modification History

Release	Comments
Release 1	This version first released with ICP Printing and Graphic Arts Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- find and use information relevant to the task from various sources
- set up a digital camera correctly and safely
- use a digital camera to:
  - preview and capture THREE digital images
  - transfer images to a computer
  - use relevant software to produce final images that meet job requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and explain the key features of the digital camera that impact on the quality of the photographic image
- determine the safety requirements for handling and storing lithium batteries
- explain how to transfer and store images from a camera to a computer list and describe ways that photographic images can be altered or enhanced electronically
- explain why the required delivery mode is important when preparing a photographic image.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media technologies field of work and include access to:

- a digital camera
- computer hardware and software
- photographic equipment and materials.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICPDMT346 Incorporate video into multimedia presentations

Modification History

Release	Comments
Release 1	This version first released with ICP Printing and Graphic Arts Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to edit and add video to multimedia presentations.

It applies to individuals who select and use appropriate software and hardware to produce digital video sequences to meet required outcomes.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Digital media technologies

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Identify and describe formats of digital video	1.1 Distinguishing features and uses of range of digital video software are determined 1.2 Current video software appropriate to range of given outcomes is selected 1.3 Limiting factors of computer hardware on video production for specified job are determined 1.4 Differences of image quality and image size required to deliver desired outcome are determined 1.5 Data input, processing and output relevant to video are explained 1.6 Formats employed to create given computer video sequence for specified outcome are analysed
2 Design digital video	2.1 Appropriate digital video software for job is assessed and selected 2.2 Digital video editing software is used to combine video assets 2.3 Variations in video frame rates are controlled as required for job to be undertaken 2.4 Time stamping techniques are applied to video frames as required 2.5 Digital video is saved using appropriate file techniques
3 Edit digital video	3.1 Single and multiple video tracks are edited to achieve defined outcome 3.2 Multiple tracks of digital video are joined according to job specifications 3.3 Digital effects are employed to modify and integrate digital video tracks according to job specifications 3.4 Time encoding is applied to single and multiple edited digital video tracks according to job specifications 3.5 Video track is inserted into multimedia production sequence according to job specifications
4 Present digital video sequence	4.1 Digital video is tested and combined with other digital imaging, sound and/or animation to create multimedia sequence 4.2 Multimedia sequence including video is saved and presented to

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ELEMENT	PERFORMANCE CRITERIA
	client

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 2.3, 2.4, 3.3-3.5	• Interprets textual information to establish or confirm job requirements
Oral Communication	1.5	• Uses clear technical terminology to provide information about video to others
Numeracy	1.4, 2.3, 2.4, 3.4	• Uses simple mathematical calculations to verify image quality and image size and to measure frame frequencies and track lengths
Interact with others	4.2	• Selects and uses appropriate communication methods and protocols when presenting information to clients
Get the work done	1.1-1.4, 1.6, 2.1-2.5, 3.1-3.5, 4.1, 4.2	• Plans and implements tasks required to complete jobs according to specifications • Determines requirements and makes routine decisions directly related to completion of tasks • Understands the purposes, functions and features of digital systems and tools used for video recording and editing, and uses them effectively to complete tasks

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICPDMT346 Incorporate video into multimedia presentations	ICPMM346C Incorporate video into multimedia presentations	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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Assessment Requirements for ICPDMT346 Incorporate video into multimedia presentations

Modification History

Release	Comments
Release 1	This version first released with ICP Printing and Graphic Arts Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- design, compile, edit and present at least TWO multimedia sequences incorporating video including:
  - interpreting requirements from job specifications
  - selecting and using suitable software and hardware.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline important considerations when combining digital video with other digital imaging, sound and/or animation to create a multimedia sequence
- summarise the features of current video software programs, including the differences between the programs
- explain the limiting factors of video production on computers
- determine how the differences of image quality and image size are obtained
- describe the process used to combine video assets
- explain how variations in video frame rates are controlled
- explain why time stamping techniques are applied to video frames.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the digital media technologies field of work and include access to software, hardware and equipment and materials required for construction and editing of video files.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTBWN3082B Perform tests on optical communication system and components

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to test optical communication systems and components in the field using portable test instruments.

It covers testing of point-to-point networks as well as next generation optical fibre networks which use passive optical network (PON) technologies in fibre to the home (FTTH) deployment.

Application of the Unit

Installation contractors, technical staff and field officers from telecommunications service providers or other private and public organisations or regulatory authorities apply the skills and knowledge in this unit.

They combine technical skills with organisational and administrative skills to perform tests on broadband passive optical networks (PON), fibre to the x (FTTx) networks, hybrid fibre coaxial (HFC) networks and dense wavelength division multiplexing (DWDM) systems during installation, maintenance, commissioning and troubleshooting phases.

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Licensing/Regulatory Information

Licensing, legislative, regulatory and certification requirements apply to working at heights. If an elevated work platform (EWP) is required, verify state or territory law requirements for a licence to operate an EWP. Users should confirm requirements with the relevant federal, state or territory authority.

If working at heights, achievement of the unit 'CPCPCM2015A Work safely on roofs' from the CPC08 Construction and Plumbing Services Integrated framework training Package fulfils this requirement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Prepare to use optical measuring instruments	1.1 Obtain ***relevant legislation, codes, regulations and standards*** and prepare for the given work 1.2 Notify ***customer*** for site access, security arrangements and location details of ***optical system*** and test purpose 1.3 Identify site ***hazards*** and notify appropriate personnel to make site safe 1.4 Devise and implement risk control measures of hazards with handling optical fibres and lasers in consultation with appropriate personnel 1.5 Prepare a ***testing plan*** indicating the ***type of measurement*** at the nominated ***wavelength*** and seek approval from customer 1.6 Select the appropriate ***tools*** and ***test instruments*** according to the required measurement and enterprise practice
2. Conduct optical measurements	2.1 Set up test instrument according to manufacturer's instructions according to occupational health and safety ***(OHS) and environmental requirements*** 2.2 Perform measurement using knowledge of appropriate testing techniques and in a safe manner to assess the performance of optical system and component 2.3 Record test results and compare with standard test specifications from manufacturer and enterprise guidelines 2.4 Evaluate the test results and report on the functionality of the optical component or equipment and the performance of the optical system
3. Document measurement results	3.1 Document test results for future reference and make recommendations on optimising component and system performance 3.2 Clean work site and make safe according to the enterprise requirements and to customer satisfaction 3.3 Notify appropriate personnel of job completion for sign off and present test documentations

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customers and enterprise staff
- literacy skills to read and interpret work instructions and document work
- numeracy skills to gather and record data from measurements
- planning and organisational skills to plan, prioritise and manage own work
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - clean an optical connector to an acceptable industry standard
  - safely inspect an optical connector for contamination and determine if cleaning is necessary
  - safely operate:
    - optical loss test set (OLTS)
    - optical time domain reflectometer (OTDR)
    - PON power meter.
    -

Required knowledge

- consequences of mating contaminated optical connectors
- downstream and upstream signals
- DWDM metro and long haul system architecture
- HFC architecture (optical section)
- logarithmic power levels (decibels, dBm)
- optical connector types
- optical fibre safety, practices, handling and theory
- optical spectrum limits, wavelengths used in various applications and International Telecommunications Union (ITU) grid
- optical transmitters and receivers
- PON architecture
- safe handling procedures with optical fibres
- transmission system line rates:
  - optical Ethernet
  - synchronous digital hierarchy (SDH)
- wavelength division multiplexing (WDM), coarse wavelength division multiplexing (CWDM) and DWDM principles and optical multiplexers.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • measure optical power level • measure insertion loss of a passive device • measure end-to-end fibre loss (bi-directional) • measure splice loss • measure distance to fault, event, end of fibre using OTDR • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • sites on which optical measurements can be conducted • tools and equipment required for measurements • manufacturer's documentation for test instruments and equipment under test.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing optical measurements • review of a written reports and test results completed by the candidate • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation • ICTBWN3205B Use optical and radio frequency measuring instruments.

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	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant legislation, codes, regulations and standards may include:	• appropriate licences:
	  • crane
	  • EWP
	  • forklift
	  • winch
	• Australian Construction Industry Forum (ACIF) standards and codes
	• AS Communications Cabling Manual (CCM) Volume 1
	• AS/NZS 3000:2007
	• AS/NZS 3080:2003
	• AS/NZS 3084:2003
	• AS/NZS 3085.1:2004
	• AS/NZS IEC 61935.1:2006
	• AS/NZS IEC 61935.2:2006
	• AS/NZS ISO/IEC 14763.3:2007
	• AS/NZS ISO/IEC 15018:2005
	• AS/NZS ISO/IEC 24702:2007
	• cabling security codes and regulations
	• Environmental Protection Acts
	• OHS
	• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

Customer may be:	• asset manager • installation manager • maintenance manager • nominated customer representative • outage manager • project manager.
Optical system may contain:	• add-drop multiplexer • DWDM system • fibre hub • HFC network • optical line termination (OLT) • optical network termination (ONT)

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	• optical amplifier • optical splitter.
Hazards may include:	• building debris • earth potential rise • glass fibre • live power lines • manual handling • mud and water • natural gas and other gas build up • optical fibre cable may contain hazardous light • radio frequency (RF) equipment emitting radiation • remote power feeding services which operate at above telecommunications network voltage • vermin.
Testing plan may include:	• correct test set-up • recording and evaluation of measurements • test layout • test procedures • test purpose • test sites and location • type of measurements • use of appropriate test equipment.

Type of measurement may include:	• end-to-end continuity using visual fault locator
	• fibre loss (bi-directional)
	• insertion loss:
	  • coupler
	  • filter
	  • optical splitter
	  • WDM
	• optical power level at:
	  • drop terminal
	  • OLT
	  • ONT
	  • optical transmitter
	  • patch panel
	• optical return loss (ORL)
	• splice loss
	• total end-to-end loss, including splices and connectors.

Wavelengths may include:	• 850 nm • 1310 nm • 1490 nm

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	• 1550 nm.

Tools may include:	• alcohol swabs
	• dry type cleaning cassette for optical connectors
	• hand tools
	• lint-free dry wipes
	• microscope for examining optical connector with:
	  • integral safety infra-red filter
	  • video microscope display
	• optical connector adaptors
	  • FC to LC
	  • FC to SC
	  • FC to ST
	  • SC to ST
	• optical reference cable
	• optical termination.

Test instruments may include:	• bi-directional automated optical loss test set • hand-held optical power meter • hand-held optical source • launch cable for OTDR • OFI-FTTx active ONT detector • OLTS • ORL test set • OTDR multimode • OTDR single mode • PON – OTDR • PON meter • visual fault locator (VFL).

OHS and environmental requirements may include:	• decommissioning and isolating worksite and lines prior to commencement
	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves
	  • head protection
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses
	• safe working practices, such as the safe use and handling of:
	  • chemicals

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	• materials • tools and equipment • work platforms • safety equipment: • flashing lights • safety barriers • warning signs and tapes • witches hats • special access requirements • environmental considerations: • clean-up protection • stormwater protection • waste management.

Unit Sector(s)

Telecommunications - Broadband and wireless networks

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ICTBWN3088B Install optical fibre splitters in fibre distribution hubs

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Minor editorial change to performance criterion. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to install optical fibre splitters in fibre distribution hubs (FDH) as part of a fibre to the premises (FTTP) network.

Optical networks and FTTP are part of the strategies by service providers using wave division multiplexing (WDM) to deliver very high speed broadband capacity through the access network for the National Broadband Network (NBN) initiative.

Assessment by a TITAB-registered assessor is recommended.

Application of the Unit

Technicians and cable installers who install and maintain optical network cables and equipment in access networks apply the skills and knowledge in this unit to provide services in Next Generation Networks (NGN) using emerging technologies.

NGN services include internet protocol TV (IPTV), video on demand (VoD), interactive TV, mesh networks and cloud computing.

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Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Set up and prepare for installation	1.1 Review preparation to ensure work complies with requirements of ***relevant legislation, codes, regulations and standards*** 1.2 Scope the work by obtaining project plan from ***appropriate personnel*** and arrange for site access to comply with security arrangements 1.3 Notify appropriate personnel of identified ***safety hazards*** at the work site 1.4 Determine type of ***FDH enclosure*** and ***optical splitter module*** from project plan and identify splitter installation requirements using work instructions 1.5 Obtain ***tools and safety equipment*** and material to perform tasks safely and efficiently 1.6 Select and use required protective equipment and make site safe and secure for installation work 1.7 Obtain splitter module and visually inspect for ***splitter module damage*** and replace if necessary
2. Install splitter module in FDH	2.1 Follow occupational health and safety ***(OHS) and environmental requirements*** for the given work and identify and avoid ***other services*** 2.2 Open the enclosure and assess the suitability of the FDH according to the project plan 2.3 Locate next available slot in splitter module area of FDH for installation 2.4 Insert splitter module and secure according to manufacturer specifications 2.5 Inspect installed splitter module and surrounding area for completeness of job
3. Prepare and connect splitter input fibres to feeder cable	3.1 Locate feeder port to be connected and remove protective cover in preparation 3.2 Use an optical power meter to verify feeder port is not active 3.3 Clean the adapter according to manufacturer specifications and route splitter input fibre to correct feeder port 3.4 Remove dust cap and clean end face according to manufacturer specifications to prevent possible damage from mating ***contaminated connectors*** 3.5 Connect input fibre to feeder port and record connection

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	according to organisational policy
4. Connect output fibres and test splitter	4.1 Determine output fibre to be connected and required adapter in distribution field 4.2 Clean adapter and fibre end-face according to manufacturer specifications 4.3 Route output fibre and connect with adapter in distribution field 4.4 Test operation of optical splitter for optical power levels at the operating ***WDM optical wavelengths*** 4.5 Record connections, test results and park unused fibre leads for safety reasons according to organisational policy
5. Clean up work site	5.1 Seal any internal enclosures and close FDH 5.2 Remove installation waste and debris from work site and dispose of according to environmental requirements 5.3 Notify appropriate personnel of job completion and obtain sign-off

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to work effectively within a group
- literacy skills to interpret work instructions
- numeracy skills to gather and record data from measurements
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - clean optical end face
  - connect optical fibre to feeder port
  - operate WDM test equipment and optical power meter
  - recognise optical devices in a communication system
  -

Required knowledge

- organisational policy and procedures
- personal safety issues
- propagation of light in optical communication systems
- role of transmitters and receivers in optical communication systems
- site engineering
- specific OHS requirements relating to the handling of optical fibre and the use of laser light sources
- WDM applications
- workplace and industry environment.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • use optical power test equipment • measure optical signals at three WDM wavelengths • install splitter in the enclosure • connect input and out optical fibres to the splitter • test optical splitter • complete connection recording • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • a telecommunications operations site where installation of optical fibre splitters in FDH may be conducted • a fibre distribution hub and relevant optical splitter • use of tools, equipment and personal protective equipment currently used in industry • relevant regulatory and equipment documentation that impacts on work activities.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of candidate installing optical fibre splitters in FDH • direct observation of candidate applying all related OHS requirements and work practices • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, e.g. • ICTBWN3090B Install lead-in module and cable for fibre

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	to the premises • ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • Environment Protection Acts • ISO Draft 11801 (International) • OHS Acts and relevant codes and standards • regulated or industry codes of practice, including appropriate Australian Communications and Media Authority (ACMA) standards • relevant Institute of Electrical and Electronics Engineers (IEEE) standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Appropriate personnel may be:	• consultant • project engineer • project supervisor • site supervisor.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light (non-visible laser)
	  • radio frequency (RF) emission
	• active lasers with no safety labels
	• active optical fibres
	• contact with remote power feed
	• electrical supply that require mandatory separation from

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	communications cable
	• exposed fibres
	• unsafe support structures
	• unsafe weather:
	  • heavy rains
	  • high winds
	  • severe heat or cold
	  • thunderstorms.

FDH enclosure may include:	• external cabinet • internal cabinet.
Optical splitter module may include:	• 4 port • 8 port • 16 port • 32 port.

Tools and safety equipment may include:	• personal protective equipment
	• safety equipment
	• test equipment:
	  • passive optical network (PON) meter
	  • optical time domain reflectometer (OTDR)
	• tools:
	  • fibre cleaning kit
	  • fibre splicer
	  • labeller
	  • screw drivers
	  • spanners
	  • tagging tool.

Splitter module damage may include:	• broken connector • kinks in fibre leads • no end caps on connectors • physical damage to module body.

OHS and environmental requirements may relate to:	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber
	  • head protection
	  • masks

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	• protective suits • safety boots • safety glasses • safe work practices, such as the safe use and handling of: • chemicals • materials • tools and equipment • safety equipment: • flashing lights • safety barriers • warning signs and tapes • witches hats • special access requirements • environmental considerations: • clean-up protection • stormwater protection • waste management.
Other services may include:	• alarms • electrical services • fire sprinkler systems • gas and water mains • high voltage (HV) power • other service provider networks.
Contaminated connectors may include:	• chips • dry residue • dust • liquids • scratches.
WDM optical wavelengths are set at:	• 1310 nm • 1490 nm • 1550 nm.

Unit Sector(s)

Telecommunications - Broadband and wireless networks

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ICTBWN3090B Install lead-in module and cable for fibre to the premises

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to install a lead-in module and its associated cable for a fibre to the premises (FTTP) installation.

Optical networks and FTTP are part of the strategies by service providers using wave division multiplexing (WDM) to deliver very high speed broadband capacity through the Access Network for the National Broadband Network (NBN) initiative.

FTTP services can be underground or aerial and may include hybrid fibre coaxial (HFC) installations.

Assessment by a TITAB registered assessor is recommended.

Application of the Unit

Technicians and cable installers who install and maintain optical network cables and equipment in Access Networks apply the skills and knowledge in this unit to provide services in Next Generation Networks (NGN) using emerging technologies.

NGN services include internet protocol TV (IPTV), video on demand (VoD), interactive TV, mesh networks and cloud computing.

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Licensing/Regulatory Information

Licensing, legislative, regulatory and certification requirements apply to working at heights. If an elevated work platform (EWP) is required, verify state or territory law requirements for a licence to operate an EWP. Users should confirm requirements with the relevant federal, state or territory authority.

If working at heights, achievement of the unit 'CPCPCM2015A Work safely on roofs' from the CPC08 Construction and Plumbing Services Integrated framework training Package fulfils this requirement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Set up and prepare for installation	1.1 Obtain ***relevant legislation, codes, regulations and standards*** for compliance when conducting work 1.2 Scope the work by obtaining project plan from ***appropriate personnel*** and arrange for site access to comply with security arrangements 1.3 Notify appropriate personnel of identified ***safety hazards*** at the work site 1.4 Determine type of ***lead-in module*** and cable from project plan and identify ***installation requirements*** using work instructions 1.5 Obtain ***tools and safety equipment*** and material to perform tasks safely and efficiently 1.6 Select and use required protective equipment and make site safe and secure for installation work 1.7 Obtain lead-in module and visually inspect for ***lead-in module damage*** and replace if necessary
2. Install lead-in module in enclosure	2.1 Follow occupational health and safety ***(OHS) and environmental requirements*** for the given work and identify and avoid ***other services*** 2.2 Identify position in ***enclosure*** to secure module and install mounting bracket according to manufacturer's specifications 2.3 Splice lead-in module tail to distribution joint 2.4 Attach lead-in module to mounting bracket and secure in position
3. Install optical fibre lead-in cable to premises	3.1 Unpack and prepare lead-in cable according to manufacturer's specifications 3.2 Haul optical fibre lead-in cable to premises observing ***maximum strain*** on cable for underground installation 3.3 Coil excess cable length within enclosure 3.4 Install aerial lead-in using catenary and bearer wire to meet relevant height and minimum sag requirements
4. Terminate the lead-in cable at the premises	4.1 Access the optical network terminating (ONT) unit to expose lead-in cable to retrieve fibre and connector 4.2 ***Clean ONT adapter and connector*** according to manufacturer's specifications 4.3 Mate fibre connector with ONT adapter ensuring free of ***contaminants***

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	4.4 Route fibre cable within ONT and secure in position 4.5 Test operation of lead-in at the ONT for optical power levels at the designated operating ***WDM optical wavelength*** 4.6 Record connections, test results and park unused fibre leads for safety reasons according to organisational policy
5. Clean up work site	5.1 Seal ONT and enclosure 5.2 Remove installation waste and debris from worksite and dispose of according to environmental requirements 5.3 Notify appropriate personnel of job completion and obtain sign off

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to work effectively within a group
- literacy skills to interpret work instructions
- numeracy skills to gather and record data from measurements
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - clean optical end face
  - connect optical fibre to feeder port
  - operate WDM test equipment and optical power meter
  - recognise optical devices in a communication system
  - splice optical fibre lead in tail to distribution joint.
  -

Required knowledge

- licence requirements for working at heights
- organisational policy and procedures
- personal safety issues
- propagation of light in optical communication systems
- role of transmitters and receivers in optical communication systems
- site engineering
- specific OHS requirements relating to the handling of optical fibre and the use of laser light sources
- WDM applications
- workplace and industry environment.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • use optical power test equipment • measure optical signals at three WDM wavelengths • install lead-in module in the enclosure for both an aerial and underground installation • demonstrate successful completion of the procedures • complete connection recording • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • access to a telecommunications operations site where installation of lead-in module and cable for FTTP may be conducted • a fibre lead-in module, distribution pit, premises conduit and relevant ONT • use of tools, equipment and personal protective equipment currently used in industry • relevant regulatory and equipment documentation that impacts on work activities.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing lead-in module and cable for FTTP applying all related OHS requirements and work practices • direct observation of the candidate measuring optical signals at three WDM wavelengths • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:

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	• ICTBWN3088B Install optical fibre splitters in fibre distribution hubs • ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant legislation, codes, regulations and standards may include:	• appropriate licences:
	  • winch
	  • crane
	  • forklift
	  • EWP
	• Australian Communications Industry Forum (ACIF) standards and codes
	• AS Communications Cabling Manual (CCM) Volume 1
	• AS/NZS 3000:2007
	• AS/NZS 3080:2003
	• AS/NZS 3084:2003
	• AS/NZS 3085.1:2004
	• AS/NZS IEC 61935.1:2006
	• AS/NZS IEC 61935.2:2006
	• AS/NZS ISO/IEC 14763.3:2007
	• AS/NZS ISO/IEC 15018:2005
	• AS/NZS ISO/IEC 24702:2007
	• cabling security codes and regulations
	• Environmental Protection Acts
	• OHS
	• road and traffic control legislation and codes
	• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

Appropriate personnel may be:	• consultant • project engineer • project supervisor • site supervisor.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light (non-visible laser)
	  • radio frequency (RF) emission
	• active lasers with no safety labels
	• active optical fibres
	• contact with remote power feed
	• electrical supply that require mandatory separation from

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	communications cable
	• exposed fibres
	• unsafe support structures
	• unsafe weather:
	  • heavy rains
	  • high winds
	  • severe heat or cold
	  • thunderstorms.

Lead-in module may include:	• 1310 nm • 1490 nm • 1550 nm.
Installation requirements may refer to:	• aerial • underground • combination of underground and aerial.

Tools and safety equipment may include:	• personal protective equipment
	• safety equipment
	• test equipment:
	  • passive optical network (PON) meter
	  • optical time domain reflectometer (OTDR)
	  • local area network (LAN) Cat tester
	  • network analyser
	• tools:
	  • fibre cleaning kit
	  • fibre splicer
	  • labeller
	  • screw drivers
	  • spanners
	  • tagging tool.

Lead-in module damage may include:	• cuts in fibre sheathing • end caps on connectors • kinks in fibre leads • physical damage to module body.

OHS and environmental requirements may relate to:	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber

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	• head protection • masks • protective suits • safety boots • safety glasses • safe working practices, such as the safe use and handling of: • chemicals • materials • tools and equipment • safety equipment: • flashing lights • safety barriers • warning signs and tapes • witches hats • special access requirements • environmental considerations: • clean-up protection • stormwater protection • waste management.
Other services may include:	• alarms • electrical services • fire sprinkler systems • gas and water mains • high voltage (HV) power • other service provider networks.
Enclosure may include:	• cabinet • FTTP cabinet • HFC housing • housing • pit.
Maximum strain may relate to:	• typically 600 nm • verify with manufacturer's for specific value.
Clean ONT adapter and connector may use:	• dry clean • lint-free swabs • lint-free wipes • wet clean.
Contaminants may include:	• chips • dry residue • dust • liquids

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	• scratches.
WDM Optical wavelength is one of:	• 1310 nm • 1490 nm • 1550 nm.

Unit Sector(s)

Telecommunications - Broadband and wireless networks

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ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to work safely on a live optical fibre installation to test and commission a wave division multiplexing (WDM) system or connect a splitter for fibre to the x (FTTx) deployment.

Optical networks and FTTx are part of the strategies by service providers using WDM to deliver very high speed broadband capacity through the access network for the National Broadband Network (NBN) initiative.

Application of the Unit

Technicians and cable installers who install and maintain optical network cables and equipment in Access Networks apply the skills and knowledge in this unit to provide services in Next Generation Networks (NGN) using emerging technologies.

NGN services include internet protocol TV (IPTV), video on demand (VoD), interactive TV, mesh networks and cloud computing.

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Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

ICTWHS2170B Follow work health and safety and environmental policy and procedures

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Set up and prepare for working with live fibre	1.1 Obtain ***relevant legislation, codes, regulations and standards*** for compliance when conducting work 1.2 Scope the work by obtaining project plan from ***appropriate personnel*** and arrange for site access to comply with security arrangements 1.3 Notify appropriate personnel of identified ***safety hazards*** at the worksite 1.4 Determine type of ***FTTx equipment, components of optical distribution network (ODN)*** and ***WDM components*** from project plan for testing and commissioning 1.5 Obtain ***tools and safety equipment*** and materials to perform tasks safely and efficiently 1.6 Select and use required protective equipment and make site safe and secure for commissioning work 1.7 Create a safe working environment by following ***safe work practices*** and identifying ***optical fibre hazards*** that could cause ***possible injuries*** when handling optical fibres and laser-based equipment
2. Connect a splitter input fibre to the feeder cable	2.1 Follow occupational health and safety ***(OHS) and environmental requirements*** for the given work and identify and avoid ***other services*** 2.2 Locate the feeder fibre port to be connected 2.3 Determine the state (live or not) of the fibre port to be connected and notify transmitter to ensure that power is turned off at the source if the fibre port is live 2.4 Connect up connectorised splitter input fibres as instructed by the manufacturer 2.5 Arrange for power to be turned back on to the newly connected feeder port
3. Perform live WDM commission testing of a ODN installation used in FTTx network	3.1 Locate the appropriate test points in the ODN from manufacturer's instructions for WDM testing 3.2 Test live wavelengths for the WDM tests following safety precautions 3.3 Test the optical signal strengths for the ***operating wavelengths*** incoming into the optical network termination (ONT) and determine if signal strengths are within the ***range of acceptable power levels*** 3.4 Test the losses between the WDM outputs and the individual LM for each wavelength and determine if within

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	maximum and minimum power losses 3.5 Conduct all ***acceptance tests*** as specified by manufacturer 3.6 Record and tabulate all tests results for commissioning requirements
4. Clean up work site	4.1 Seal and secure any enclosures and cabinets 4.2 Remove waste and debris from worksite and dispose of according to environmental requirements 4.3 Notify appropriate personnel of job completion and obtain sign off

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to work effectively within a group
- literacy skills to interpret work instructions
- numeracy skills to gather and record data from measurements
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - clean optical end face
  - connecting optical fibre to feeder port
  - operate WDM test equipment and optical power meter
  - recognise optical devices in a communication system.
  -

Required knowledge

- organisational policy and procedures
- personal safety issues
- propagation of light in optical communication systems
- role of transmitters and receivers in optical communication systems
- site engineering
- specific OHS requirements relating to the handling of optical fibre and the use of laser light sources
- WDM applications
- workplace and industry environment.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • use optical power test equipment • evaluate tests results • connect input and output optical fibres to the splitter • conduct live tests measuring optical signals at three WDM wavelengths on optical devices • conduct acceptance tests for commissioning • demonstrate successful completion of the procedures • complete connection recording • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • a telecommunications operations site where an FTTP installation may be tested and commissioned • access to a WDM system and relevant optical splitter • use of tools, equipment and personal protective equipment currently used in industry • relevant regulatory and equipment documentation that impacts on work activities.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate using optical power test equipment applying all related OHS requirements and work practices • direct observation of the candidate conducting live tests measuring optical signals at three WDM wavelengths • direct observation of the candidate conducting acceptance tests for commissioning • oral or written questioning to assess required knowledge.

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Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTBWN3082B Perform tests on optical communication system and components • ICTBWN3088B Install optical fibre splitters in fibre distribution hubs • ICTBWN3090B Install lead-in module and cable for fibre to the premises. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • Environmental Protection Acts • ISO Draft 11801 (International) • OHS • regulated or industry codes of practice including appropriate Australian Communications and Media Authority (ACMA) standards • relevant Institute of Electrical and Electronics Engineers (IEEE) standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Appropriate personnel may be:	• consultant • project engineer • project supervisor • site supervisor.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light (non-visible laser)
	  • radio frequency (RF) emission
	• active lasers with no safety labels
	• active optical fibres
	• contact with remote power feed
	• electrical supply that require mandatory separation from

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	communications cable
	• exposed fibres
	• unsafe support structures
	• unsafe weather:
	  • heavy rains
	  • high winds
	  • severe heat or cold
	  • thunderstorms.

FTTx equipment may include:	• add-drop multiplexer • Bragg grating device • lead-in fibre cable • optical amplifier • optical filter • optical splitter.
Components of the optical distribution network (ODN) may include:	• distribution fibre • distribution joint acting as and feeding LMs (DLM) • fibre access point (FAP) • fibre distribution hub (FDH) • FDH tail cable • lead-in joint with multiple lead-in ports (LM) • main fibre cable • multi-dwelling unit (MDU) • network termination device (NTD) • optical network termination (ONT) • passive optical network (PON) • power supply unit (PSU) • single dwelling unit (SDU).
WDM components may include:	• dispersion compensation module • optical add/drop multiplexer • optical amplifier • optical de-multiplexer • optical multiplexer • transponder • variable optical attenuator.

Tools and safety equipment may include:	• personal protective equipment
	• safety equipment
	• test equipment:
	  • PON meter
	  • optical time domain reflectometer (OTDR)
	• tools:
	  • fibre cleaning kit

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	• fibre splicer • labeller • screw drivers • spanners • tagging tool.
Safe work practices may relate to:	• applying relevant Australian standards of required health and safety precautions when working with visible and infra-red lasers • avoiding contact with chemicals, breathing in fumes and vapours, and digesting such materials • clearing fibre particles, hazardous solvents or chemicals from site at the completion of the work • ensuring all solvent residues are disposed of according to environmental policy when using a wet cleaning process • gently releasing stored energy in coiled fibre cable • installing dust caps on unplugged fibre connectors • knowing action and treatment of potential accidents • knowing the colour codes used to identify the various types of fibre and what sort of signals these cables would normally carry • labelling active equipment to warn other people of possible hazards • leaving caps at the end of unconnected fibres and unused laser outputs • never unplugging patch leads without first turning off the active equipment • not damaging or obscuring manufacturer warnings or instruction labels of the laser product during installation • not looking directly into the end of a fibre as it may be carrying laser light • not looking into transmitter ports as they may be of active • not using magnifiers in the presence of laser radiation • restraining cable ends to prevent damage to eyes or body • using only built-in or another form of safe light source when examining connectors with a microscope for contamination, chips or fractures • using protective eyewear designed specifically for laser work • using sharps container to dispose of fibre off-cuts.
Optical fibre hazards may relate to:	• cleaning alcohol, epoxy resins and other solvents and chemicals may be carcinogenic, cause allergies or be dangerous to health in other ways • cleaning fluids, solvents and other chemicals may be highly inflammable

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	• fibre off-cut damage to eyes and skin • inhalation of fibre off-cuts and particles from vacuum cleaning of worksite • laser damage to eyes • causing personal injury by activating equipment without notifying other staff who may be working remotely on the network.
Possible injuries may include:	• damage to lungs from inhalation of fibre off-cuts or particles • damage to retina in eyes • damage to skin from fibre off-cuts • personal injury from cable end whipping when releasing coiled cable.

OHS and environmental requirements may include:	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber
	  • head protection
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses
	• safe working practices, such as the safe use and handling of:
	  • chemicals
	  • materials
	  • tools and equipment
	• safety equipment:
	  • flashing lights
	  • safety barriers
	  • warning signs and tapes
	  • witches hats
	• special access requirements
	• environmental considerations:
	  • clean-up protection
	  • stormwater protection
	  • waste management.

Other services may	• alarms • electrical services

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include:	• fire sprinkler systems • gas and water mains • high voltage power • other service provider networks.
Operating wavelengths may include:	• 1310 nm • 1490 nm • 1550 nm.
Range of acceptable power levels may include:	• -2 to + 2 dBm @ 1310 nm • -26 to -6 dBm @ 1490 nm • -11.5 to +5 dBm @ 1550 nm.
Maximum and minimum power losses may include:	• 23.3 dB to 15.0 dB @1310 nm • 21.6 dB to 8.0 dB @1490 nm • 20.9 dB to 9.5 dB @1550 nm.
Acceptance tests may include:	• delay • dispersion • optical attenuation and loss measurements • optical power levels • phase.

Unit Sector(s)

Telecommunications - Broadband and wireless networks

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ICTCBL2065B Splice and terminate optical fibre cable for carriers and service providers

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Addition to application. Minor changes to knowledge requirements and range statement to reflect changed terminology. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to splice and terminate optical fibre cable within an optical telecommunications transmission environment.

This work is essential in provisioning of National Broadband Network (NBN) infrastructure for high speed and high bandwidth transmissions.

Assessment by a TITAB-registered assessor is recommended.

All customer cabling work in the telecommunications, fire, security and data industries must be performed by a registered cabler. All cablers are required to register with an Australian Communications and Media Authority (ACMA)-accredited registrar.

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Application of the Unit

Technical staff who splice and terminate optical fibre cable for telecommunications projects apply the skills and knowledge in this unit.

They may carry out new installations, upgrade an optical backbone or access network provisioning for greater bandwidth and capacity required by emerging technology convergence for Next Generation Networks (NGN).

This unit may be applied to commercial or industrial fibre to the premises (FTTP) installations.

This unit does not include consideration of mechanical splicing. For mechanical splicing, refer to ICTCBL3010B Install and terminate optical fibre cable on customer premises.

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Prepare for splicing	1.1 Select safety equipment to protect self and public according to enterprise guidelines and ***occupational health and safety (OHS) practices*** 1.2 Confirm layout of job using installation according to ***physical conditions*** at site and requirements of ***relevant legislation, codes, regulations and standards*** 1.3 Inform appropriate personnel of identified ***hazards*** on work site 1.4 Locate other services from ***relevant authorities*** according to enterprise guidelines and safe practices 1.5 Test for ***dangerous gases*** and place ***guards*** around open manholes following ***OHS and environmental requirements*** 1.6 Obtain approval for alterations to the design according to enterprise guidelines
2. Check existing optical fibre cable	2.1 Verify that cable was installed according to the installation plan and visually inspect ***cable*** for signs of sheath damage 2.2 Maintain minimum bend ratios according to manufacturer specifications to prevent cable damage and signal degradation 2.3 Secure cable according to safe industry practice to avoid cable and sheath damage
3. Splice optical fibre cable	3.1 Verify fibre is not live using ***appropriate equipment*** to maintain safe work practices, and ensure correct fibre has been identified 3.2 Prepare cable end to expose ***optical fibres*** according to splicing method and manufacturer specifications 3.3 Prepare and ***splice fibres*** using safe industry practice according to enterprise specifications 3.4 Test splice joint to manufacturer and design requirements
4. Terminate optical fibre cable	4.1 Select connector unit to suit terminating frame according to design specifications 4.2 Terminate the cable using ***type of termination*** specified in the plan and according to manufacturer specifications 4.3 Test termination for transmission loss and strength and re-terminate if transmission loss exceeds the manufacturer specifications 4.4 Install protection devices on connectors and fibres to protect from exposure and contaminants

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	4.5 Label and lay up cables in enclosure according to manufacturer's instructions and enterprise guidelines
5. Finish job and report	5.1 Remove waste and reinstate site according to enterprise guidelines 5.2 Prepare reports, including test results and alterations to plans, according to enterprise policy 5.3 Notify client of work completion and obtain sign-off

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
  - liaise with internal and external personnel on technical and operational matters
  - relate to work associates, supervisors, team members and clients
- literacy skills to interpret technical documentation, such as equipment manuals, specifications and requirements for optical fibre cable installation
- numeracy skills to take and analyse measurements
- planning and organising skills to organise and maintain equipment
- problem-solving skills to solve equipment and logistics problems
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - apply work site OHS
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work safely with optical fibre and lasers
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - install customer access network (CAN) cable
  - operate test equipment to perform measurements on optical fibre
  - perform fault clearance
  - use diagnostic equipment
  - use optical fibre jointing techniques
  - use specialised tools and test equipment
  - use hand and power tools
  -

Required knowledge

- causes of signal strength loss in optical fibre
- colour coding of fibres
- detailed knowledge of AS/NZS 2211:2006 Safety of laser products (parts 1 and 2)
- features and operating requirements of test equipment for optical fibre cable
- industry and organisational policy and procedures when splicing optical fibre cable
- information required to operate equipment according to a test specification
- manufacturer requirements for safe operation of optical fibre equipment
- safety precautions when working with laser-based systems
- specific OHS requirements relating to the activity and site conditions
- techniques for types of termination, including:
  - direct termination
  - fusion splicing

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- test methods and performance requirements
- types of optical cable and termination
- workplace and industry environment

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • splice, terminate and test optical fibre cable applying safety precautions when working with laser-based systems • splice at least 12 fibres and house them in splicing cassettes and trays within industry recognised enclosures according to manufacturer's instructions • install a mechanical connector and a fusion, spliced pigtail type connector • complete relevant documentation to manufacturer and design requirements • provide report documenting installation and test results to client • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • sites where splicing and termination of optical fibre cable may be conducted • use of optical fibre testing equipment currently used in industry • relevant regulatory and equipment documentation that impacts on optical fibre cable installation activities.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of a hands-on project completed by the candidate • review of an oral and written report, including installation and test results • direct observation of the candidate carrying out splicing of optical fibre within an optical communication system.
Guidance information	Holistic assessment with other units relevant to the industry

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for assessment	sector, workplace and job role is recommended, for example: • ICTCBL3010B Install and terminate optical fibre cable on customer premises. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

OHS practices may relate to:	• determining that optical fibre cable is not live according to guidelines and standards • handling optical fibre cable in a safe manner to avoid risk of injury • labelling fibre cable and laser devices • locating and identifying adjoining services according to enterprise guidelines and OHS practices • observing AS/NZS 2211:2006 Safety of laser products (parts 1 and 2) • testing for presence of dangerous gases according to enterprise guidelines.
Physical conditions may relate to:	• above ground • in cabinet • in joint enclosure.
Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 2211:2006 Safety of laser products (parts 1 and 2) • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • OHS Acts and relevant codes and standards • regulated or industry codes of practice, including ACMA technical standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Hazards may include:	• earth potential rise (EPR) • optical cable: • bare fibres

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	• hazardous laser light • remote power feeding.

Relevant authorities may include:	• cable location services (Dial Before You Dig)
	• environment protection
	• local government
	• private owners
	• utility providers, such as:
	  • electricity
	  • fire services
	  • gas
	  • water
	  • other telecommunications providers.

Dangerous gases may include:	• asphyxiating gas • carbon dioxide • carbon monoxide • combustible • natural gas • noxious gas.
Guards may include:	• barricades • plates • temporary fencing.

OHS and environmental requirements may relate to:	• identifying other services, including power and gas
	• need to decommission and isolate work site and lines before beginning work
	• personal protective clothing:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber
	  • head protection
	  • kneepads
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses
	• safe work practices, such as the safe use and handling of:
	  • asbestos
	  • chemicals
	  • materials

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	• tools and equipment
	• work platforms
	• safety equipment:
	  • flashing lights
	  • gas and other hazard detection equipment
	  • safety barriers
	  • trench guards
	  • warning signs and tapes
	  • witches hats
	• suitable light and ventilation
	• special access requirements
	• environmental considerations:
	  • clean-up protection
	  • stormwater protection
	  • waste management.

Cable may include:	• air blown • armoured • external • internal • loose tube • tight buffered.
Appropriate equipment may include:	• hand-held optical power meter • OFI-fibre to the x (FTTx) active optical network terminal (ONT) detector • passive optical network (PON) meter • optical time domain reflectometer (OTDR).
Optical fibres may include:	• multi-mode • polymer • single mode.
Splice fibres may relate to:	• fusion splice • preparing connection ends to a smooth flat surface to ensure no optical path redirection from joint • removing all coatings from exposed optical fibre and removing all possible contaminants.
Type of termination may include:	• direct termination • fusion splicing.

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Unit Sector(s)

Telecommunications - Cabling

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ICTCBL2136B Install, maintain and modify customer premises communications cabling: ACMA Restricted Rule

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Addition to required knowledge. Minor changes to knowledge requirements and range statement to reflect changed terminology. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to safely install, maintain and modify the customer premises communications cabling required according to the Australian Communications and Media Authority's (ACMA) 'Restricted' Cabling Provider Rule.

Restricted cabling is used in typical domestic premises, small offices, home offices and small business premises. Restricted cablers can install cable in large commercial and industrial premises provided the cabling is behind a compliant device and is not via jumperable distributors or patch panels.

The Telecommunications Cabling Provider Rules (CPRs) 2000 place various limitations on Restricted cablers. These include a prohibition on them performing cabling work where they may have access to a reticulated electrical supply that exceeds typical domestic single-phase and three-phase electrical supply voltages – nominally 240 volts AC (for single phase) or 415 volts AC (for three-phase).

Assessment by a TITAB-registered assessor is recommended.

All customer cabling work in the telecommunications, fire, security and data industries must be performed by a registered cabler. All cablers are required to register with an ACMA-accredited registrar.

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Application of the Unit

This unit applies to customer cabling terminated on sockets and network termination devices (NTD). It applies to the installation, maintenance and modification of indoor and external cabling.

Customer cabling, for the purpose of the 'Restricted' Cabling Provider Rule, may be used to connect devices for a range of applications, including telecommunications, simple data and computer use, security alarm panels and fire control panels.

Cabling may be metallic or optical fibre and may be aerial or underground.

The cabling task may be a new cable installation or upgrade of cable capacity for an existing network or subsystem for convergence to Next Generation Networks (NGN) applications.

The cabling installer may provide services in telephony, voice over internet protocol (VoIP), internet protocol TV (IPTV) and computer data over a single metallic customer cable or optical fibre cable in a specific customer location.

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Work within the constraints imposed by customer premises and ACMA regulatory environment	1.1 Prepare for ***restricted cabling work*** within the ***regulatory and cabling environment, cable type, cable identification, termination systems, earthing and protection, records*** and according to requirements of ***relevant legislation, codes, regulations and standards*** 1.2 Identify ***building infrastructure*** that places critical constraints on ***cabling*** 1.3 Develop ***strategies to manage other infrastructure*** in relation to cabling 1.4 Notify appropriate personnel of ***safety hazards*** at the cabling work site
2. Manage remote power feed	2.1 Identify and avoid the risks posed by contact with remote power feeding services when performing cabling activity 2.2 Make site safe by identifying remote power feeding services that operate at above telecommunications network voltage (TNV) inside customer premises
3. Install cables and protective earth wires	3.1 Install cables according to manufacturer's application specifications, including tension and bending stress requirements 3.2 Identify and avoid sources of possible damage to cable, including hot pipes, sharp edges and cable burn 3.3 Allow sufficient excess at cable ends to facilitate ***termination*** 3.4 Place and secure cable to maintain safety and interference segregation according to legislative and industry standards 3.5 Install cable ties with correct tension to prevent cable sheath damage or transmission impairment and trimmed flush to prevent risk of personal damage 3.6 Install underground cables to minimum depth of cover and segregation from hazardous electrical and other services according to AS/CA TS009:2013 3.7 Install underground cables excluding blown fibre tube systems to incorporate a blocking agent within the cable to prevent the ingress of water 3.8 Install aerial cables to minimum clearance, segregation from hazardous electrical and other services and minimum height requirements according to AS/CA TS009:2013 3.9 Install over-voltage protection devices according to AS/CA TS009:2013 to all cable pairs, where required, to suppress

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	voltage surges and protect from earth potential rise (EPR) hazards and protectively earth the devices 3.10 Protect earth wire insulation against damage and segregate protective earths according to relevant legislative and industry standards
4. Terminate and test cables and earth wires	4.1 Remove cable sheath to allow for correct termination length and without damage to underlying conductors and their insulation 4.2 Install NTD terminating modules according to manufacturer specifications and with cable pairs neatly and sequentially fanned for termination 4.3 Terminate conductors according to recommended colour code sequence using appropriate termination tools in the manufacturer's specified manner 4.4 Earth cable shield, if applicable, to manufacturer specifications, relevant industry codes of practice and AS/CA TS009:2013 4.5 Conduct visual inspection to confirm termination colour code sequence has been followed prior to end-to-end testing of wire and pair termination integrity 4.6 Terminate earth wires with connectors recommended by manufacturers according to accepted industry codes of practice and AS/CA TS009:2013 4.7 Maintain earth wire continuity throughout and observe interface requirements with electrical systems 4.8 Test earthing installation for continuity, insulation resistance and conductive resistance according to accepted industry standards, including AS/CA TS009:2013 4.9 Confirm compatibility of alterations with existing systems and test new work both in isolation and when integrated with existing systems
5. Inspect cable route to ensure correct separations	5.1 Inspect ***separations*** along the entirety of the cable route and rectify separations that do not comply with regulations 5.2 Install barriers to achieve separations where sufficient spatial separation cannot be met
6. Create records	6.1 Provide the client with a job sign-off and telecommunications cabling advice form, at the completion of each cabling task 6.2 Complete NTD record cards for the work undertaken
7. Monitor work	7.1 Supervise cablers not holding appropriate registration for

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activity	the task to ensure cabling activity is according to legislative requirements for safety and network integrity, including AS/ACIF S008:2006 and AS/CA TS009:2013

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with work associates, supervisors, team members and clients
- literacy skills to interpret:
  - requirements of related legislation, codes regulations and standards
  - technical documentation, such as equipment manuals and specifications
- numeracy skills to take and analyse measurements
- planning and organising skills to organise and maintain equipment
- problem-solving skills to solve equipment and logistics problems
- safety awareness skills to:
  - check environmental conditions are suitable for termination
  - make site safe and secure for cable installation
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- task-management skills to:
  - apply work practices that avoid cable damage
  - conform to work specifications and relevant industry standards
- technical skills to:
  - check cable route for obstructions and make clear, using suitable methods
  - handle cable according to manufacturer specifications so that conductors, sheath and insulation are not damaged during installation
  - select cabling system to meet customer performance needs
  - read and interpret drawings related to:
    - cable coding system, identifiers and distributor locations
    - cable layouts
    - outlet location
  - terminate copper twisted pair, including indoor, external, aerial and underground cabling
  - use diagnostic equipment
  - use hand and power tools.
  -

Required knowledge

- basic electrical principles relating to insulation, resistance, capacitance and induction, as causes of impedance, attenuation and cross-talk
- ACMA cabling provider rules, cabler registration rules, regulations and standards
- features and operating requirements of recognised cabling specific industry test equipment
- information required to operate equipment according to a test specification
- manufacturer requirements for safe operation of equipment

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- requirements of legislation, codes of practice and other formal agreements that impact on the work activity
- specific occupational health and safety (OHS) requirements relating to the activity and site conditions
- test methods and performance requirements
- typical issues and challenges that occur on site.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	
	• complete a cabling installation and termination:
	  • three different types of telephone sockets:
	  • Australian modular socket
	  • Mode 3 alarm socket
	  • United States modular socket
	  • one NTD
	  • one alarm panel, including completion of a TCA compliance form and NTD records
	  • one Ethernet cable
	• apply cable conductor identification codes
	• conduct and interpret cable test results
	• interpret and apply standards and regulations
	• comply with all related OHS requirements and work practices.

Context of and specific resources for assessment	Assessment must ensure: • a site on which communications cabling activities may be carried out • use of cabling and field equipment currently used in industry • licensing requirements and other site-related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate undertaking cabling installations and tests, and applying cable conductor identification codes • oral or written questioning to assess knowledge of test results, standards requirements and specific technical procedures.
Guidance information	Holistic assessment with other units relevant to the industry

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for assessment	sector, workplace and job role is recommended, for example: • ICTCBL2137B Install, maintain and modify customer premises communications cabling: ACMA Open Rule. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Restricted cabling work refers to:	• aerial and underground cabling work on private property • cabling work that is performed only in relation to a customer's premises • customer cabling that terminates directly at the network boundary on a socket or network termination device.
Regulatory environment refers to:	• accredited registrars and registration • ACMA • Certified Components List • Communications Alliance • labelling requirements • Telecommunications Act 1997.

Cabling environment may refer to:	• indoor environments, including concealed locations:
	  • ceilings and false ceilings
	  • internal wall space
	  • modular workstations
	  • under floor
	• outdoor environments, including cable installations:
	  • aerial telecommunications cabling for restricted cabling work, which does not include installations on poles shared with low voltage (LV) or high voltage (HV) electrical power cables or terminations
	  • external walls
	  • underground cabling in an exclusive trench or shared trench with electrical LV cables and other utilities.

Cable type may include:	• aerial • coaxial • copper twisted pair • data cables: Category 5, 6, 6A, 7 or 7A • external • indoor • optic fibre cable • underground.
Cable identification	• cable conductor identification codes:

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refers to:	• banded • colour coded • lettered • numbered.

Termination systems must include:	• network termination device
	• socket types:
	  • Australian modular socket
	  • Mode 3 alarm socket
	  • United States modular socket.
	Note: Jumperable distributors are not included in this requirement.

Earthing and protection must include:	• earthing for protection • surge suppression.
Records may include:	• NTD record cards • telecommunication cabling advice forms TCA1 and TCA2.
Relevant legislation, codes, regulations and standards may include:	• accredited registrars and registration • Australian Communications Industry Forum (ACIF) standards and codes • ACMA • AS/NZS 3000:2007 • AS/ACIF S008:2006 and AS/CA TS009:2013 • Certified Components List (CCL) • AS Communications Cabling Manual (CCM) – Restricted • labelling • overview of Telecommunications Act 1997.
Building infrastructure may include:	• availability and suitability of existing cabling trays and fixing systems • building hazards • elevated working • high voltage (HV) power • restricted access.
Cabling may include:	• aerial customer • external customer • indoor customer • underground customer.
Strategies to manage other infrastructure may include:	• appropriate separations • correct use of cable trays and support systems • fastening techniques.
Safety hazards may	• access points that may contain:

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refer to:	• hazardous light or non-visible laser • radio frequency (RF) emission • electrical supply and areas of earth potential rise (EPR) that require mandatory separation from communications cable • hazardous conduit as according to AS 1345:1995 conduit colours associated with a hazardous service.
Termination may include:	• Australian modular socket • Ethernet connectors terminated at both ends of an Ethernet cable and tested • Mode 3 alarm socket • NTD • United States modular socket Note: Jumperable distributors are not included in this requirement.
Separations refer to:	• correct separations between communications cable and other services: • LV • HV single core • HV multi-core • open terminations • separations covered by AS/CA TS009:2013.

Unit Sector(s)

Telecommunications - Cabling

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ICTCBL2137B Install, maintain and modify customer premises communications cabling: ACMA Open Rule

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Minor additional to critical evidence. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

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Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to safely install, maintain and modify customer premises communications cabling required according to the Australian Communications and Media Authority's (ACMA) 'Open' Cabling Provider Rule.

This rule is associated with small installations connected to sockets and larger commercial and industrial installations involving many lines, multi-pair cables, backbone cabling, multi-story buildings and more complicated termination modules and distributors.

The cabling activity may be a new cable installation or an upgrade of cable capacity for an existing network or subsystem, or cabling infrastructure for convergence to Next Generation Networks (NGN).

Convergence in the telecommunications and IT areas is the emergence of a single infrastructure for a range of telephony and IT services. Telephone, voice over internet protocol (VoIP), internet protocol TV (IPTV) and computer data may all travel over a single metallic customer cable, optical fibre cable or wireless link in a specific location.

Assessment by a TITAB-registered assessor is recommended.

This unit meets the minimum ACMA prescribed level of knowledge and skill that safeguards matters of health, safety and network integrity, and addresses matters of interoperability where customer equipment and standard telephone service are involved only.

Note:

- Completion of this unit does not imply industry competency using specialised cabling, such as coaxial, optical fibre and structured cabling
- Completion of the following six cabling units: ICTCBL2005B, ICTCBL2006B, ICTCBL2008B, ICTCBL2012B, ICTCBL2017B and ICTCMP2022B exceed the requirements of this standard and fulfil the requirements for ACMA Cabling Provider Rules: Open Cabling Category for Cabler Registration
- To be permitted to work with lift cabling, cablers are required to have completed the relevant Electrotechnology qualification, such as the Certificate III in Electrotechnology Electrician or equivalent.

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Application of the Unit

This unit applies to customer cabling terminated on distributors. It applies to installation, maintenance and modification of indoor, external, underground cabling on private and public property.

Customer cabling, for the purpose of this standard, may be used to connect devices for a range of applications, including telecommunications, Ethernet, video and multimedia, security and alarms, and fire protection.

The cabling task may be a new cable installation or upgrade of cable capacity for an existing network or subsystem for convergence to NGN applications.

Cabling installers providing services in telephony, VoIP, IPTV and computer data over a single metallic customer cable or optical fibre cable in a specific customer location apply the skills and knowledge in this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

ICTCBL2136B Install, maintain and modify customer premises communications cabling: ACMA Restricted Rule

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Work within the constraints imposed by customer premises and ACMA regulatory environment	1.1 Prepare for ***open cabling work*** according to the ***regulatory and cabling environment, cable type, cable identification, termination systems, earthing and protection, records*** and according to requirements of ***relevant legislation, codes, regulations and standards*** 1.2 Identify ***building infrastructure*** that places critical constraints on ***cabling*** 1.3 Develop ***strategies to manage other infrastructure*** in relation to cabling 1.4 Notify appropriate personnel of identified ***safety hazards*** at cabling work site
2. Manage remote power feed	2.1 Identify and avoid the risks posed by contact with remote power feeding services when performing cabling activity 2.2 Make site safe, identifying remote power feeding services that operate at above telecommunications network voltage (TNV) inside customer premises
3. Install and modify cable support, earthing and termination infrastructure	3.1 Install fixings and ***cable support structures*** of adequate strength safely and aligned with the environment according to manufacturer and customer specifications 3.2 Secure catenary supports to building structure and tension, where necessary, to ensure cable weight can be carried in operating conditions with interference and safety segregation maintained, including adherence to AS/CA TS009:2013 3.3 Install protective earthing of metal work to industry standards where required 3.4 Inspect installed support structure to ensure cable will not be exposed to damage during installation and general operation 3.5 Position terminating equipment and fixing to accepted industry codes of practice, standards and customer requirements 3.6 Inspect back-mount and outlet layout for compliance to manufacturer specifications and allow adequate work space for ease of access and avoid overlaying 3.7 Segregate incoming and outgoing cables for ease of access and avoid overlaying
4. Install cables and earth wires	4.1 Install cables according to manufacturer's application specifications, including tension and bending stress requirements 4.2 Identify and avoid sources of possible damage to cable,

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	including hot pipes, sharp edges and cable burn 4.3 Allow sufficient excess at cable ends to facilitate ***termination*** 4.4 Label telecommunication outlet ends of cable uniquely to match identifier at originating location 4.5 Place and secure cable to maintain safety and interference segregation according to legislative and industry standards 4.6 Install cable ties with correct tension to prevent cable sheath damage or transmission impairment and trimmed flush to prevent risk of personal damage 4.7 Install aerial cables supported by catenaries in external environment to meet minimum above ground clearances and clearances from hazardous electrical services according to AS/CA TS009:2013 4.8 Install underground cables to minimum depth of cover and segregation from hazardous electrical and other services according to AS/CA TS009:2013 4.9 Install cables underground (excluding blown fibre tube systems) to incorporate a blocking agent within the cable to prevent the ingress of water 4.10 Install over-voltage protection devices to all cable pairs, where required, according to AS/CA TS009:2013, to suppress voltage surges with the devices protectively earthed 4.11 Conduct a visual inspection to verify telecommunications reference conductor (TRC)/ communications earthing system (CES)/ earth wire insulation is protected against damage and TRC/CES/protective earth is segregated according to relevant industry and legislative standards and AS/CA TS009:2013
5. Terminate and test cables and earth wires	5.1 Remove cable sheath to allow for correct termination length and without damage to underlying conductors and their insulation 5.2 Install terminating modules according to manufacturer specifications and with cable pairs neatly and sequentially fanned for termination 5.3 Terminate conductors according to recommended colour code sequence using appropriate termination tools in the manufacturer's specified manner 5.4 Earth cable shield, if applicable, to manufacturer specifications, relevant industry codes of practice and AS/CA TS009:2013 5.5 Conduct visual inspection to confirm termination colour

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	code sequence has been followed prior to end-to-end testing of wire and pair termination integrity 5.6 Terminate TRC/CES/earth wires with connectors recommended by manufacturers according to accepted industry codes of practice and AS/CA TS009:2013 5.7 Maintain TRC/CES/earth wire continuity throughout to meet interface requirements with electrical systems 5.8 Test TRC/CES/earthing installation for continuity, insulation resistance and conductive resistance according to accepted industry standards, including AS/CA TS009:2013 5.9 Confirm compatibility of alterations with existing systems and test new work both in isolation and when integrated with existing systems 5.10 Test cable according to performance specifications
6. Inspect cable route to ensure correct separations	6.1 Inspect ***separations*** along the entirety of the cable route and rectify separations that do not comply with regulations 6.2 Install barriers to achieve separations where sufficient spatial separation cannot be met
7. Evaluate earthing needs for cable systems on customer premises	7.1 Locate existing earthing systems in customer premises and analyse the earthing needs of cable systems in a range of building types 7.2 Calculate the upper and lower limits of resistance for a variety of cable system earths using relevant cable characteristics
8. Label earthing systems	8.1 Identify label requirements for all types of earthing systems 8.2 Attach label to earthing systems according to industry regulations
9. Create or update cable plans and records	9.1 Document ***installation details*** on record sheets and plans and store according to customer requirements 9.2 Label cable pairs clearly to provide an accurate identification according to manufacturer, industry and client standards 9.3 Record ***cabling details*** in cable pair record books to provide an accurate record according to industry codes of practice and AS/CA TS009:2013 9.4 Complete telecommunications cabling advice (TCA) form
10. Monitor work activity	10.1 Maintain close supervision of cablers not holding appropriate registration for the task to ensure installation and maintenance activity is strictly according to legislative

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	requirements and industry standards for safety and network integrity including AS/ACIF S008:2006 and AS/CA TS009:2013

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with team members, supervisors and customers on technical and operational matters
- interpersonal skills related to work associates, supervisors, team members and clients
- literacy skills to interpret:
  - requirements of relevant legislation, codes, regulations and standards
  - technical documentation, such as equipment manuals and specifications
- numeracy skills to take and analyse measurements
- planning and organising skills to organise and maintain equipment
- problem-solving skills to solve equipment and logistics problems
- safety awareness skills to:
  - check environmental conditions are suitable for installation
  - make site safe and secure for cable installation
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- task-management skills to:
  - apply work practices that avoid cable damage
  - conform to work specifications and relevant industry standards
- technical skills to:
  - check cable route for obstructions and make clear, using suitable methods
  - handle cable according to manufacturer specifications so that conductors, sheath and insulation are not damaged during installation
  - read and interpret drawings related to:
    - cable coding system, identifiers and distributor locations
    - cable layouts
    - outlet location
  - select cabling system to meet customer performance needs and conform to work specifications and relevant industry standards
  - terminate copper twisted pair, including indoor, external, aerial and underground cabling
  - use diagnostic equipment
  - use hand and power tools.
  -

Required knowledge

- ACMA cabling provider rules, cabler registration rules, regulations and standards
- features and operating requirements of recognised cabling specific industry test equipment
- information required to operate equipment according to a test specification
- manufacturer requirements for safe operation of equipment
- protection earthing

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- requirements of legislation, codes of practice and other formal agreements that impact on the work activity
- specific occupational health and safety (OHS) requirements relating to the activity and site conditions
- test methods and performance requirements
- typical issues and challenges that occur on site.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • terminate systems at both distributor and outlet locations • install and terminate one jumperable distributor (campus distributor or building distributor) with a capacity of 100 pair or greater • terminate one non-jumperable distributor (LD) and a patch panel • terminate at least one 50 pair, one 4 pair and one Ethernet cable, including accurate completion of installation records, drawing alterations and compliance forms • place cables on support structures and building faces for both internal and external locations • secure methods for the above locations • demonstrate work practices that avoid cable damage • install the three common types of earthing system used in customer premises for cabling systems • read and interpret drawings related to cable layouts, outlet location, cable coding system, and identifiers and distributor locations • conduct and interpret cable test results • interpret and apply requirements of relevant legislation, codes, regulations and standards • comply with all OHS requirements and work practices • meet ACMA knowledge test requirements.
Context of, and specific resources for assessment	Assessment must ensure: • a site on which communications cabling activities may be carried out • use of cabling and field equipment currently used in industry • licensing requirements and other site-related documentation.

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Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:
	
	• direct observation of the candidate terminating:
	  • systems at both distributor and outlet locations
	  • one jumperable distributor (campus distributor or building distributor) with a capacity of 100 pair or greater
	  • one non-jumperable distributor (LD) and a patch panel
	  • at least one 50 pair, one 4 pair and one Ethernet cable
	• review of completed documentation prepared by the candidate, including accurate completion of installation records, drawing alterations and compliance forms
	• oral or written questioning to assess required knowledge.

Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: ICTCBL2138B Install, maintain and modify customer premises communications cabling: ACMA Lift Rule. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment

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	modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Open cabling work refers to:	• aerial and underground cabling work on private and public property • customer cabling that terminates directly at the network boundary on a socket, network termination device (NTD)or a distributor.
Regulatory environment refers to:	• accredited registrars and registration • ACMA • Certified Components List (CCL) • Communications Alliance • labelling requirements • Telecommunications Act 1997.

Cabling environment may refer to:	• indoor environments, including concealed locations:
	  • ceilings and false ceilings
	  • internal wall space
	  • modular workstations
	  • under floor
	• outdoor environments, including cable installations:
	  • aerial telecommunications cabling for restricted cabling work, which does not include installations on poles shared with low voltage (LV) or high voltage (HV) electrical power cables or terminations
	  • external walls
	  • underground cabling in an exclusive trench or shared trench with electrical LV cables and other utilities.

Cable type may include:	• aerial • coaxial • copper twisted pair • data cables: Category 5, 6, 6A, 7 or 7A • external • indoor • optic fibre cable • underground.
Cable identification	• cable conductor identification codes: • banded

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refers to:	• colour coded • lettered • numbered.
Termination systems may include:	• jumperable distributor (campus distributor or building distributor) • non-jumperable distributor (local distributor) and a patch panel.
Earthing and protection may include:	• earthing of screened cable, barriers and cable trays for the reduction or elimination of interference from electromagnetic, radio frequency (RF) and power sources • equipotential bonding conductors to multiple earth neutral (MEN) and use of earth stakes • functional earths, including TRC and CES types to provide customer switching system facilities • protective earth barriers for segregation, cable tray, duct and metal equipment enclosures • protective earths for over-voltage and surge or spike suppression according to AS/CA TS009:2013.

Records may include:	• building, cabling and equipment location plans
	• labelling of:
	  • distributor pairs
	  • distributor verticals
	  • equipment closets
	  • NTD record cards
	  • patch panels
	  • rooms
	  • telecommunication outlets
	• record books and cards:
	  • building distributors (BD)
	  • campus distributors (CD)
	  • floor distributors (FD)
	  • local distributors (LD)
	• TCA forms (TCA1 andTCA2).

Relevant legislation, codes, regulations and standards may include:	• accredited registrars and registration • AS Communications Cabling Manual (CCM) – Open • Australian Communications Industry Forum (ACIF) standards and codes • ACMA technical standards • AS/ACIF S008:2006 • AS/CA TS009:2013 • AS/NZS 3000:2007

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	• cabling security codes and regulations • CCL • labelling • overview of Telecommunications Act 1997.
Building infrastructure may include:	• availability and suitability of existing cabling trays and fixing systems • building hazards • elevated working • HV power • restricted access.
Cabling may include:	• aerial customer • external customer • indoor customer • underground customer.
Strategies to manage other infrastructure may include:	• appropriate separations • correct use of cable trays and support systems • fastening techniques.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light or non-visible laser
	  • RF emission
	• electrical supply and areas of earth potential rise (EPR) that require mandatory separation from communications cable
	• hazardous conduit as according to AS 1345:1995 conduit colours associated with a hazardous service.

Cable support structures may include:	• cable ducts may be closed or open
	• cable trays may be:
	  • galvanised steel or PVC
	  • perforated with low or high side
	  • single or multi-channel
	• line poles
	• pits and pipes
	• suspension catenary wire
	• wall and island mounted patched and jumperable distributors:
	  • BD
	  • CD
	  • FD
	  • LD.

Termination may include:	• Australian modular socket • Ethernet connectors terminated at both ends of an Ethernet

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	cable • jumperable distributor (campus distributor or building distributor) with a capacity of 100 pair or greater • Mode 3 alarm socket • NTD • non-jumperable distributor (local distributor) and a terminated patch panel • United States modular socket.

Separations refer to:	• correct separations between communications cable and other services:
	  • LV
	  • HV single core
	  • HV multi-core
	  • open terminations
	• separations covered by AS/CA TS009:2013.

Installation details may include:	• cable infrastructure • cable location and type.
Cabling details may include:	• interconnections • pair locations • pair numbering and labelling.

Unit Sector(s)

Telecommunications - Cabling

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ICTCBL2139B Apply safe technical work practices for cabling registration when configuring ADSL circuits

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Minor change to title, descriptor and performance criterion. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to gain proficiency in current work practices and methodologies used for Open and Restricted Cabling Registration.

It covers safe installation and alteration practices for configuring the Carrier NTD/ADSL Filter and Modem/Mode 3 socket/cabling for an alarm system connected to a monitoring station using a carrier line supporting an asymmetric digital subscriber line (ADSL) modem service.

Application of the Unit

Cablers, installers and technicians in the field apply the skills and knowledge in this unit in the context of technology convergence and digital subscriber lines (DSL) technologies as applied in the telecommunications industry.

It can be applied to installation, maintenance or upgrades of existing systems in voice, data or security systems.

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Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Build and test DC and AC circuits and telephone earthing	1.1 Identify any hazards and occupational health and safety (OHS) issues for a safe work site and notify appropriate personnel 1.2 Connect a series and a parallel ***DC and AC circuit configuration*** following ***safe work practices*** 1.3 Choose the appropriate ***test equipment*** and measure the values of ***electrical quantities*** of the circuits 1.4 Use ***calculations*** to verify the measured values of the electrical quantities in a series and in a parallel circuit configuration 1.5 Compare measured values to calculated values and determine the reasons for any variations 1.6 Evaluate results and determine the ***probable faults*** if relevant 1.7 Measure voltages present on a telephone line and compare to exchange battery voltage 1.8 Measure resistance to earth, ensuring an electrical earth in a telecommunications installation
2. Configure a safe ADSL circuit configuration with Mode 3 connection	2.1 Determine the effects of bandwidth, frequency and attenuation on ***xDSL circuits*** as used for broadband customer access 2.2 Design and configure an ***ADSL circuit*** from network boundary through to Mode 3 socket for an alarm system connected to a monitoring station 2.3 Configure connection to ensure that an ADSL circuit is not disconnected for safety reasons when an alarm activation in conjunction with a Mode 3 socket disconnects the plain old telephone service (POTS) circuit 2.4 Use a ***level 3 tester*** to verify correct termination and installation practices on a digital transmission line
3. Diagnose and rectify faults	3.1 Determine urgency and impact of faults and required response timeframe for clearance 3.2 Identify ***type of fault*** and determine most probable causes of fault from data and historical trends where available 3.3 Select tools and test equipment relevant to the system and type of fault 3.4 Diagnose fault in a methodical and safe manner using suitable ***fault-finding technique***

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	3.5 Isolate fault progressively to remove likely variables from diagnostic 3.6 Determine options to rectify the fault and present to customer for decision on rectification 3.7 Document test methods and results and file with other system installation records
4. Alter existing services	4.1 Identify existing and proposed cable systems for ***altering services*** to an existing installation 4.2 Plan alterations to cause minimal disruption to ongoing client activity 4.3 Use ***appropriate tools*** to safely ***terminate telecommunications cables and outlets*** 4.4 Identify and rectify any ***cable fault*** 4.5 Carry out alterations in a safe manner and according to both mandatory and recommended industry standards 4.6 Identify risks posed by contact with remote power feeding services 4.7 Test alteration and obtain sign-off from customer

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to listen and liaise with clients on technical and operational matters related to sign-off for alteration of services
- literacy skills to interpret technical documentation and incorporate technical language into written tasks, such as reporting on recommendations to minimise recurrent fault occurrence
- numeracy skills to:
  - interpret technical data, such as specifications of telecommunications networks
  - perform mathematical problem solving in AC and DC tasks and fault-finding
- problem-solving skills to apply AC and DC fault-finding techniques to different situations
- research skills to access technical information and sources to understand fundamental principles of telecommunication networks
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - select and use appropriate test equipment and practices to perform basic AC and DC testing
  - perform fault-finding tasks
  - alter services.
  -

Required knowledge

- application of binary number conversion and interpretation
- AC and DC electrical quantities, including SI units, OHS issues and the application of Ohm's law
- fault-finding techniques and use of testing equipment, including:
  - multimeter to measure DC voltage, current and resistance
  - continuity tester to check continuity wiring
  - testing of open circuits and short circuits
- overview of:
  - ADSL circuitry and configurations
  - digital transmission concepts, including installation practices and testing
  - procedures in altering existing services, including sign-off
  - difference between analog and digital signals.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • use concepts of ADSL application and design • use fault-finding techniques to locate cabling faults in telecommunications networks • use Ohm's law to solve DC and AC electrical problems • apply digital transmission principles and testing • use test equipment • alter existing customer services complying with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • a site where altering existing services for a customer may be conducted • appropriate AC and DC testing equipment • manufacturer's documentation and equipment • correct tools and measuring equipment currently used in industry.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate undertaking AC and DC measurements and fault-finding • oral or written questioning to assess knowledge of fundamental concepts of telecommunications practices and recurrent fault-finding techniques • evaluation of written ADSL design concepts • direct observation of visual checks and evaluation of written procedures in altering existing services • direct observation of the candidate altering existing customer services.
Guidance information	Holistic assessment with other units relevant to the industry

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for assessment	sector, workplace and job role is recommended, for example: • ICTCBL2136B Install, maintain and modify customer premises communications cabling: ACMA Restricted Rule • ICTTEN2140B Use hand and power tools • ICTWHS2170B Follow work health and safety and environmental policies and procedures. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

DC and AC circuit configuration may include:	• DC circuit:
	  • resistances
	  • single DC voltage source:
	  • battery
	  • DC voltage supply
	  • solar panel
	• AC circuit:
	  • inductors, capacitors and resistances
	  • single AC voltage source:
	  • AC generator
	  • AC voltage supply
	  • alternator
	  • low voltage (LV) AC source.

Safe work practices may relate to:	• component tolerances are not exceeded
	• correct use of power supply and test equipment
	• identifying any electrical safety hazards
	• isolation from main supply
	• overdrawing of current
	• power down during set-up procedure
	• well laid out circuitry:
	  • avoid contact with external sources
	  • avoid shorting of components.

Test equipment may include:	• digital multimeter • multimeter • ohmmeter • voltmeter.
Electrical quantities may include:	• current • power • voltage.
Calculations may include:	• application of Ohm's law • engineering notation • power calculations

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	• power consumption and efficiencies • voltage dividers • voltage, resistance and current calculations.
Probable faults may include:	• faulty component • faulty source voltage • open circuits • short circuits.
xDSL circuits may include:	• ADSL • ADSL2 • ADSL2+.
ADSL circuit may include:	• ADSL filters connected at a main distribution frame (MDF) • central filters and splitters installed at a network termination device (NTD) • central filters and splitters installed internally • domestic installations and small shops that use a telecommunications outlet (TO) or NTD as a network boundary • DSL and Mode 3 connections.
Level 3 tester may include:	• continuity • F set • local area network (LAN) Cat tester • split pair • wire map.
Type of fault may include:	• cable • electrical • hardware • software • system.
Fault-finding technique may include:	• half term testing • isolation of sections • logical mapping • using testing equipment.
Altering services may include:	• changing cable installation • client interaction • identifying mission critical services • identifying remote power feeding • upgrading a service.
Appropriate tools may include:	• basic hand tools • F sets for cable identification • Krone termination tool

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	• multimeter • wire strippers.

Terminate telecommunications cables and outlets may include:	• stripping a:
	  • 2 pair internal rated
	  • 3 pair external rated cable
	  • 4 pair Category 5 unshielded twisted pair (UTP) cable
	• terminating a TO
	• termination using screw terminals.

Cable fault may include:	• earth contact • foreign battery • no voltage • open circuit • short circuit • split pair.

Unit Sector(s)

Telecommunications - Cabling

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ICTOPN4116A Use advanced optical test equipment

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to test optical communication systems and components using advanced optical test equipment. It involves using the optical time domain reflectometer (OTDR), optical spectrum analyser (OSA) and optical return loss (ORL) test set for performance testing and link budget calculation. Licensing, legislative, regulatory and certification requirements apply to working at heights. If an elevated work platform (EWP) is required, verify state or territory law requirements for a licence to operate an EWP. Users should confirm requirements with the relevant federal, state or territory authority. If working at heights, achievement of the unit 'CPCPCM2015A Work safely on roofs' from the CPC08 Construction and Plumbing Services Integrated framework training Package fulfils this requirement.

Application of the Unit

Application of the unit	Installation contractors, technical staff and field officers from telecommunications carriers or other private and public organisations, or regulatory authorities apply the skills and knowledge in this unit. They combine technical skills with organisational and administrative skills to perform specialised testing of complex optical faults, optical network monitoring and link budget calculations on broadband passive optical network (PON), fibre to the x (FTTx) networks, hybrid fibre coaxial (HFC) networks and dense wavelength division multiplexing (DWDM) systems during installation, maintenance, commissioning and troubleshooting phases.

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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to use advanced optical measuring instruments	1.1. Obtain ***relevant legislation, codes, regulations and standards*** for compliance when conducting work 1.2. Notify ***customer*** for site access, security arrangements and location details of ***optical system*** and test purpose 1.3. Identify site ***hazards*** and notify appropriate personnel to make site safe 1.4. Devise and implement risk control measures of hazards with handling of optical fibres and lasers in consultation with appropriate personnel 1.5. Prepare a ***testing plan*** indicating the ***type of measurement***, procedures and nominated ***wavelength*** and seek approval from customer 1.6. Select the appropriate ***tools*** and ***test instruments*** according to the required measurement and enterprise practice
2. Evaluate optical performance and link budget using advanced optical test equipment	2.1. Set up test instrument according to manufacturer's instructions and occupational health and safety (***OHS***) ***and environmental requirements*** 2.2. Perform measurement using knowledge of appropriate testing techniques and advanced test equipment in a safe manner to evaluate the performance of optical system and component 2.3. Record test results and compare with standard test specifications from manufacturer's and enterprise guidelines 2.4. Perform end-to-end measurements on an optical link to a customer and record test results and test points 2.5. Calculate the optical losses for a link budget figure of an optical link to determine if within operational margins as specified in manufacturer's manual 2.6. Evaluate the test results and report on the functionality of the optical component or equipment and the performance of the optical link
3. Document measurement results	3.1. Document test results for future reference and make recommendations on optimising component and system performance 3.2. Clean worksite and make safe according to the enterprise requirements and to customer satisfaction 3.3. Notify appropriate personnel of job completion for sign off and present test documentations

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customers and enterprise staff
- literacy skills to read and interpret work instructions and document work
- numeracy skills to gather and record data from measurements
- planning and organisational skills to plan prioritise and manage own work
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - clean an optical connector to an acceptable industry standard
  - safely inspect an optical connector for contamination and determine if cleaning is necessary
  - safely operate:
    - optical loss test set (OLTS)
    - optical time domain reflectometer (OTDR)
    - PON power meter

Required knowledge

- consequences of mating contaminated optical connectors
- decibels, dBm
- downstream and upstream signals
- DWDM metro and long haul system architecture
- measurement of DWDM signals
- measurement of gain and gain flatness of optical amplifier
- measurement of laser spectral stability, drift and unexpected variation in spectral transmission characteristics
- non-linear effects, four-wave mixing
- optical connector types
- optical signal to noise ratio (OSNR)
- optical spectrum limits, wavelengths used in various applications and International

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REQUIRED SKILLS AND KNOWLEDGE

Telecommunications Union (ITU) grid
• optical transmitters and receivers
• ORL
• OTDR dead zones, dynamic range and launch cable
• reflectance
• safe handling procedures with optical fibres
• transmission system line rates:
  • optical Ethernet
  • optical transport network (OTN)
  • synchronous digital hierarchy (SDH)
• wavelength division multiplexing (WDM), coarse wavelength division multiplexing (CWDM) and DWDM principles and optical multiplexers

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to :
	• use OTDR, OSA and ORL advanced optical test equipment to:
	  • measure optical power level
	  • measure insertion loss of optical network
	  • measure end-to-end fibre loss (bi-directional)
	  • test and calculate optical link budget
	  • comply with all related OHS requirements and work practices.

Context of and specific resources for assessment	Assessment must ensure: • sites on which optical measurements can be conducted • tools and equipment required for measurements • manufacturer's documentation for test instruments and equipment under test.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing optical measurements • review of a written report for the OTDR, the OSA and the ORL test set • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTOPN5118A Plan and configure dense wavelength division multiplexing systems • ICTOPN5119A Perform acceptance and commissioning tests on optical network • ICTOPN5120A Plan for an optical system upgrade

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EVIDENCE GUIDE	
	and cut over • ICTOPN5121A Test and commission a dense wavelength division multiplexing transmission system • ICTOPN5122A Test the performance of specialised optical devices • ICTOPN5123A Analyse and integrate specialised optical devices in the network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of

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RANGE STATEMENT	
the item, and local industry and regional contexts) may also be included.	

Relevant legislation, codes, regulations and standards may include:	• appropriate licences:
	  • crane
	  • EWP
	  • forklift
	  • winch
	• Australian Construction Industry Forum (ACIF) standards and codes
	• AS Communications Cabling Manual (CCM) Volume 1
	• AS/NZS 3000:2007
	• AS/NZS 3080:2003
	• AS/NZS 3084:2003
	• AS/NZS 3085.1:2004
	• AS/NZS IEC 61935.1:2006
	• AS/NZS IEC 61935.2:2006
	• AS/NZS ISO/IEC 14763.3:2007
	• AS/NZS ISO/IEC 15018:2005
	• AS/NZS ISO/IEC 24702:2007
	• cabling security codes and regulations
	• Environmental Protection Acts
	• OHS
	• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

Customer may be:	• asset manager • installation manager • maintenance manager • nominated customer representative • outage manager • project manager.
Optical system may contain:	• add-drop multiplexer • Bragg filters • DWDM system • fibre hub • HFC network • optical amplifier • optical line termination (OLT) • optical links • optical network termination (ONT) • optical splitter.

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RANGE STATEMENT	
Hazards may include:	• building debris • earth potential rise • glass fibre • live power lines • manual handling • mud and water • natural gas and other gas build up • optical fibre cable may contain hazardous light • radio frequency (RF) equipment emitting radiation • remote power feeding services which operate at above telecommunications network voltage (TNV) • vermin.
Testing plan may include:	• correct test set up • recording and evaluation of measurements • test layout • test procedures • test purpose • test sites and location • type of measurements • use of appropriate test equipment.

Type of measurement may include:	• dedicated ORL test set:
	  • optical power meter ORL
	  • ORL versus wavelength.
	  • OSA and ORL
	  • PON splitter ORL
	• OSA:
	  • bandwidth of a device (multiplexer)
	  • central wavelength and channel spacing
	  • device flatness
	  • DWDM channel uniformity
	  • insertion loss:
	  • coupler
	  • filter
	  • optical splitter
	  • WDM
	  • non-linear effects (four-wave mixing)
	  • optical power level:
	  • at drop terminal
	  • at optical transmitter

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RANGE STATEMENT	
	• at patch panel • at the OLT • at the ONT • optical signal to noise ratio (OSNR) • ripple • spectral purity of a source • spectral stability and drift of a source • OTDR: • break and fault location • certification of new cabling • characterisation of events in path • detailed event table • fibre attenuation • fibre attenuation rate • fibre attenuation uniformity • identification of 'gainers' • identification of 'ghost' events • insertion loss of connectors and splices • macro-bend detection • ORL • segment length.
Wavelength may include:	• 850 nm • 1310 nm • 1490 nm • 1550 nm.
Tools may include:	• alcohol swabs • dry type cleaning cassette for optical connectors hand tools • launch cable for OTDR • lint-free dry wipes • microscope for examining optical connector with: • integral safety infra-red filter • video microscope display • optical connector adaptors • FC to LC • FC to SC • FC to ST • SC to ST

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RANGE STATEMENT	
	• optical fibre mandrel (single mode fibre low reflection termination) • optical termination • optical reference cable.
Test instruments may include:	• ORL test set • OSA • OTDR multimode • OTDR single mode • PON optimised OTDR.

OHS and environmental requirements may include:	• decommissioning and isolating worksite and lines prior to commencement
	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves
	  • head protection
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses
	• safe working practices, such as the safe use and handling of:
	  • chemicals
	  • materials
	  • tools and equipment
	  • work platforms
	• special access requirements
	• environmental considerations:
	  • clean-up protection
	  • stormwater protection
	  • waste management.

Unit Sector(s)

Unit sector	Telecommunications

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Optical networks

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ICTOPN5119A Perform acceptance and commissioning tests on optical network

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conduct acceptance tests and commissioning tests on optical networks, including the optical portion of broadband hybrid fibre coaxial (HFC) networks, fibre to the x (FTTx) passive optical networks (PONs) and metropolitan and long haul dense wavelength division multiplexing (DWDM) networks. It ensures readiness of the new system through the application of appropriate inspections and tests to confirm compliance and specified performance. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technicians who install and maintain optical network equipment in access networks apply the skills and knowledge in this unit to provide services in Next Generation Networks (NGN) using emerging technologies. This unit applies to experienced field officers, technicians or technical supervisors working for telecommunications carriers, contractors or other service providers. NGN services include internet protocol TV (IPTV), video on demand (VoD), interactive TV, mesh networks and cloud computing.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to conduct acceptance tests	1.1. Obtain ***installation and commissioning documents*** and planning specifications from ***appropriate personnel*** to ensure the installed ***optical network*** is as planned and specified 1.2. Conduct visual inspection of new installation and verify compliance of the system against ***relevant legislation, codes, regulations and standards*** and accepted industry practice 1.3. Select and obtain required ***test equipment*** for suitability of acceptance testing 1.4. Prepare acceptance schedule and ***test criteria*** in consultation with appropriate personnel
2. Conduct acceptance testing	2.1. Conduct and evaluate ***performance tests*** to ensure measurements meet with predetermined specifications and approved operating margins 2.2. Verify performance levels to be within tolerance specifications set in manufacturer's instructions 2.3. Test ***protection mechanisms*** to ensure performance criteria meets the specified standard 2.4. Test ***alarms*** for satisfactory operation and refer identified problems to appropriate personnel for remedial action 2.5. Record all acceptance test procedures and results
3. Complete administrative tasks	3.1. Complete acceptance documentation including recommendations 3.2. Notify appropriate personnel and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analytical skills to interpret test equipment settings and readings • communication skills to: • liaise with customers and technical staff to ensure requirements are known and can be met within timeframes

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REQUIRED SKILLS AND KNOWLEDGE

• prepare reports and technical documentation
• literacy skills to interpret technical specifications, standards documents and related documentation
• numeracy skills to make calculations and necessary calibration changes
• planning and organisation skills to develop activity plans to undertake inspections and tests in efficient manner
• safety awareness skills to:
  • apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  • work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
• technical skills to correctly handle, connect and calibrate test equipment

Required knowledge
• cabling, terminations and supporting structures that may be encountered in the system under inspection • common performance levels and standards • electrical and optical properties to be measured • occupational health and safety (OHS) issues appropriate to the environment under inspection • overview of typical network topologies, switching, routing and transmission techniques • transmission type and signals that may be encountered • various test equipment types suitable for tests to be made

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • verify 'as built' installation against installation plans • undertake acceptance and commissioning tests and analysis against specified performance criteria • complete report, including acceptance test procedures, results and recommendations • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • sites on which acceptance tests may be conducted • use of testing equipment currently used in industry • relevant regulatory and equipment documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate undertaking acceptance tests • oral or written questioning to assess knowledge of tests and inspections types of systems and applications • review of completed acceptance documentation for systems and equipment prepared by the candidate, including recommendations.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN5059A Commission telecommunications network equipment • ICTTEN5092A Undertake outage management. Aboriginal people and other people from a non-English speaking background may have second language issues.

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EVIDENCE GUIDE	
	Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Installation and commissioning documents may include:	• agreed modifications to original design plan • commissioning test results • preliminary test results • recommendations from commissioning procedures.
Appropriate personnel may include:	• network manager • planning manager • project manager.

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RANGE STATEMENT	
Optical network may include:	• 10 Gbps ethernet local area network (LAN) services over the emerging global standard called optical transport network (OTN) • DWDM long haul system • DWDM metro system • gigabit Ethernet • optical portion of HFC network.
Relevant legislation, codes, regulations and standards include:	• Australian Communications Industry Forum (ACIF) standards and codes • Australian Communications and Media Authority (ACMA) technical standards • International Standards ISO 9000 and 9001 • ITU Standards • OHS • Privacy Act • private property law.
Test equipment may include:	• advanced network tester - synchronous optical network (SONET)/synchronous digital hierarchy(SDH) • optical power meters • optical return loss test set • optical spectrum analyser • optical time domain reflectometer (OTDR) • protocol analyser.

Test criteria may include:	• 24 - 72 hours test duration
	• live traffic tests
	• test environment
	• test margins and errors
	• testing at highest data rate:
	  • 10 Gbps
	  • 40 Gbps
	  • 100 GBps
	• topology:
	  • point to point link
	  • protected ring
	• normal and extreme load tests
	• using installed optical fibre during test.

Performance tests may include:	• end-to-end bit error rate (BER) test: • stressful pseudo random binary sequence (PRBS) pattern

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RANGE STATEMENT	

	• forward error correction (FEC) testing
	• G.709 testing
	• receive interface specification:
	  • received optical power
	• stability tests
	• transmit interface specification:
	  • optical output power.

Protection mechanisms may include:	• 1:1 protection • 1+1 protection • optical channel path protection • path protection • wavelength protection.
Alarms may include:	• audible alarms • on-screen display and monitoring systems • visual indicators.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Optical networks

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ICTOPN5120A Plan for an optical system upgrade and cut over

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan the activities of a major upgrade of optical systems from specifications provided by the planning and design section. Major upgrades in enterprise networks or telecommunications service provider's networks involve cut over activities to integrate additional work into existing network. The exponential growth of internet protocol (IP) traffic is driving IP optical integration, in particular the convergence of IP and dense wavelength division multiplexing (DWDM) networks in Next Generation Networks (NGN), necessitating regular system upgrades. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Field officers, technicians or technical supervisors from carriers, contractors or other service providers whose work involves upgrading optical systems and equipment in enterprise networks and service providers' core and access networks apply the skills and knowledge in this unit. They are involved in maintenance, upgrades and cut overs of emerging technologies in IP based telecommunications networks. Relevant jobs roles include a supervisor in charge of installation and maintenance teams responsible for the new installations and upgrades of telecommunications networks.

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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Gather information to prepare upgrade activity plan	1.1. Obtain ***relevant legislation***, ***codes***, ***regulations and standards*** for compliance when conducting work 1.2. Obtain design specifications from the planning and design section to determine the scope and ***nature*** of the ***upgrade*** 1.3. Analyse the design specification and design plan and determine the accuracy of the design plan to site installation and requirements with ***customer*** 1.4. Determine the ***network equipment*** types and obtain installation details from manufacturer 1.5. Prepare an equipment and component list and source vendors for procurement
2. Prepare upgrade activity plans	2.1. Prepare a detailed ***installation plan*** of the upgrade for the installer 2.2. Prepare a detailed ***installation procedure*** to carry out the upgrade to minimise impact to the customer 2.3. Prepare pre-installation ***optical tests*** on existing equipment to determine benchmarks and performance levels prior to the upgrade 2.4. Prepare post-installation optical tests on upgrade to ensure upgraded system is achieving the desired results 2.5. Prepare monitoring schedule to progressively assess the ***progress of the upgrade*** 2.6. Prepare ***contingency plan*** for backing out if upgrade is not progressing according to schedule and disruptions to customer are excessive 2.7. Prepare cut over procedures
3. Complete documentation	3.1. Update and produce ***documentation*** for submission 3.2. Submit planning activity document to planning and design section for approval

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Required skills

- analytical skills to evaluate impact of upgrades on customer, equipment and systems
- communication skills to provide advice and guidance and liaise with other technical staff on operational matters
- literacy skills to:
  - prepare:
    - installation plans
    - installation procedures
    - pre-installation tests
    - post-installation tests
    - contingency plans
    - cut over plan
  - read and interpret:
    - enterprise procedures, manuals and specifications
    - technical data, technical and non-technical information from a range of sources
    - test results
- numeracy skills to interpret technical data
- PC skills to monitor installed software
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
  - deal with unexpected situations on the basis of safety and specified work outcomes
  - prepare upgrade plan
  - troubleshoot common equipment and network problems
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards
  - follow enterprise occupational health and safety (OHS) procedures
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - analyse the impact of applications on traffic flow in the network
  - determine customer requirements and an upgrade plan
  - determine the impact of upgrading hardware and software on network functionality
  - identify the technical requirements, constraints and manageability issues for a given customer network requirement
  - implement upgrade of equipment and software

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REQUIRED SKILLS AND KNOWLEDGE
• use test equipment and monitoring tools • use tools and equipment to assemble and disassemble equipment
Required knowledge
• alarms • backup systems • computer knowledge • escalation and outage procedures • network management systems • overview knowledge of telecommunications networks and equipment • telecommunications monitoring tools • telecommunications test equipment and test setups • telecommunications wiring practices • upgrade and post-upgrade routines

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• prepare an upgrade plan incorporating the essential activities listed:
	  • detailed installation plan and installation procedures
	  • pre-installation and post-installation tests
	  • monitoring schedule to assess progress of the upgrade
	  • contingency plan.

Context of and specific resources for assessment	Assessment must ensure: • site where upgrade and cut over may be planned • use of equipment, software, test and monitoring equipment currently used in industry • relevant regulatory, equipment, enterprise and vendor documentation that impacts on work activities.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing upgrade • direct observation of the candidate performing tests and monitoring alarms • review of documents prepared by the candidate providing upgrade plan and assessing impact of upgrade taking into consideration customer feedback • oral or written questioning to assess knowledge of upgrade, testing and monitoring procedures.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4073A Cut over customer premises equipment major upgrades • ICTTEN4076A Complete equipment and software

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EVIDENCE GUIDE	
	upgrades • ICTTEN4086A Undertake routine maintenance of the telecommunications network • ICTTEN5061A Cut over new and replacement network equipment. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • Environmental Protection Acts • OHS Acts • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Nature of upgrade work may include:	• commission of new system • installation of new additional equipment • installation of new software • integration of new equipment into existing system • provision of temporary service • removal of redundant equipment • test on new system.

Upgrade may include:	• introducing dispersion compensation devices
	• moving to 40 Gbps technology
	• network capacity upgrade:
	  • additional optical fibres to be added
	  • additional DWDM wavelength channels and associated hardware to be added
	  • increase data rate by changing transmitter and receiver cards
	  • replace optical fibre with a type more suited towards 40 Gbps
	• upgrading from erbium doped fibre amplifiers (EDFA) to Raman optical amplifiers
	• upgrading laser transmitter power.

Customer may be:	• asset manager

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RANGE STATEMENT	
	• contractor • network planner • nominated customer representative • project manager • service provider.
Network equipment may include:	• asynchronous transfer mode (ATM) switch • dispersion compensation devices • enclosures • hubs • optical add drop multiplexer (OADM) • optical amplifier • optical filters • optical splitters • patch panels • regenerator • synchronous digital hierarchy (SDH) multiplexers • transponder shelf.
Installation plan may include:	• cable trays • detailed drawings and equipment layout • detailed list of equipment and types • earthing specifications • equipment locations • equipment mounting details • interconnecting cabling between racks • monitoring equipment • power feeds • rack positions • testing procedures • tools.

Installation procedures may include:	• setup procedures
	• monitoring progress according to plan
	• notification of network operations centre (NOC)
	• sourcing hardware and software
	• upgrade activity:
	  • installing optical equipment
	  • post-upgrade testing
	  • pre-update testing
	  • shutdown installation

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RANGE STATEMENT	
	• rectifying faults.
Optical tests may include:	• bit error rate test (BERT) • default settings • functional test • optical power levels • optical return loss • optical signal to noise ratio (OSNR) • performance tests.
Progress of upgrade may include:	• rate of deliverables against project timeline • risk management • timing.
Contingency plan may:	• be developed as part of the upgrade planning and design • be escalated and referred to more specialist team • invoke partial upgrade to be continued at later stage • invoke reversion procedure to pre-update condition.
Documentation may include:	• configuration details • implementation and testing procedures • network impact statement • software test results • system updates • test results and recommendations • upgrade details • vendor, equipment and enterprise specific details.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

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Co-requisite units		

Competency field

Competency field	Optical networks

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ICTOPN5122A Test the performance of specialised optical devices

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to test the performance of specialised optical devices for integration into existing optical networks. The integration of specialised optical devices into existing networks may be required as part of an upgrade for higher bandwidths required by services and applications of Next Generation Networks (NGN). No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical staff from telecommunications carriers, service providers or other private and public organisations who have experience in optical transmission apply the skills and knowledge in this unit. They combine this technical expertise with a range of analytical, research and planning skills to develop integration solutions for particular business needs. Relevant job roles include design and planning of networks using emerging technology.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to test specialised optical devices	1.1. Obtain ***relevant legislation***, ***codes***, ***regulations and standards*** and follow occupational health and safety (***OHS***) ***and environmental requirements*** for the given work 1.2. Work safely according to relevant safety legislation and company work practices identifying ***hazards*** and using ***personal protective equipment*** 1.3. Determine the type of ***optical device*** using the design plan from ***appropriate person*** and obtain manufacturer's ***specifications*** for testing 1.4. Determine the test procedures and ***test equipment*** required to evaluate suitability of the optical device
2. Test the specialised optical device	2.1. Set up the test layout according to safe industry practice and connect the specialised optical device into the test set-up 2.2. Undertake a ***test regime*** to determine the performance characteristics of the specialised optical device 2.3. Analyse the test results to determine the suitability and compatibility of the optical device for integration into the network
3. Document the performance of the specialised optical device	3.1. Prepare an evaluation report with recommendations on the suitability of the specialised optical device 3.2. Present test results and evaluation report to appropriate person with copies filed for later reference according to organisation's policies

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• analytical skills to interpret test results
• communication skills to:
  • liaise with internal and external personnel on technical and operational matters
  • relate to work associates, supervisors, team members and clients

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REQUIRED SKILLS AND KNOWLEDGE

- literacy skills to:
  - interpret technical documentation, such as equipment manuals, specifications and service orders
  - write reports using standard formats
- numeracy skills to interpret results and evaluate different types of technical data
- planning and organisational skills to plan, prioritise and monitor own work and that of others
- problem solving and contingency management skills to:
  - adapt testing procedures to requirements of particular situations
  - modify activities depending on operational contingencies, risk situations and environments
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities especially when dealing with infra-red laser light
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - backup and restore
  - clean optical fibre connector
  - examine optical fibre connector for contamination and assess whether cleaning is required
  - install software
  - measure optical power using hand-held optical power meter
  - measure DC and AC voltages
  - select and use appropriate test equipment
  - setup internet protocol (IP) addresses and subnet masks

Required knowledge

- amplified spontaneous emission (ASE)
- attenuation characteristics of optical fibres
- dense wavelength division multiplexing (DWDM) principles of operation
- features and operating requirements of test equipment including:
  - hand-held optical power meter
  - optical spectrum analyser
  - transmission test set
- dispersion characteristics of various fibres
- dispersion compensation devices

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REQUIRED SKILLS AND KNOWLEDGE
• electrostatic discharge precaution • functions of optical add drop multiplexer (OADM) and reconfigurable optical add-drop multiplexer (ROADM) • gain equalisation • International Telecommunications Union (ITU) wavelength grid for DWDM • measurement of dispersion • optical amplifier operation • optical fibre connector types and characteristics • optical fibre types and characteristics • optical return loss (ORL) • path protection and protection switching • polarisation dependent loss (PDL) • protocols used on optical DWDM systems • reflectance • ring topologies and linear network topologies • specific OHS requirements that impact on the safe inspection of optical connectors and the safe measurement of optical power from laser transmission systems • tunable laser sources and their characteristics

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and coordinate test activities and equipment • test specialised optical devices and determine suitability for integration into a network • analyse test results • report and make recommendations on suitability for integration • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • sites on which optical device testing may be conducted • use of test equipment currently used in industry • manufacturer's technical documentation, legislation, codes and standards.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing tests • review of test documentation and reports completed by the candidate • oral or written questioning to assess knowledge of testing procedures and required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTOPN5118A Plan and configure dense wavelength division multiplexing systems • ICTOPN5119A Perform acceptance and commissioning test on optical network • ICTOPN5120A Plan for an optical system upgrade and cut over • ICTOPN5123A Analyse and integrate specialised

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EVIDENCE GUIDE	
	optical devices in the network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) • Australian building codes and regulations

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RANGE STATEMENT	
	• compliance with appropriate Australian Communications and Media Authority (ACMA) technical standard requirements for underground, aerial, Category 5 or Category 6, 6A, 7 or 7A, and unshielded twisted pairs (UTP) • Environmental Protection Acts • fire regulations • Institute of Electrical and Electronics Engineers (IEEE) standards • OHS • relevant international standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

OHS and environmental requirements may relate to:	• decommissioning and isolating worksite and lines prior to commencement
	• flashing lights
	• gas and other hazard detection equipment
	• identifying other services, including power and gas
	• safety barriers
	• safety equipment
	• safe working practices such as the safe use and handling of:
	  • asbestos
	  • chemicals
	  • materials
	  • tools and equipment
	  • work platforms
	• special access requirements
	• suitable light and ventilation
	• trench guards
	• warning signs and tapes
	• witches hats
	• environmental considerations:
	  • clean-up protection
	  • stormwater protection
	  • waste management
	  • noise, dust and clean-up management.

Hazards may include:	• activating equipment without notifying other staff who may be working remotely on the

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RANGE STATEMENT	

	network
	• cleaning alcohol, epoxy resins and other solvents and chemicals may be carcinogenic, cause allergies or be dangerous to health in other ways
	• environmental hazards:
	  • air pollution
	  • damage to natural or heritage precincts
	  • dangerous gases
	  • ground water contamination
	  • heavy or noxious metals pollution
	  • noise
	  • petrochemical spillage
	  • release of hydrochlorofluorocarbons (HCFC)
	• flammable cleaning chemicals fluids and solvents
	• fibre offcut damage to eyes and skin
	• health hazards:
	  • dangerous or harmful substances
	  • handling of optic fibres and lasers
	  • risk of infection
	  • risk of sustained injury from repetitive tasks
	• inhalation of fibre offcuts and particles from vacuum cleaning of worksite
	• laser damage to eyes.

Personal protective equipment may include:	• inspection microscope with integral laser safety filter • safety glasses • video microscope.
Optical device may include:	• Bragg grating • coupler • dispersion compensation device (DCD) • DWDM multiplexer • erbium doped fibre amplifier (EDFA) • gain equaliser • Raman amplifier • ROADM.
Appropriate person may include:	• network engineer • project engineer

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RANGE STATEMENT	
	• project manager.
Specifications may include:	• bandwidth • insertion loss • operating wavelength • ORL • ripple.
Test equipment may include:	• broadband amplified spontaneous emissions (ASE) source • optical spectrum analyser • PDL controller • PDL meter • power meter • tunable laser source • variable attenuator.
Test regime may include:	• bandwidth • central wavelength and channel spacing • channel uniformity • insertion loss • ORL • PDL • ripple.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Optical networks

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ICTOPN5123A Analyse and integrate specialised optical devices in the network

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to analyse and integrate specialised optical devices into existing optical networks to support the higher bandwidths associated with Next Generation Networks (NGN). Carriers and service providers regularly upgrade existing infrastructures and extend the length of their networks' optical links due to expansion of NGN services such as voice, data and video. Performance testing of specialised optical devices is covered in a separate unit ICTOPN5122A Test the performance of specialised optical devices. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical staff from telecommunications carriers, service providers or other private and public organisations who have experience in optical transmission apply the skills and knowledge in this unit. They combine technical expertise with a range of analytical, research and planning skills to develop integration solutions for particular business needs. Relevant job roles include design and planning of networks using emerging technology.

Licensing/Regulatory Information

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Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Analyse specialised optical device and prepare for integration in the network	1.1. Obtain ***relevant legislation, codes, regulations and standards*** and follow occupational health and safety (***OHS***) ***and environmental requirements*** for the project work 1.2. Work safely according to relevant safety legislation and company work practices identifying ***hazards*** and using ***personal protective equipment*** 1.3. Obtain plans and drawings of existing ***optical network*** from ***appropriate person*** and review potential locations for suitability of integrating additional hardware 1.4. Analyse and evaluate a range of integration options using device ***specifications*** which satisfy the customer's network requirements 1.5. Prepare and submit the business case for adopting the recommended integration solution 1.6. Prepare design plan with interconnection details to existing system and ***installation options*** and seek approval to proceed from customer 1.7. Undertake an impact risk assessment of the hardware integration with the network operations centre (NOC) and prepare for contingencies using contingency plan
2. Integrate the specialised optical device in the network	2.1. Install and integrate ***specialised optical devices*** into existing network according to design plan 2.2. Test the network and evaluate the results to ***verify optical network performance*** with the integrated specialised optical devices in operation
3. Document the integration of the specialised optical device in dense wavelength division multiplexing (DWDM) network	3.1. Produce an updated design plan and submit to customer with copies filed for later reference according to organisation's policies 3.2. Prepare an evaluation report on the performance of the network with specialised optical devices with recommendations for future enhancements 3.3. Notify NOC of job completion and obtain sign off from appropriate person

Required Skills and Knowledge

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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate technical information and develop integration options
- communication skills to:
  - liaise with internal and external personnel on technical and operational matters
  - relate to work associates, supervisors, team members and clients
- literacy skills to:
  - interpret technical documentation, such as equipment manuals, specifications and service orders
  - write reports using standard formats
- numeracy skills to interpret results and evaluate different types of technical data
- planning and organisational skills to plan, prioritise and monitor own work and that of others
- problem solving and contingency management skills to:
  - adapt testing procedures to requirements of particular situations
  - modify activities depending on operational contingencies, risk situations and environments
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities especially when dealing with infra-red laser light
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - backup and restore
  - clean optical fibre connector
  - examine optical fibre connector for contamination and assess whether cleaning is required
  - install software
  - measure optical power using handheld optical power meter
  - measure DC and AC voltages
  - select and use appropriate test equipment
  - setup internet protocol (IP) addresses and subnet masks

Required knowledge

- attenuation characteristics of optical fibres
- DWDM principles of operation

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REQUIRED SKILLS AND KNOWLEDGE

• features and operating requirements of test equipment, including:
  • hand-held optical power meter
  • optical spectrum analyser
  • transmission test set
• dispersion characteristics of optical fibres
• dispersion compensation devices
• electrostatic discharge precaution
• functions of optical add drop multiplexer (OADM) and reconfigurable optical add-drop multiplexer (ROADM)
• gain equalisation
• International Telecommunications Union (ITU) wavelength grid for DWDM
• measurement of dispersion
• optical amplifier operation
• optical fibre connector types and characteristics
• optical fibre types and characteristics
• optical return loss (ORL)
• path protection and protection switching
• protocols used on optical DWDM systems
• reflectance
• ring topologies and linear network topologies
• specific OHS requirements that impact on the safe inspection of optical connectors and the safe measurement of optical power from laser transmission systems
• tunable laser sources and their characteristics

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse a specialised optical device and prepare a design to integrate it with a network • integrate and test the device • document the integration to the network and recommend enhancements • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • sites on which specialised optical device can be integrated • use of test equipment currently used in industry • manufacturer's technical documentation, legislation, codes and standards.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing integration • review of test documentation and reports completed by the candidate • oral or written questioning to assess required knowledge and skill.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTOPN5118A Plan and configure dense wavelength division multiplexing systems • ICTOPN5119A Perform acceptance and commissioning test on optical network • ICTOPN5120A Plan for an optical system upgrade and cut over • ICTOPN5122A Test the performance of specialised

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EVIDENCE GUIDE	
	optical devices. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant legislation, codes, regulations and standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1

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RANGE STATEMENT	
	• Australian building codes and regulations • compliance with appropriate Australian Communications and Media Authority (ACMA) technical standard requirements for underground, aerial, Category 5 or Category 6, 6A, 7 or 7A, and unshielded twisted pairs (UTP) • Environmental Protection Acts • fire regulations • Institute of Electrical and Electronics Engineers (IEEE) standards • OHS • relevant international standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

OHS and environmental requirements may relate to:	• decommissioning and isolating work site and lines prior to commencement
	• flashing lights
	• gas and other hazard detection equipment
	• identifying other services, including power and gas
	• safety barriers
	• safety equipment
	• safe working practices, such as the safe use and handling of:
	  • asbestos
	  • chemicals
	  • materials
	  • tools and equipment
	  • work platforms
	• special access requirements
	• suitable light and ventilation
	• trench guards
	• warning signs and tapes
	• witches hats
	• environmental considerations:
	  • clean-up protection
	  • noise, dust and clean-up management
	  • stormwater protection
	  • waste management.

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RANGE STATEMENT	

Hazards may include:	• activating equipment without notifying other staff who may be working remotely on the network
	• cleaning alcohol, epoxy resins and other solvents and chemicals may be carcinogenic, cause allergies or be dangerous to health in other ways
	• environmental hazards:
	  • air pollution
	  • damage to natural or heritage precincts
	  • dangerous gases
	  • ground water contamination
	  • heavy or noxious metals pollution
	  • noise
	  • petrochemical spillage
	  • release of hydrochlorofluorocarbons (HCFC)
	• flammable cleaning chemicals fluids and solvents
	• fibre offcut damage to eyes and skin
	• health hazards:
	  • dangerous or harmful substances
	  • handling of optic fibres and lasers
	  • risk of infection
	  • risk of sustained injury from repetitive tasks
	• inhalation of fibre offcuts and particles from vacuum cleaning of worksite
	• laser damage to eyes.

Personal protective equipment may include:	• inspection microscope with integral laser safety filter • safety glasses • video microscope.
Optical network may include:	• coarse wavelength division multiplexing (CWDM) • DWDM • Hybrid fibre coaxial (HFC).
Appropriate person may include:	• customer • network manager • project engineer • project manager.

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RANGE STATEMENT	
Specifications may include:	• bandwidth • insertion loss • operating wavelength • optical return loss (ORL) • ripple.
Installation options may include:	• location at intermediate location • location at OADM site • location at terminal site • location underground.
Specialised optical devices may include:	• Bragg grating • coupler • dispersion compensation device (DCD) • DWDM multiplexer • erbium doped fibre amplifier (EDFA) • gain equaliser • Raman amplifier • ROADM.
Verify optical network performance may include:	• stability test • bit error ratio test (BERT).

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Optical networks

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ICTPMG8142A Manage a telecommunications workplace

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to fulfil workplace management responsibilities at a managerial and supervisory level in a telecommunications business environment. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Telecommunications engineering staff with management responsibilities apply the skills and knowledge in this unit. They combine technical skills with management skills to manage technical staff in an advanced technological environment.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Support human resources activities	1.1. Assist and advise on recruitment action and induction of new staff 1.2. Monitor staff training needs and implement technical training activities for staff 1.3. Provide information and advice to ***relevant personnel*** 1.4. Review and advise on occupational health and safety (OHS) and security in the workplace
2. Manage conflict in the workplace	2.1. Assess conflict situation 2.2. Determine ways to resolve conflict with conflicting parties 2.3. Apply ***decision-making procedures*** to the business model for conflict resolution
3. Apply quality management systems and processes in the workplace	3.1. Determine essential requirements of a product using a quality management approach 3.2. Assess the relationship between ***customer and owner*** to identify process to achieve agreement on measurable quality features 3.3. Analyse quality investigation for improvement by involving individuals, groups and managers
4. Monitor work practices to ensure business objectives will be met	4.1. Develop strategies using ***management characteristics*** to meet business objectives 4.2. Analyse individual management objectives that would be applicable to the workplace 4.3. Produce a business model representing the activities of a sound management plan for a telecommunications workplace
5. Determine human factors when managing people and groups	5.1. Establish consultation processes between management and staff to resolve grievances 5.2. Analyse the interpersonal skills required of managers and team leaders using identified ***communications channels*** 5.3. Conduct discipline and performance feedback in the workplace to evaluate consultation processes, including principles of equal employment opportunity (EEO), cultural diversity and change management
6. Perform work using self-organisation	6.1. Evaluate methods of improving own productivity and perform a self-appraisal

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ELEMENT	PERFORMANCE CRITERIA
principles	6.2. Evaluate the effectiveness of ***information processing*** methods used in the workplace applying time management techniques 6.3. Produce a report to communicate information efficiently and effectively in the workplace
7. Apply effective communication techniques to business meetings	7.1. Research the levels, directions and effectiveness of ***channels*** used when communicating in business 7.2. Develop a plan for managing business meetings in the workplace

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• analytical skills to evaluate information
• communication skills to:
  • work effectively in a group
  • conduct oral presentations to a group
• conflict management skills to deal with grievances, disputes or disagreements
• information technology skills for word processing and desktop research
• initiative and enterprise skills to identify improvements to quality
• literacy skills to prepare reports
• planning and organisational skills to plan, prioritise and organise own work
• problem solving skills to resolve issues in the workplace
• research skills to gather data and information

Required knowledge

• equity and diversity principles
• management procedures and policies
• OHS requirements
• organisational policy and procedures
• overview knowledge of behaviour theories:
  • Herzberg's two factor
  • McClelland's acquired needs
  • Vroom's expectancy

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REQUIRED SKILLS AND KNOWLEDGE
• personal safety issues • public sector legislation, codes of practice and other formal agreements that directly impact on business operations • technical knowledge of telecommunications networks • workplace and industry environment

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • determine the human factors which need to be analysed when managing people and groups • conduct business meetings applying effective communication techniques • determine essential requirements of a product applying quality management principles • monitor and implement training for staff • resolve problems and conflicts in a business environment • support human resource management program.
Context of and specific resources for assessment	Assessment must ensure: • a telecommunications workplace • relevant enterprise documentation, including human resources (HR) and quality management policies.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate running a productive business meeting and effective interview techniques • oral or written questioning to assess the required knowledge and skills • review of quality reports prepared by the candidate • evidence of consultations with staff and management.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example: • ICTPMG8143A Manage a telecommunications project. Aboriginal people and other people from a non-English

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EVIDENCE GUIDE	
	speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel may include:	• colleagues • employee groups • managers • OHS committees and other people with specialist responsibilities • employees • specialist resource managers

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RANGE STATEMENT	
	• supervisors • unions.
Decision-making procedures may include:	• objectivity • qualitative • quantitative • subjectivity.

Customer and owner may include:	• customer:
	  • external
	  • internal
	• owner:
	  • management
	  • shareholders.

Management characteristics may include:	• authority • coaching • consultation • control • delegation • duties • management hierarchy • mentoring • ownership • partnership • responsibility • skilling and training.
Communications channels may include:	• industrial relations • internal • pro-active • public relations • retro-active.
Information processing may include:	• classification • flagging • follow-up • procedures • storage.

Channels may refer to:	• oral
	• non-verbal
	• written:
	  • agendas
	  • minutes

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RANGE STATEMENT	
	• memos • letters and faxes • visual • electronic: • email • web notifications • social networking.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Project management

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ICTPMG8143B Manage a telecommunications project

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce a plan and manage a telecommunications project using project management processes.

Application of the Unit

Telecommunication systems managers apply the skills and knowledge in this unit to implement specified projects that may be for an installation or upgrade of the telecommunications network.

Their job roles include producing plans for projects, developing risk management strategies, preparing budgets, planning for contingencies, developing procedures for commissioning the project and archiving project documentation.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Prepare to manage a project	1.1 Develop a project proposal, including specific ***project management processes*** 1.2 Determine the role of major stakeholders and implications for the project 1.3 Develop a risk management strategy and present to stakeholders for agreement 1.4 Check for technical compliance of project with relevant standards 1.5 Select project management computer software 1.6 Conduct a skills audit of personnel and identify additional training requirements
2. Apply project management processes	2.1 Determine participants' responsibilities using critical path method (CPM) to draw a network diagram 2.2 Sequence and coordinate ***activities*** required for a specific project 2.3 Determine the critical path to optimise timing of the project deliverables 2.4 Assess the viability of project estimates by preparing a budget 2.5 Perform risk analysis to determine factors that may hinder the project deliverables 2.6 Assess the progress of the project with ***contingencies*** to manage risks 2.7 Determine any updates and recommendations in agreement with the customer 2.8 Prepare contract variations if required
3. Complete work and document activities	3.1 Select procedures for commissioning if required and finish the project 3.2 Produce final documentation with recommendations and present to customer 3.3 Document and archive project documentation 3.4 Obtain sign off

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate risks
- communication skills to work effectively in a group, present information and negotiate contract variations
- information technology skills for word processing, desktop research and using project management software
- literacy skills to prepare reports and contract variations
- numeracy skills to:
  - calculate budget requirements
  - determine workforce requirements
- problem solving skills to anticipate and respond to issues in project progress
- research skills to gather data, observe and analyse project issues.
-

Required knowledge

- organisational project management policy and procedures
- safety management:
  - personal protective equipment conforming to industry and occupational health and safety (OHS) standards
  - precautions required to minimise, control or eliminate hazards that may exist during work activities
  - relevant legislation, codes, regulations and standards
- workplace and industry environment:
  - commissioning procedures
  - industrial issues
  - roles and responsibilities
  - skills audit
- telecommunication communication systems
- site engineering
- project management processes and software.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • prepare and apply project management process to a telecommunications project using project management software • develop a plan to manage a telecommunication project with a risk management strategy, budget and contingencies • complete work and project documentation.
Context of and specific resources for assessment	Assessment must ensure: • a telecommunications site on which projects can be managed • computers and relevant computer software • relevant legislation, codes, regulations and standards.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • oral or written questioning to assess knowledge and skills in the project management process • direct observation of the candidate performing project management tasks • review of the candidate generated project documentation.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTPMG8142A Manage telecommunications workplace • ICTPMG7145B Undertake a telecommunications project • ICTPMG8149B Evaluate and use telecommunications management networks. Aboriginal people and other people from a non-English

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	speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Project management processes may include:	• calendaring • constraints • contingencies • CPM • critical paths • Gantt chart • PERT • project variables • reviews • salvage value • variations.
Activities may include:	• contracts and procurement • cost management • human resource (HR) management • project communications methods • project tracking • quality • risk • scope • time management.
Contingencies may include:	• increase staff numbers • reinstallation • replacement components • work amendments.

Unit Sector(s)

Telecommunications - Project management

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ICTPMG8149B Evaluate and use telecommunications management networks

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. Minor changes to unit descriptor, application and two performance criteria. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to analyse, evaluate and monitor business performance using appropriate network diagnostic models and tools in the management of open systems in IT/ICT communications networks.

Application of the Unit

Network, IT and engineering staff who analyse and monitor performance of telecommunications network apply the skills and knowledge in this unit.

Relevant job roles include managing and monitoring operational communications networks, such as asynchronous transfer mode (ATM), cellular networks, telephone exchanges and computer clusters.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

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Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Prepare to evaluate and use telecommunications management network	1.1 Research and evaluate network management architectures in common carrier and extended models 1.2 Evaluate features and functionality of the Standards Committee International Telecommunications Union (ITU-T) TMN architecture and network models 1.3 Research and evaluate techniques for collecting management information from network nodes using interrupts and polling 1.4 Analyse configuration management problems and produce an assessment report on solutions by integrated network management systems
2. Analyse fault management and accountability procedures	2.1 Evaluate effectiveness of fault management processes from beginning to resolution, including automation of fault management 2.2 Analyse reasons for alarm correlation with process analysis and apply ***fault identification*** to network problems
3. Plan for reliability and survivability	3.1 Research and produce a report on quality of service (QoS) in a telecommunications context, including relevant international standards and range and type of possible monitoring parameters for a QoS 3.2 Analyse reasons for service levels in a telecommunications context 3.3 Perform linear and exponential trend analysis on real or simulated data for a single ***monitoring parameter*** 3.4 Research and assess reliability and survivability in a telecommunications context with reference to disaster and security management policies and procedures 3.5 Develop a disaster recovery plan for a telecommunications network
4. Research and report network management techniques	4.1 Research how accounting records are generated and used for both voice and data networks 4.2 Analyse the process of generating bills from accounting records, configuration and customer information as appropriate 4.3 Research and report on network management ***techniques and standards*** used for the IT/ICT systems and networks 4.4 Research and report on standards used in the simple network management protocol (SNMP) network management model and the global system for mobiles (GSM) network

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	4.5 Analyse network management functions over a CNET network simulation or similar data network and produce a report on the findings

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate a range of complex technical data
- communication skills to work effectively within a group and present information
- information technology skills for word processing, using statistical data and desktop research
- literacy skills to prepare reports and read and interpret technical standards
- planning and organising skills to manage own work in short timeframes
- research skills to gather data and information
- technical skills to use telecommunications management networks.
-

Required knowledge

- administrative network management systems
- business model
- business processes
- enterprise solutions
- operations network management systems
- organisational policy and procedures
- workplace and industry environment.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• research and evaluate the architectural features and functions of network management systems
	• research and report:
	  • major features, configuration and functions of management systems
	  • on fault management and accountability procedures
	  • major features and functions of QoS agreements
	  • on network management techniques
	• analyse the major features of planning for reliability and survivability.

Context of and specific resources for assessment	Assessment must ensure: • a telecommunications operations site with a network management system • networked computers with relevant software.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • oral or written questioning to assess knowledge of network management • direct observation of the candidate performing network management functions within a telecommunication system • review of research reports prepared by the candidate.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example: • ICTRFN8180B Analyse a cellular mobile network system • ICTTEN8194A Investigate the application of cloud networks in telecommunications switching.

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	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Fault identification may include:	• congestion • major alarm • minor alarm • out of service • outage • trouble ticket.
Monitoring parameter may include:	• grade of service • bit errors • block errors.
Techniques and standards may include:	• ATM1 • integrated services digital network (ISDN) • synchronous digital hierarchy(SDH)/synchronous optical network (SONET).

Unit Sector(s)

Telecommunications - Project management

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ICTRFN8180B Analyse a cellular mobile network system

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to analyse the detailed architecture and operation of individual cellular mobile elements and develop a plan to integrate emerging cellular technologies.

Application of the Unit

Telecommunications engineers and senior technical officers apply the skills and knowledge in this unit to analyse and manage cellular mobile networks and prepare to upgrade to Next Generation Mobile Networks (NGMG).

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Research mobile network systems and interfaces to interconnected networks	1.1 Analyse the ***interfaces*** between a cellular mobile network and customers, including the public switched telephone network (PSTN) and internet to validate the interoperability of the individual systems 1.2 Research the ***latest generation*** of mobile radio systems and develop a plan for integration of ***emerging cellular technologies*** to meet future demands and customer expectations
2. Analyse constraints imposed by frequency spectrum allocations	2.1 Analyse techniques to ***increase system capacity*** for a fixed spectrum bandwidth 2.2 Plan the ***frequency allocation*** for a cellular network from the derived specifications 2.3 Develop a simulation that plots the ***carrier to interference radiation*** pattern for a given cell geometry in a reflective environment
3. Analyse the operations of the major subsystems of a cellular network	3.1 Evaluate the major ***subsystem functions*** of the cellular network and analyse the ***subsystem components*** to determine capability for upgrades 3.2 Research and report how the major subsystems ***interface to other network subsystems*** 3.3 Simulate the transmission path for a cellular network
4. Analyse system capability	4.1 Simulate traffic flow measurements in a microcellular environment 4.2 Produce an analytical report on cellular mobile convergence with a plan for cellular mobile system integration to existing networks

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
  - liaise with internal and external personnel on technical issues
  - work effectively within group
- literacy skills to:
  - interpret technical documentation
  - prepare documents in agreed format
- numeracy skills to:
  - take measurements
  - interpret results
- PC skills to:
  - carry out desktop research
  - do word processing
  - use statistical data
- planning and organisational skills to plan simulations to aid analysis
- problem solving and contingency management skills to:
  - adapt testing procedures to requirements of particular sites
  - modify activities depending on differing operational contingencies, risk situations and environments
- research skills to:
  - evaluate different types of technical data and compare with theoretical values and approved specifications
  - gather and record data from measurements
  - gather data, observe and analyse interfacing issues
- task management skills to:
  - adhere to all safety requirements
  - work systematically with required attention to detail
- technical skills to:
  - enable 'login' into cellular network elements for tests and analysis
  - recognise and interrogate cellular network elements alarms
  - recognise different transmission techniques
  - record fault conditions
  - select and use appropriate test equipment and practices to suit different network applications.
  -

Required knowledge

- allocations and bandwidth requirements of cellular systems
- approved specifications

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- efficiency and system capacity given the spectrum allocation, number of channels required and Grade of Service
- equipment subsystem diagnosis and repair procedures
- features and differences between major frequency bands and their allocation of licenses
- features and operating requirements of cellular test equipment
- interworking with existing systems
- key features of cellular mobile radio systems
- major element functions of a mobile radio system
- major frequency bands and their allocation of licenses
- microcellular systems
- minimising latency
- network components and their functions
- overview knowledge of transmission lines, transmitter and receiver architecture
- radio spectrum in use, specifying restrictions and characteristics
- radio frequency (RF) and electromagnetic energy (EME) hazards
- specific knowledge related to antenna performance and mobile components and their impact on mobile spectrum interference
- spectrum efficiency
- system configuration procedures
- testing network components
- the types of adjustments that need to be made when measuring cellular transmission
- the types of networks that will influence the transmission either on the radio path and/or transmission line.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan a frequency allocation for a cellular network • analyse techniques to increase system capacity for a fixed spectrum bandwidth • develop a plan for integration of emerging cellular technologies • analyse the interfaces between a mobile network and customers • research and report the interfacing of major subsystems to other network subsystems • produce an analytical report on cellular mobile convergence with a plan for cellular mobile system integration to existing networks.
Context of and specific resources for assessment	Assessment must ensure: • sites on which cellular network analysis, research and simulation may be conducted • use of test equipment currently used in industry • manufacturer's and enterprise technical documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • evaluation of reports prepared by the candidate • review of test documentation and reports completed by the candidate • oral questioning or written questioning to assess required.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTPMG8143B Manage a telecommunications project.

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	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Interfaces may include:	• A • Abis • Iu • Iur • Iub • Iu-CS (circuit switch) • Iu-PS (packet switch) • S1
Latest generation may include:	• 3G • high speed packet access (HSPA)
Emerging cellular technologies may include:	• 2 x 2 multiple input-multiple output (MIMO) • 4 x 4 MIMO • 4G • long term evolution (LTE) • SF-frequency division multiple access (FDMA)
Increase system capacity may include:	• cellular re-use • orthogonal frequency division multiple access – multiple input-multiple output (OFDM – MIMO) • OFDMA • overlay • underlay.

Frequency allocation may include:	• patterns:
	  • 7/21
	  • 4/12
	  • 3/9
	  • 1/1.

Carrier to interference radiation may include:	• carrier interference:
	  • carrier to adjacent (C/A)
	  • carrier to interference (C/I)
	  • carrier to reflection (C/R).

Subsystem functions may include:	• cellular elements: • AUC

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	• base station controller (BSC) • base transceiver station (BTS) • eNode B • node B • home location register (HLR) • HSS • mobile station (MS) • mobile services switching centre (MSC) • SAE • transcoder • visitor location register (VLR) • burst timing and content • logical channels • multiplexing • radio path • signal protocols.
Sub-systems components may include:	• alarm gathering unit • charging unit • clocking unit • common channel signalling unit • gateway gprs support node (GGSN) • HSS • MME • operation and maintenance unit • SAE gateway • serving GPRS support node (SGSN) • statistical unit.

Interface to other network sub-systems may include:	• application parts:
	  • Base Station System Application Part (BSSAP)
	  • integrated services user parts (ISUP)
	  • managed application provider (MAP)
	• SYGTRAN.

Unit Sector(s)

Telecommunications - Radio frequency networks

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ICTRFN8181B Analyse a satellite communications system

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to analyse the performance of a satellite communications system.

The analysis may be required for a new installation project or an upgrade of capacity or technology in an existing network or as a result of convergence to Next Generation Networks (NGN).

Application of the Unit

Supervisors and engineers who analyse satellite communications systems apply the skills and knowledge in this unit when writing specifications, planning, designing and implementing satellite communications systems.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Research satellite communication systems	1.1 Research ***satellite applications*** with various ***orbit*** types for assessing their spatial positioning for specific purpose 1.2 Analyse and report on the architecture, major subsystems and critical components in the communication systems of a recently launched commercial satellite 1.3 Research and report on ***multiple access techniques*** and their typical applications
2. Analyse uplink and downlink variables	2.1 Determine ***uplink and downlink criteria*** that impact on carrier to noise ratio 2.2 Determine up/down link criteria that impact on baseband signal to noise ratio 2.3 Determine the critical parameters of a satellite system 2.4 Research common types of baseband signal processing, their spectral and noise improvement parameters for determining criteria for link budget evaluations
3. Conduct a link budget analysis	3.1 Produce a satellite link budget and calculate link margin for a satellite system with ***specified modulation types*** 3.2 Analyse the relationship between the bit error ratio (BER) for a given energy per bit per noise power density (Eb/No) and forward error correction (FEC) parameter for determining the operational performance of the link
4. Analyse properties of geostationary satellites	4.1 Calculate the ***look angles*** for a geostationary satellite from any receiving location 4.2 Research and report on ***frequency re-use*** in conjunction with polarisation selection and the use of spot beams 4.3 Analyse and specify the major features of ***very small aperture terminal (VSAT)*** systems, and calculate link reliability in high rainfall regions

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to solve complex problems by making informed judgements and assumptions
- literacy skills to prepare reports following an analysis or evaluation
- planning and organisational skills to develop systems and procedures in solving complex mathematical formulas
- problem solving and contingency management skills to manage unforeseen issues
- research skills to gather and record data from measurements
- technical skills to visualise radio frequency (RF) systems on board operational satellite platforms.
-

Required knowledge

- antenna calculations:
  - gain
  - beamwidth
  - polarisation
  - effective isotropic radiated power (EIRP)
- BER
- carrier/noise ratio
- constellation and eye diagrams
- decibels, dB, dBm, dBW
- distance to satellite and typical delays
- frequency spectrum (satellite bands)
- G/T ratio
- geostationary orbit
- link budget calculation
- look angle calculations
- low earth orbiting (LEO) satellites
- modulation types:
  - n-FSK:
    - 2FSK
    - 4FSK
  - n-PSK:
    - 2PSK
    - 4PSK
    - 8PSK
    - 16PSK
  - n-QAM:
    - 16 QAM

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    - 256QAM
- spread spectrum:
    - direct sequence
    - frequency hopping.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse satellite communications system architecture • produce a satellite link budget and calculate link margin for a range of digital modulation types • calculate the look angles for a geostationary satellite from any receiving location • analyse and specify the major features of (VSAT) systems.
Context of and specific resources for assessment	Assessment must ensure: • site on which satellite analysis may be conducted • data, calculators and appropriate software tools.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing analysis • review of link budget documentation completed by the candidate • review of look angle calculation reports • oral or written questioning to assess knowledge of satellite communications systems.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTRFN7182B Produce a radio link budget. Aboriginal people and other people from a non English speaking background may have second language issues. Access must be provided to appropriate learning and

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	assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Satellite applications may include:	• broadcasting:
	  • broadcast satellite service (BSS)
	  • fixed service satellite (FSS)
	• defence
	• domestic communications
	• earth observation:
	  • mapping
	  • meteorology
	• international communications:
	  • Intelsat
	• global positioning system (GPS)
	• navigational.

Orbit may include:	• geostationary
	• inclined orbit
	• low earth orbiting (LEO):
	  • polar
	  • non-polar
	• Molniya highly elliptical orbit.

Multiple access techniques may include:	• code division multiple access (CDMA) • frequency division multiple access (FDMA) • hybrid multiple access schemes: • FDMA/time division multiple access TDMA • polarisation division multiple access (PDMA) • space division multiple access (SDMA) • time division multiple access (TDMA).
Uplink and downlink criteria may include:	• antenna gain • bandwidth • error correction bits • modulation type • path loss • transmitter power.
Specified modulation	• m-PSK:

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types may include:	• 8PSK • OQPSK • QPSK • M-QAM: • 16QAM • spread spectrum: • direct sequence • frequency hopping.
Look angles include:	• azimuth • elevation.
Frequency re-use may include:	• orthogonal polarisation • spatial discrimination directional beams.
Very small aperture terminal may include:	• availability • latency • multicast • topology.

Unit Sector(s)

Telecommunications - Radio frequency networks

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ICTSUS4183A Install and test renewable energy system for ICT networks

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install a renewable energy system and integrate it into the network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit is for technical staff who install ICT networks powered by renewable energy solutions. This results in more efficient systems with cost reduction while meeting sustainability targets.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to install renewable energy system	1.1. Prepare for given work according to ***relevant legislation***, ***codes***, ***regulations and standards*** 1.2. Arrange access to site according to required procedure 1.3. Assess extent of system implementation using feasibility report and ***organisational guidelines*** 1.4. Produce a report to meet the ***customer*** and ***organisational requirements*** 1.5. Liaise with ***appropriate person*** to obtain approval for the plans with recommendations 1.6. Determine and source ***renewable energy components*** according to the agreed plan
2. Install and test renewable energy system	2.1. Install and configure components according to occupational health and safety (***OHS***) ***and environmental requirements***, plan, manufacturer's and organisational requirements 2.2. Identify and resolve problems 2.3. Integrate the renewable system into the network 2.4. Test and enhance system performance to meet organisational requirements
3. Complete documentation and clean up worksite	3.1. Produce an evaluation report on the actual cost-benefits of implementing the renewable energy system to the organisation 3.2. Provide a support manual for the customer 3.3. Record all test results and records for the customer 3.4. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analytical skills to evaluate information from reports • communication skills to liaise with internal and external personnel on technical, operational and business related matters

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REQUIRED SKILLS AND KNOWLEDGE

• literacy skills to:
  • interpret technical renewable energy systems' installation manuals
  • process and present written and verbal information to a diverse range of people
  • write reports, design solutions and recommendations in required formats
• numeracy skills to assess cost benefits and renewable energy options
• problem solving skills to resolve installation problems
• research skills to determine requirements
• safety awareness skills to:
  • apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  • select and use required personal protective equipment conforming to industry and OHS standards
  • work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
• technical skills to evaluate alternate energy systems and their compatibility with existing power sources

Required knowledge

• broad knowledge of systems diagnostic features
• business processes
• client business domain, business function and organisation
• compatibility issues and resolution procedures
• configuration of internet protocol (IP) networks
• current industry accepted hardware products and renewable energy system products
• customer and business liaison
• documenting technical specifications
• linkage between processes
• technologies:
  • alternate energy, such as solar, wind, chemical
  • areas of the hardware relevant to configuration and testing
  • installation procedures
  • renewable energy system relevant to configuration and testing
  • renewable energy systems' functionality
  • set-up and configuration procedures
• vendor specifications and requirements for component installation

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • ascertain and meet client requirements for installation of a renewable energy system hardware • plan and connect the hardware components according to vendor and technical specifications.
Context of and specific resources for assessment	Assessment must ensure: • site on which renewable energy solutions can be implemented • renewable energy system currently used in industry • relevant documentation, feasibility studies, equipment manuals and other site related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out installation and testing activities • review of plans completed by the candidate for different sites • oral or written questioning to assess knowledge of legislation and safety procedures.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS5187A Implement server virtualisation for a sustainable ICT system • ICTSUS4185A Install and test power management software • ICTSUS4184A Install and test power saving hardware • ICTSUS4186A Install thin client applications for Power over Ethernet.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant legislation, codes, regulations and standards include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003

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RANGE STATEMENT	
	• AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • contract law • National Association of Testing Authorities (NATA) requirements • OHS • regulated or industry codes of practice including appropriate Australian Communications and Media Authority (ACMA) technical standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006 • Trade Practices Act.
Organisational guidelines may include:	• budget constraints • communication methods • dispute resolution • documenting procedures and templates • financial control mechanisms • infrastructure • operational costs.
Customer may include:	• department within the organisation • government department • person within a department • private organisation • third party.
Organisational requirements may include:	• diagnostic policy • preventative maintenance • problem solution processes • roles and technical responsibilities in the IT department • vendor and product service level support agreements • work environment.
Appropriate person may include:	• authorised business representative • infrastructure administrator

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RANGE STATEMENT	
	• network administrator • power systems manager • property manager • supervisor.
Renewable energy components may include:	• converter • deep cycle gel cells • inverter • regulator • solar cells • solar panels • wind generator.

OHS and environmental requirements relate to:	• decommissioning and isolating worksite and lines prior to commencement
	• identifying other services, including power and gas
	• safety equipment
	  • flashing lights
	  • gas and other hazard detection equipment
	  • safety barriers
	  • trench guards
	  • warning signs and tapes
	  • witches hats
	• safe working practices, such as the safe use and handling of:
	  • asbestos
	  • chemicals
	  • materials
	  • tools and equipment
	  • work platforms
	• special access requirements
	• suitable light and ventilation
	• environmental considerations:
	  • clean-up management
	  • clean-up protection
	  • dust
	  • noise
	  • stormwater protection
	  • waste management.

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Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS4184A Install and test power saving hardware

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and test power saving hardware components in servers, motherboards and other networking equipment installed in ICT applications. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical staff who specify, install or upgrade ICT networks apply the skills and knowledge in this unit.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to install and test power saving hardware	1.1. Arrange access to site according to required procedure 1.2. Assess extent of system implementation using feasibility report and ***organisational guidelines*** 1.3. Produce a report to meet the ***customer*** and ***organisational requirements*** 1.4. Liaise with ***appropriate person*** to obtain approval for the plans with recommendations 1.5. Determine and source ***power saving hardware components*** according to the agreed plan
2. Install, test and evaluate power saving hardware	2.1. Install and configure components and according to occupational health and safety (OHS) and environmental requirements, plan, manufacturer's and industry standards 2.2. Resolve identified problems 2.3. Test and enhance system performance to meet organisational requirements
3. Complete documentation and clean up worksite	3.1. Produce an evaluation report on the actual cost-benefits of implementing the power saving hardware to the organisation 3.2. Provide a support manual for the customer 3.3. Record all test results and records for the customer 3.4. Restore any changes made to the worksite to customer's satisfaction and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• communication skills to liaise with internal and external personnel on technical, operational and business related matters
• literacy skills to:
  • read technical documentation
  • write reports with design solutions and recommendations in required formats

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REQUIRED SKILLS AND KNOWLEDGE
• numeracy skills to assess cost benefits of power saving hardware • planning and organisational skills to plan, prioritise and monitor own work • problem solving skills to resolve installation issues • research skills to interrogate vendor databases and websites to identify solutions to meet client business specifications • technical skills to evaluate low power devices and methodologies
Required knowledge

• broad knowledge of systems diagnostic features
• business processes
• client business domain, business function and organisation
• compatibility issues and resolution procedures
• configuration of internet protocol (IP) networks
• current industry accepted hardware products
• customer and business liaison
• documenting technical specifications
• linkage between processes
• set-up and configuration procedures
• technologies such as:
  • areas of the hardware relevant to configuration and testing
  • installation procedures
  • power saving hardware functionality
• vendor specifications and requirements for component installation

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • ascertain and meet client requirements for installation and testing of power saving hardware • plan and connect the hardware components according to vendor and technical specifications.
Context of and specific resources for assessment	Assessment must ensure: • site on which energy saving solutions can be implemented • use of current power saving hardware currently used in industry • relevant documentation, feasibility studies, equipment manuals and other site related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out installation and testing activities • review of feasibility report and plans completed by the candidate for different sites • oral or written questioning to assess knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS4183A Install and test renewable energy system for ICT networks • ICTSUS4185A Install and test power management software • ICTSUS4186A Install thin client applications for Power over Ethernet • ICTSUS5187A Implement server virtualisation for a sustainable ICT system.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Organisational guidelines may include:	• budget constraints • communication methods • dispute resolution • documenting procedures and templates • financial control mechanisms • infrastructure

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RANGE STATEMENT	
	• operational costs.
Customer may include:	• department within the organisation • government department • person within a department • private organisation • third party.
Organisational requirements may include:	• preventative maintenance and diagnostic policy • problem solution processes • roles and technical responsibilities in the IT department • vendor and product service level support agreements • work environment.
Appropriate person may include:	• authorised business representative • infrastructure administrator • network administrator • power systems manager • property manager • supervisor.

Power saving hardware components may include:	• extremely low power motherboards
	• memory devices:
	  • compact flash
	  • electronic drives
	  • flash drives
	  • USB
	• power supply
	• processor.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

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Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS4185A Install and test power management software

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and test power management software in network elements. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit is for technical staff who specify, install or upgrade ICT networks.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to install power management software	1.1. Arrange access to site according to required procedure 1.2. Assess extent of software implementation using feasibility report and ***organisational guidelines*** 1.3. Liaise with ***appropriate person*** to obtain approval for the plans 1.4. Determine and source new software required
2. Install software	2.1. Bench test software for performance utilising available technology 2.2. Install and configure software according to occupational health and safety (OHS) and environmental requirements, plan, installation procedures and ***organisational requirements*** 2.3. Resolve identified technical problems
3. Complete documentation and sign off procedures	3.1. Document the installation and configuration process according to organisational guidelines 3.2. Provide user documentation 3.3. Notify ***customer*** and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to use information to meet organisational needs in a defined range of areas
- communication skills to:
  - interact with others
  - present information
  - question and actively listen to customers and vendors
- literacy skills to:
  - interpret technical installation manuals for renewable energy systems
  - process and present written information to a diverse range of people
- problem solving skills to meet a defined range of unpredictable problems

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REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
• areas of the hardware relevant to configuration and testing • current industry-accepted software products, with general features and capabilities • installation procedures • OHS requirements in relation to work safety, environmental factors and ergonomic considerations • power saving software functionality • set-up and configuration procedures • systems diagnostic features • vendor specifications and requirements for component installation

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • ascertain and meet client requirements for installation and testing of power management software • plan and connect the software components according to vendor and technical specifications across a variety of situations.
	Assessment must ensure: • site on which energy saving solutions can be implemented • use of current power saving software currently used in industry • relevant documentation, feasibility studies, equipment manuals and other site related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out installation and testing activities • review of plans completed by the candidate for different sites • oral or written questioning to assess methodology used.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS5187A Implement server virtualisation for a sustainable ICT system • ICTSUS4183A Install and test renewable energy system for ICT networks • ICTSUS4184A Install and test power saving hardware • ICTSUS4186A Install thin client applications for

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EVIDENCE GUIDE	
	Power over Ethernet. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Organisational guidelines may include:	• communication methods • documenting procedures and templates • measures to save power.

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RANGE STATEMENT	
Appropriate person may include:	• authorised business representative • client • supervisor.
Organisational requirements may include:	• preventative maintenance and diagnostic policy • problem solution processes • roles and technical responsibilities in the IT department • vendor and product service level support agreements • work environment policies and practices.
Customer may include:	• department within the organisation • person within a department • third party.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS4186A Install thin client applications for power over ethernet

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and configure thin client applications to enable power over ethernet (PoE) on a low powered workstation. Thin client refers to a remote office with low band width. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical staff who specify, install or upgrade ICT networks apply the skills and knowledge in this unit. This unit applies to energy and cost efficient installations to meet sustainability targets by remotely feeding PoE.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to install thin client applications	1.1. Assess extent of applications to be implemented using feasibility report and ***organisational guidelines*** 1.2. Highlight issues associated with adoption of Web 2.0 applications 1.3. Produce an implementation plan and present to ***customer*** 1.4. Liaise with ***appropriate person*** to obtain approval for the plans with any recommendations 1.5. Notify customer for site access
2. Evaluate appropriate applications	2.1. Develop criteria for Web 2.0 applications to satisfy enterprise needs 2.2. Test and evaluate Web 2.0 applications according to agreed criteria 2.3. Present findings to the customer with recommendations on Web 2.0 applications
3. Install hardware components and applications	3.1. Follow occupational health and safety (OHS) and environmental requirements according to plan and manufacturer's specifications 3.2. Develop implementation plans with prioritised tasks and contingency arrangements for minimum disruption to customer 3.3. Install ***hardware components*** and ***thin client software*** needed for the work according to network and ***organisational requirements*** 3.4. Bench test performance of applications 3.5. Resolve identified problems
4. Complete work and document activities	4.1. Document the installation and integration process according to organisational guidelines 4.2. Provide user documentation 4.3. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to:
  - interpret technical installation manuals
  - process and present written and verbal information to a diverse range of people
  - write reports, design solutions and recommendations in required formats
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving skills to resolve installation issues
- research skills to interrogate vendor databases and websites to identify solutions to meet client business specifications
- technical skills to evaluate thin client software and methodologies

Required knowledge

- business processes
- client business domain, business function and organisation
- compatibility issues and resolution procedures
- configuration of internet protocol (IP) networks
- customer and business liaison
- documenting technical specifications
- linkage between processes
- set-up and configuration procedures
- systems diagnostic features
- Web 2.0:
  - applications and functionality
  - areas of the Web 2.0 relevant to configuration and testing
  - current industry accepted Web 2.0 products
  - vendor specifications and requirements for Web 2.0 applications
  - Web 2.0 application procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • determine and meet client requirements for thin client applications • install and configure the components according to vendor and technical specifications.
Context of and specific resources for assessment	Assessment must ensure: • site on which remote power feeding applications can be implemented • relevant documentation, feasibility studies and equipment manuals.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out installation and configuring • review of plans completed by the candidate for different sites outlining resources required • oral or written questioning to assess required knowledge and methodologies used.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS5187A Implement server virtualisation for a sustainable ICT system • ICTSUS4183A Install and test renewable energy system for ICT networks • ICTSUS4184A Install and test power saving hardware • ICTSUS4185A Install and test power management software. Aboriginal people and other people from a non-English

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EVIDENCE GUIDE	
	speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Organisational guidelines may include:	• budget allocations • operational costs • organisational cost • projected growth • security.
Customer may include:	• banks • government department • hospitals

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RANGE STATEMENT	
	• private organisation • small and medium enterprises.
Appropriate person may include:	• network administrator • network manager • supervisor.
Hardware components may refer to:	• cards • power feeding • management of desktop systems and screens.

Thin client software may include:	• lockdown configuration software
	• management software:
	  • Axel technologies
	  • Citrix
	  • IGEL Technology
	  • Wyse
	  • Symantec
	• OS X Terminal server software
	• virtualisation software
	• windows based thin client software.

Organisational requirements may include:	• work environment • problem solution processes • roles and technical responsibilities in the IT department • vendor and product service level support agreements.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS5187A Implement server virtualisation for a sustainable ICT system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and integrate a virtual server in a network to replace multiple physical servers. This is done to reduce power requirements of individual servers. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to ICT technical staff who install server networks with energy and cost-efficient systems to meet sustainability targets.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to implement server virtualisation	1.1. Assess extent of virtualisation to be implemented using feasibility report and ***organisational guidelines*** 1.2. Analyse existing server infrastructure utilisation 1.3. Research and analyse alternative virtualisation scenarios including a risk analysis and relative comparisons of each consideration 1.4. Provide a brief report of proposed preferred plan and describe resources required 1.5. Liaise with ***appropriate person*** to obtain approval for the plans with any recommendations
2. Design virtual server specification	2.1. Confirm network operating system, ***server applications*** and server design with ***customer*** 2.2. Determine product and vendor architecture and ***equipment*** specifications 2.3. Determine technology and resources within ***business requirements*** and budget
3. Install virtual server	3.1. Follow occupational health and safety (OHS) and environmental requirements according to plan and manufacturer's specifications 3.2. Notify customer for site access 3.3. Create a detailed ***task*** list specifying stages and sequence of work required 3.4. Review hardware and ***software*** to ensure compatibility 3.5. Install the required operating system, additional tools or third-party software as specified in design 3.6. Patch the operating system and applications to ensure maximum security and reliability
4. Integrate and test virtual server	4.1. Determine tests to ensure virtual server ***integration*** 4.2. Develop the test plan referring to resources and network impact 4.3. Run the system tests according to test plan and record outcomes 4.4. Analyse the error report and make changes as required 4.5. Test required changes or additions 4.6. Validate changes or additions against specifications
5. Complete work and	5.1. Document the installation and integration process

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ELEMENT	PERFORMANCE CRITERIA
document activities	according to organisational guidelines 5.2. Provide user documentation 5.3. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• communication skills to liaise with internal and external personnel on technical, operational and business related matters
• literacy skills to:
  • interpret technical installation manuals
  • process and present written information to a diverse range of people
  • write reports, design solutions and recommendations in required formats
• planning and organisational skills to plan, prioritise and monitor own work
• problem solving skills to resolve installation issues
• research skills to interrogate vendor databases and website to identify different solutions to meet client business specifications
• technical skills to evaluate virtual servers and methodologies

Required knowledge

• business processes
• client business domain, business function and organisation
• compatibility issues and resolution procedures
• configuration of internet protocol (IP) networks
• current industry-accepted products
• customer and business liaison
• documenting technical specifications
• linkage between processes
• systems diagnostic features
• technologies:
  • power supply requirements and management
  • registered random access memory (RAM)
  • server design and network architecture
  • set-up and configuration procedures

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REQUIRED SKILLS AND KNOWLEDGE
• single and multiple processors • vendor specifications and requirements for software installation • virtual server functionality

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • determine and meet client requirements for installation and testing of virtual server • install, integrate and test virtualisation components according to vendor and technical specifications.
Context of and specific resources for assessment	Assessment must ensure: • site and equipment on which servers can be virtualised • server virtualisation currently used in industry • relevant documentation, feasibility studies, equipment manuals and other site-related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out installation, integration and testing of virtual server • review of plans completed by the candidate for different sites outlining design and resources required • oral or written questioning to assess knowledge of methodologies used.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS4183A Install and test renewable energy system for ICT networks • ICTSUS4184A Install and test power management software • ICTSUS4185A Install and test power saving hardware • ICTSUS4186A Install thin client applications for Power over Ethernet.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Organisational guidelines may include:	• budget allocations • operational costs • organisational cost • projected growth • security.
Appropriate person may include:	• IT consultant • IT specialist

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RANGE STATEMENT	
	• network administrator • network manager.
Server applications may include:	• database and data warehousing • directory services • file sharing • line of business applications • management • messaging • network and remote access • printer sharing • server virtualisation • terminal services • web services.
Customer may include:	• company representative • government department • private organisation.
Equipment may include:	• digital subscriber line (DSL) modems • hard drives • hubs • modems and other connectivity devices • monitors • peripheral devices • personal computer • personal digital assistant (PDA) • printers • switches • workstations.
Business requirements may relate to:	• application • network • people • system.
Task may include:	• activities • function • job • work.
Software may include:	• customised • in-house • open source software applications • organisation-specific software

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RANGE STATEMENT	
	• packaged software.
Integration may involve:	• power supply requirements and management • registered RAM • requirements for software installation • server design and network architecture • set-up and configuration procedures • single and multiple processors • vendor specifications.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS6233A Integrate sustainability in ICT planning and design projects

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to integrate sustainability concepts and policies into ICT planning and design projects. It involves accessing industry information and applying legislative and occupational health and safety (OHS) guidelines. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical managers, supervising technicians, project managers, consultants or contractors in organisations conducting ICT planning or design projects apply the skills and knowledge in this unit. Typical ICT projects involve upgrades of equipment hardware and software or new installations of Next Generation Networks (NGN) using emerging technologies.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to integrate sustainability into the planning and design stages of an ICT project	1.1. Evaluate suitable ICT ***projects*** into which sustainability can be integrated 1.2. Negotiate with the ***stakeholders*** to establish the extent to which sustainability is to be integrated 1.3. Research and identify suitable technology solutions applicable to the project 1.4. Gather power consumption data on ***ICT equipment*** required for an ***energy audit*** based on an ***agreed standard***
2. Devise strategies for incorporating sustainability into an ICT project	2.1. Determine and oversee implementation of ***short term technology solutions*** to achieve reduction of power consumption 2.2. Initiate and progress ***sustainable management principles*** which result in reduced environmental impact 2.3. Establish, regularly review and improve ***key performance indicators*** (KPI) on sustainability performance 2.4. Incorporate innovative planning and design rules for ICT projects which foster sustainability and environmental best practice
3. Analyse energy audit data	3.1. Identify ***energy usage*** within the scope of the ICT project and provide a ***detailed report*** 3.2. Estimate potential energy savings and payback periods for recommended actions 3.3. Estimate the carbon dioxide (CO_2) emissions for the nominated project 3.4. Evaluate the estimated CO_2 emissions with comparable ***benchmarks*** 3.5. Make recommendations in order of priority and give estimates of implementation costs on integration of sustainability for other ICT projects

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Required skills

- analytical skills to:
  - compare and evaluate effective technical solutions involving integration of sustainability
  - interpret technical specifications and related sustainability documentation
- communication skills to:
  - adjust communication to suit different audiences
  - liaise with customers to outline sustainability strategy benefits and how they can be incorporated into the project within specified timeframes
  - negotiate approvals and contract arrangements with suppliers and contractors
  - respond effectively to diversity
  - to consult on and validate policy
  - work as a member of a team
- literacy skills to:
  - document technical requirements and procedures
  - evaluate complex and formal documents such as policy and legislation
  - prepare written reports requiring precise expression, language and structures suited to the intended audience
- numeracy skills to:
  - analyse and confirm capacity requirements
  - calculate budget requirements and limitations
  - determine workforce requirements
  - estimate CO_2 emissions
- organisational skills to arrange relevant documentation and approvals
- planning and organisational skills to:
  - set out project requirements and priorities
  - make site access and equipment delivery arrangements
- problem solving skills to account for unexpected variations to requirements, and to effectively manage different points of view and dissenting stakeholders
- research skills to:
  - research and present information
  - gain and maintain relevant and current technical product knowledge
- technical skills to integrate sustainability into a technical project

Required knowledge

- best practice approaches relevant to own work area
- environmental or sustainability legislation, regulations and codes of practice applicable to industry and organisation
- equal employment opportunity, equity and diversity principles and OHS safety

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REQUIRED SKILLS AND KNOWLEDGE
implications of policy being developed • estimated CO_2 emissions • ICT power consumption calculations • policy development processes and practices • power consumption audit methodology • principles, practices and available tools and techniques of sustainability management relevant to the telecommunications industry • quality assurance systems relevant to own organisation • relevant industry competence • relevant organisational polices, procedures and protocols • systems and procedures to aid in the achievement of workplace sustainability

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and integrate sustainability into ICT projects by devising strategies to conserve resources • analyse energy audit data on enterprise resource consumption • develop and monitor policies for review and improvements, benchmarking against industry best practice and attempting new approaches continuously over time.

Context of and specific resources for assessment	Assessment must ensure:
	• sites on which planning, design and integration of sustainability may be carried out
	• relevant legislation, standards, guidelines, reports and equipment specifications and drawings
	• range of workplace documentation, personnel, information and resources:
	  • compliance obligations
	  • organisational plans
	  • work responsibilities.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate analysing energy audit data • review of policy developed and procedural documentation completed by the candidate outlining the approach taken • review of implementation strategy, plans and work plans completed by the candidate • evaluation of methods used to involve stakeholders in policy development, implementation and review.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended,

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EVIDENCE GUIDE	
	for example: • ICTPMG6033A Develop project management plan • ICTPMG6034A Prepare a detailed design brief • ICTTEN6206A Produce an ICT network architecture design. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Projects may include:	• advanced meter infrastructure (AMI)

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RANGE STATEMENT	
	• alternative energy cellular base station sites • equipment upgrades • introduction of new technology • passive optical network (PON) technology for fibre to the premises (FTTP) • smart grid partnerships • software upgrade.
Stakeholders may include:	• competitors • customers • employees • investors • media • regulators • society.
ICT equipment may include:	• data storage • firewall • multiplexer • printer • router • server • switch • telephone system • workstation.

Energy audit may refer to:	• AS/NZ 3598:2000:
	  • Level 1 consumption benchmark
	  • Level 2 preliminary assessment
	  • Level 3 economic analysis.

Agreed standard may include:	• AS/NZ 3598:2000 (or latest revision) • BS EN 16001:2009 Energy Management Systems • ISO 14001:2004 Environment.

Short term technology solutions may include:	• energy efficient hardware
	• hibernation of:
	  • hard drive
	  • LCD monitor
	  • workstation
	• multifunction devices
	• remote energy management
	• replacing desktop PCs with thin clients

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RANGE STATEMENT	
	• server virtualisation • use of videoconference technology.

Sustainable management principles may include:	• audit waste management procedures
	• improving the energy efficiency of ICT network equipment:
	  • reducing the need for air conditioning
	  • shutting down equipment during low demand
	• supply chain:
	  • driving ethical values through the supply chain
	  • engaging supplier's involvement in emissions reporting and continual improvement
	  • engaging suppliers who provide information on energy consumption and product lifecycles
	  • influencing suppliers to provide energy efficient products and services
	• procurement strategies:
	  • assessment of suppliers' environmental policies and procedures
	  • lowering of energy consumption or environmental impact of replacement products or services
	  • managing the environmental impacts of electrical and electronic equipment
	  • use of energy consumption and environmental impact as criteria in the process of awarding contracts.

Key performance indicators (***KPIs***) may include:	• kg CO_2 emitted per floor area occupied in permanent buildings • kg CO_2 emissions from company car fleet • percentage of timber used in construction from well managed, sustainable sources • percentage volume of material from sustainable sources • reduction of quantity (in 1000's kg) of ozone depleting gases used in air-conditioning equipment.
Energy usage may include:	• a percentage of overall energy use in this

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RANGE STATEMENT	
	project • individual equipment • location.
Detailed report may include:	• details of energy efficiency improvements • energy consumption records • energy saving practices and financial returns • energy use in graphical form • executive summary with recommendations • implementation costs • payback periods • review process • timelines.
Benchmarks may include:	• AccountAbility AA1000 Assurance Standard (2008) • BSI BenchMark • Carbon Disclosure Project (CDP) • Dow Jones Sustainability Index (DJSI) • Global Reporting Initiative (GRI) G3 guidelines (telecommunications sector supplement).

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Sustainability

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ICTSUS6234A Establish a business case for sustainability and competitive advantage in ICT projects

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to establish a business case to justify innovative implementation of sustainability in ICT projects. Organisations may gain competitive and operational advantage by developing sustainability plans which meet customer and stakeholder expectations and public and regulatory demands. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical managers, supervising technicians, project managers, consultants or contractors who have responsibility for conducting or managing ICT projects apply the skills and knowledge in this unit. This unit will prepare the participant in planning and conducting cost benefit analysis and return on investment for the implementation of sustainable schemes at the enterprise level

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare information for establishing a business case	1.1. Evaluate the proposed ICT project to determine the scope and potential of sustainability integration 1.2. Research ***appropriate sources of information*** relevant to the project to prepare the business case 1.3. Analyse and evaluate the ***expected goals*** of the project and relate the business case to broader organisational goals 1.4. Identify and consult with ***stakeholders*** to plan and validate options 1.5. Identify and report on any assumptions and known ***constraints*** that can impact on the project
2. Produce the Business Case for the ICT sustainability project	2.1. Evaluate the ***critical success factors*** to determine the vital strategy for the project to successfully implement sustainability and gain competitive advantage 2.2. Prepare a cost-benefit analysis and estimate ***overall benefit*** obtained by introducing or improving sustainability in the project 2.3. Prepare an ***estimate of costs*** over an appropriate time period and determine the potential the ***return on investment*** (***RoI***) 2.4. Evaluate and analyse ***alternative options*** to determine the benefits, disadvantages, costs and risks
3. Produce business case documentations	3.1. Validate the options with stakeholders and determine the recommended option 3.2. Prepare an implementation plan for the recommended option for the ICT project 3.3. Produce an ***executive summary*** of the proposal including the consequences of not implementing the sustainability activity

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

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REQUIRED SKILLS AND KNOWLEDGE

- analytical skills to compare and evaluate effective technical solutions involving introduction or improvement of sustainability
- research and writing skills to research and present information, and to prepare written business cases requiring precise expression, language and structures suited to the intended audience
- communication skills to:
  - prepare a press release regarding the level of achievement of sustainability benchmarks, environmental targets and performance highlights
  - liaise with customers to outline the resulting sustainability benefits
  - adjust communication to suit different audiences
  - respond effectively to diversity
  - work as a member of a team
  - consult on and validate policy
- literacy skills to:
  - prepare a business case
  - evaluate complex and formal documents, such as government policy and legislation
  - interpret technical specifications and related sustainability documentation
  - document technical requirements and procedures
- numeracy skills to:
  - determine workforce requirements
  - analyse and confirm capacity requirements
  - calculate budget requirements and limitations
  - perform calculations related to life cycle assessment (LCA)
- organisational skills to arrange relevant documentation and approvals
- planning and organisational skills to:
  - set out project requirements and priorities
- problem solving skills to account for unexpected variations to requirements, and to effectively manage different points of view and dissenting stakeholders
- research skills to gain and maintain relevant and current technical product knowledge
- technical skills to utilise sustainability software tools
- project management skills to undertake or manage a complex project

Required knowledge

- best practice approaches relevant to sustainability
- environmental and sustainability legislation, regulations and codes of practice applicable to industry and organisation
- equal employment opportunity, equity and diversity principles and occupational health and safety (OHS) implications of policy being developed

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REQUIRED SKILLS AND KNOWLEDGE
• policy development processes and practices • principles, practices and available tools and techniques of sustainability management relevant to the ICT industry • quality assurance systems relevant to own organisation • relevant industry competency • relevant organisational polices, procedures and protocols • relevant systems and procedures to aid in the achievement of workplace sustainability • ICT power consumption calculations • energy consumption and energy audit methodology • environmental impacts of products, processes, systems and services

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the following is essential: • candidate's involvement as a key person in establishing a business case to introduce or improve sustainability in an ICT project • implementation strategy, as part of the policy, that has been devised, implemented and reviewed showing a measurable improvement utilising the chosen benchmark indicators • communicating with stakeholders to discuss approaches to sustainability improvements development and implementation, and contributing to the resolution of disputes among stakeholders • using software systems for recording and filing documentation for measurement of current usage and using word processing and other basic software for interpreting charts, flowcharts, graphs and other visual data and information • reviewing and improving policies by identifying improvements and benchmarking against industry best practice and attempting new approaches continuously over time.
Context of and specific resources for assessment	Assessment must ensure: • sites on which preparation of a business case for introducing or improving sustainability in an ICT project may be carried out • access to relevant legislation, standards, guidelines, reports and equipment specifications and drawings • access to a range of workplace documentation and personnel, information and resources, such as compliance obligations, organisational plans, work responsibilities.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct questioning combined with review of

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EVIDENCE GUIDE	
	portfolios of evidence and third-party workplace reports of on the job performance by the candidate • review of policy developed and procedural documentation outlining the approach taken • review of implementation strategy, plans and work plans • analysis of methods used to involve stakeholders in policy development, implementation and review • evaluation of participation in sustainability work practices and programs • observation over time in relation to review of work area relating to policy and procedures being developed to assess measurement of resources used, hazards and compliance.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTPMG6033A Develop project management plan • ICTPMG6034A Prepare a detailed design brief • ICTTEN6206A Produce an ICT network architecture design Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include

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EVIDENCE GUIDE	
	equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Appropriate sources of information may include:	• International standards for environmental management - Life cycle assessment
	  • AS/NZS ISO 14040:1998
	  • AS/NZS ISO 14041:1999
	  • AS/NZS ISO 14042:2001
	  • AS/NZS ISO 14043:2001
	  • AS/NZS ISO 14048:2003
	• AS/NZS 3598:2000
	• BS EN 16001:2009
	• United States Environmental Protection Agency (EPA) - Life Cycle Assessment: Principles and Practice EPA/600/R-06/060 May 2006
	• Dow Jones Sustainability Index (DJSI).

Expected goals may include:	• achieving best practice in products, processes or services while protecting the environment without sacrificing profitability • enhancing company reputation • guiding new product development to reduction of resources and emissions • improving public perception • providing information on trade-offs of alternative processes, products and materials.
Stakeholders may include:	• business partners • community • customers • government organisations

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RANGE STATEMENT	
	• shareholders • staff • technical experts.
Constraints may include:	• existing business partnerships and arrangements • existing contracts or service level agreements • reluctance to accept change.
Critical success factors may include:	• customer satisfaction • increase in customers • new sources of business • positive cash flow • profit margin • quality of products and services • revenue growth.
Overall benefit may include:	• better use of workspace • employee satisfaction • enhanced brand value • enhanced company reputation • improved public perception • more reliable service to customers • tangible benefits and intangible benefits.
Estimate of costs may include:	• annual operating costs • capital costs • detailed breakdown of costs • recurring costs • summary of costs by category.
Return on investment (***RoI***) may include	• carbon trading • project life • rate of depreciation • simple RoI calculation.
Alternative options may include:	• a range of approaches • an option that achieves same result as preferred option • collaborative delivery • in-house delivery of the project • innovative approaches.
Executive summary may include:	• background to the proposal • introduction to the proposal • past and current environment

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RANGE STATEMENT	
	• rationale for establishing the business case at this time.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS7236A Manage improvements in ICT sustainability

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to reduce the sustainability related impacts of ICT operations through energy conservation, energy efficiency and changing user behaviour. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to individuals employed as an ICT consultant or in an ICT related role in planning and design of networks in an organisation. Work normally involves a high degree of autonomy or is within a management team with a high level of responsibility.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Critically analyse an organisation's ICT assets energy footprint	1.1. Audit and assess level and type of use across the range of ***ICT devices***, ***infrastructure*** and ***software*** 1.2. Audit and establish baselines of ICT energy consumption and other elements contributing to the organisation's carbon footprint 1.3. Assess ICT usage in relation to its contribution to the organisation's business goals and priorities 1.4. Determine critical issues for the organisation relevant to ICT usage and carbon footprint 1.5. Assess current ICT usage in relation to sustainable ***asset management*** 1.6. Apply industry ***best practice*** where appropriate
2. Develop ICT sustainability strategies and policy	2.1. Include goals for reduction of ***sustainability impacts*** and equipment ***life cycle management*** approaches in organisational policy 2.2. Check policy scope is consistent with ***industry standards and benchmarks*** and amend where necessary 2.3. Ensure policy reflects the organisation's commitment to sustainability as an integral part of business planning and as a business opportunity 2.4. Consult with ***stakeholders*** as an integral part of policy development, implementation and review processes 2.5. Recommend policy options based on effectiveness, timeframes and cost 2.6. Develop and produce strategies for implementation, monitoring, review and audit as part of the policy documentation.
3. Formulate technical and behavioural solutions to improve ICT sustainability	3.1. Determine and document hardware, software, network and interface requirements of solutions 3.2. Develop ***strategies*** to improve sustainability outcomes including for example energy efficiency and ***alternative energy sources*** 3.3. Develop guidelines for improving ***sustainability*** through asset management 3.4. Document requirements, resource allocations, training needs and implementation timelines for selected strategies and obtain sign off from relevant stakeholders

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ELEMENT	PERFORMANCE CRITERIA
4. Monitor and evaluate sustainability data	4.1. Develop criteria for measuring performance improvement 4.2. Identify trends that may indicate the need for remedial action and use to promote continuous improvement of performance 4.3. Modify policy and technical solutions in response to data analysis to ensure improvements are made 4.4. Determine scope, frequency and method of monitoring and reporting in consultation with stakeholders 4.5. Review data to ensure compliance with the management of sustainability and legislative requirements 4.6. Document findings and present to stakeholders

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to research, analyse and present information
- communication skills to consult with stakeholders
- literacy skills to:
  - read and evaluate complex and formal documents, such as legislation and technical reports
  - prepare written reports and other documentation requiring precision of expression and language and structures suited to the intended audience
- safety awareness skills to implement enterprise occupational health and safety (OHS) policy and procedures
- technical skills to:
  - quantify sustainability objectives, targets, achievements and measures
  - use relevant systems and procedures to aid in the achievement of ICT sustainability

Required knowledge

- energy efficiency and alternative energy sources
- hazard identification and control

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REQUIRED SKILLS AND KNOWLEDGE

• industry standards
• IT:
  • hardware
  • interfacing
  • networking
  • software
• legislation framework underpinning sustainability
• policy development processes and practices
• principles, practices and available tools and techniques of sustainability management in the ICT industry
• relevant ISO standards
• sustainability from a local, national and international perspective
• sustainability including ecological, economic and social issues

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse patterns of ICT use • develop policy that complies with regulatory requirements • develop a workable implementation strategy • formulate solutions to reduce ICT-based emissions • develop measurable criteria for reviewing improvement.

Context of and specific resources for assessment	Assessment must ensure access to reference materials, resources and equipment updated regularly to meet rapid changes to technology:
	• relevant reports:
	  • government
	  • Intergovernmental Panel on Climate Change (IPCC)
	  • scientific
	• conference papers
	• vendor white papers
	• resources, tools and networking equipment
	• suitable hardware and software
	• suitable bandwidth for internet connections
	• relevant legislation and regulations
	• manufacturers' technical specifications
	• relevant ISO standards.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate formulating and carrying out sustainability measures in operations • review of analyses and solutions developed by the candidate • review of monitoring and evaluations completed by the candidate

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EVIDENCE GUIDE	
	• oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS7235A Use ICT to improve sustainability outcomes. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and

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RANGE STATEMENT	
regional contexts) may also be included.	
ICT devices may include:	• copies or multi-functional devises (MFDs) • laptops • PC peripherals • PCs • printer.
Infrastructure may include:	• air-conditioned • cabling • data centre and IT facilities • data storage • power supply and distribution • router • server • switches.

Software may include:	• business systems software:
	  • customer relationship management (CRM)
	  • environmental resource management (ERM)
	• in-house software
	• operating system
	• sink wrapped applications
	• web services.

Asset management may include:	• deployment
	• disposal
	• operation
	• procurement:
	  • product evaluation
	  • product specification
	  • purchasing cycles
	  • vendor selection..

Best practice information may be found in:	• publications • reports • research papers • white papers.
Sustainability impacts may include:	• greenhouse gas emissions • resource consumption and disposal • social impacts.
Life cycle management may	• asset management:

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RANGE STATEMENT	

include:	• product evaluation
	• product specification
	• purchasing cycles
	• vendor selection
	• supplier chain:
	  • design
	  • manufacture
	  • transportation.

Industry standards and benchmarks may include:	• AS/NZ 3598:2000 (or latest revision)
	• BS EN 16001:2009Energy Management Systems
	• BSI BenchMark
	• Carbon Disclosure Project (CDP)
	• Dow Jones Sustainability Index (DJSI)
	• Global Reporting Initiative (GRI) G3 guidelines (telecommunications sector supplement)
	• ISO 14001 Environment AccountAbility AA1000 Assurance Standard (2008)
	• AS/NZ 3598:2000:
	  • Level 1 consumption benchmark
	  • Level 2 preliminary assessment
	  • Level 3 economic analysis.

Stakeholders may include:	• customers • federal government • local government • management • non-government organisations • shareholders • staff • state government • suppliers.
Strategies may include:	• broadband networking • energy efficiency and conservation • location of facilities • power management • virtualisation.
Alternative energy sources may include:	• cogeneration • fuel cells

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RANGE STATEMENT	
	• other renewable sources • solar • wind.
Sustainability may include:	• maximising utilisation • maximising value to business • reducing consumption.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS8237A Lead applied research in ICT sustainability

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan, conduct and report on applied research to influence strategic practices on ICT sustainability and outcomes within an organisational context. The unit also covers constructing an applied research strategy, using a range of applied research techniques, and analysing and presenting findings. The competitive context and the evolution of technologies in the ICT sector mean that the capacity to innovate is important. Energy and climate change strategies, supply chain and product responsibility and innovation are key factors in achieving sustainability targets. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to leaders or enterprise managers using applied research to enhance individual, team and organisational performance in sustainability. The intended purpose and approach to applied research may vary across a range of contexts and organisations. In this unit, the focus is on applied research to attain improved organisational outcomes. It involves leading a range of research activities and techniques that, in combination, can provide quality information to enhance the development of capabilities in an enterprise to reach sustainability targets.

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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not Applicable

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
1) Provide direction for the development of an applied research strategy for ICT sustainability	1.1 Provide vision for the ***applied research strategy*** to meet the sustainability requirements of the identified research purpose 1.2 Clarify and confirm ***applied research purpose*** and needs of the ***target group*** 1.3 Facilitate the development of policies and procedures in relation to conducting applied research for the enterprise 1.4 Guide the development of mechanisms for collecting and maintaining data in a systematic manner 1.5 Review ***factors affecting the reliability and validity*** **of data** 1.6 Review relevant research ethics and codes of conduct
2 Control the use of a range of applied research techniques and resources	2.1 Review and evaluate a range of ***applied research methods and theories*** and ***data collection techniques*** 2.2 Guide the selection of appropriate methods to gather and analyse data on sustainability relevant to the research project 2.3 Authorise access to ***appropriate sources of information*** relevant to the research project 2.4 Select ***sustainable management principles*** that will have the most sustainable impact on the project 2.5 Ensure ***relevance of the research*** through integrity of the data collected and analysis tools used
3 Promote findings	3.1 Ensure accuracy of data and research details and adherence to any ***legal requirements*** 3.2 Evaluate the relevance of collated and analysed data against the original applied research strategy 3.3 Evaluate the impact of findings 3.4 Recommend implementation strategies 3.5 Ensure documentation and presentation of ***research findings*** is in a clear and logical manner consistent with audience needs 3.6 Identify the need for and an appropriate approach to, further research 3.7 Promote research findings and the approach to further research

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to:
  - analyse and interpret structurally intricate information in the area being researched
  - evaluate effective technical solutions in sustainability implementation
- communication and teamwork skills to:
  - consult with target groups using a range of communication techniques
  - develop written texts which deal with complex ideas and concepts
  - present research findings creatively to meet audience needs
- literacy skills to:
  - document technical requirements and procedures
  - evaluate complex and formal documents such as policy and legislation
  - prepare written reports requiring precise formats and structures to suit target audience
- numeracy skills to:
  - analyse and confirm research findings such as carbon dioxide (CO_2) emissions and carbon footprint
  - perform statistical analysis of trends and changes
- initiative and enterprise skills to discover and source appropriate information, and to identify future implication of information and data collected
- planning and organising skills to:
  - construct an applied research strategy
  - initiate and design research methodology
  - manage an applied research project
- problem solving skills to:
  - analyse research
  - check the integrity of data collected
  - collect, organise, analyse and present data
  - conduct trend analyses
  - develop and examine the validity of the applied research strategy using a range of applied research techniques
  - evaluate a range of sustainable management principles
- self-management and learning skills to:
  - conduct research to develop capabilities and learning related activities
  - manage own time and determine priorities

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REQUIRED SKILLS AND KNOWLEDGE
• review and adhere to relevant ethics and codes of conduct • store data to maintain privacy and confidentiality of information • technical skills to: • select suitable technology and technical services • use a range of software tools to analyse technical data • use technology and web media to discover, access, collect and store data, information and research in a systematic manner • leadership skills to: • set research directions, make decisions and solve problems • manage, guide and influence research team members • communicate, motivate and facilitate research team interactions
Required knowledge
• environmental and sustainability legislation, regulations and codes of practice applicable to industry and organisation • audit methodology on ICT energy, waste, product life cycles and CO_2 emissions • principles, practices and available tools and techniques of sustainability management relevant to the telecommunications industry • communication processes and methods • data collection methods • legislation, regulations, policies, procedures and guidelines relating to handling or storing data, including privacy and freedom of information • presentation techniques • reporting methods • research ethics and codes of conduct • research tools and methods • selection of appropriate applied research techniques • leadership strategies relevant to a research environment

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• lead the formulation of a research proposal or plan which includes:
	  • specific research questions on sustainability
	  • valid population or sample size
	  • description of the geographical, cultural, social or institutional context within which the research will be carried out
	  • full description of the data collection methods
	  • analysis of the limitations to research design
	• lead the design of an applied research project using appropriate tools and techniques
	• design a research report with analysis of data, and valid and reliable findings
	• evaluate relevance of the research results
	• apply knowledge of applied research techniques.

Context of, and specific resources for assessment	Assessment must ensure: • research activity that relates to an actual workplace or simulated context and topic • range of tools and techniques appropriate to the given situations and research topic.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate • review of projects relating to conducting applied research conducted by the candidate • direct observation of the candidate applying research skills • oral or written questioning to assess knowledge of applied research.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS8238A Conduct and manage a life cycle assessment for sustainability. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Applied research purpose may be	• agreements

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RANGE STATEMENT	
contained in documents such as:	• research brief • research contracts • research guidelines • research statement.
Target group may include:	• community • content and media provider • end users • equipment vendor • government authority • investors • regulator • society • statutory authority • sustainability auditors • telecommunications service provider • user groups.
Factors affecting reliability and validity may include:	• access appropriate population • authenticity and reliability of data sources • capacity to generalise findings across the whole population • sample size • type or survey used to increase validity.
Applied research strategy may cover:	• analysis of industry specific trends, statistics and issues • collection of data to assist informed decision making, planning or risk management • data and information relating to strategy, policy, practices, or work processes developed and implemented by an organisation • formation of solutions to complex problems • information and analysis needed to develop a campaign, strategic plan, industry or sector plan and strategy, or to bargain effectively with employers • information and analysis to conduct a strategic or community campaign or activity • relationship or relevance of a theory, principle or practice to an immediate practical problem, issue or to test a proposed solution.
Applied research methods and theories may cover:	• methods such as: • action research

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RANGE STATEMENT	
	• case study • experience and intuition • experiments • interviews • mathematical models and simulations • participant observation • surveys • statistical data analysis • statistical surveys • content, textual analysis, theories and techniques, which will vary upon consideration of: • application of statistical methods • causal factors and dependant or independent variables • critical analysis • experimental, quasi-experimental, non-experimental • mathematical calculations • problem solving • qualitative or quantitative research • sampling and sample size.
Data collection techniques may include:	• collaboration with other experts or mentors • desk research • document research • field study • observation • physical items analysis • interviews • questionnaires • surveys.
Appropriate sources of information may include:	• Carbon Pollution Reduction Scheme (CPRS) • discussions with current industry practitioners and manufacturers • energy and climate change reports and policies • government departments • industry associations and organisations • industry standards • AS/NZ3598:2000 (or latest revision):

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RANGE STATEMENT	
	• Level 1 consumption benchmark • Level 2 preliminary assessment • Level 3 economic analysis • BS EN 16001:2009 Energy Management Systems • ISO 14001:2004 Environment • industry journals • Kyoto protocol documentation • organisational policies, procedures and journals • personal observations and experience • professional organisations • research papers, technical publications and manuals • web data from research establishments and universities.

Sustainable management principles may include:	• audit waste management procedures
	• improving efficiency of ICT network equipment:
	  • reducing air conditioning requirements
	  • shutting down of equipment during low demand and prolonged idle times
	• procurement strategies:
	  • assessment of suppliers' environmental policies and procedures
	  • lowering of energy consumption or environmental impact of replacement products or services
	  • managing the environmental impacts of electrical and electronic equipment
	  • use of energy consumption and environmental impact as criteria in the process of awarding contracts
	• supply chain:
	  • driving ethical values through the supply chain
	  • engaging supplier's involvement in emissions reporting and continual improvement
	  • engaging suppliers who provide information on energy consumption and product life cycles

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RANGE STATEMENT	
	• influencing suppliers to provide energy efficient products and services • total life cycle (TLC) analysis of product, processes and services.
Relevance of the research may be based on:	• available time and resources • feasibility of implementing the recommendations • findings of previous and current research • original research parameters and brief • quality and credibility of the methodology • value of its usefulness • value of the information and data.
Legal requirements may include:	• agreements with third parties that supply research or data • competency standards • contracts • copyright and privacy laws relating to physical materials and electronic technology • licensing • plagiarism • privacy • relevant commonwealth, state and territory legislation, policy, codes of practice and national standards • security of information.
Research findings may include:	• circulating publications for comment and critique on the internet • contributing to strategic policy • drafting publications or reports • presentations at seminars and conferences • providing data, plans, specifications and reports resulting in changed work practice/s or design/s • providing internal reports verbally, in writing or via presentations • publishing papers and articles for expert review and audiences • publishing reports and articles for lay audiences.

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Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTSUS8238A Conduct and manage a life cycle assessment for sustainability

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conduct a life cycle assessment (LCA) to investigate and evaluate the human health and environmental impacts arising from the provision of a product, process or service. A LCA is a systematic process that provides an estimation of the cumulative impacts and trade-offs resulting from all stages in the entire life cycle of the product, process or service, thereby facilitating informed decision-making to improve performance. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical managers, supervising technicians, project managers, consultants or contractors who have responsibility for conducting a LCA or managing those who conduct an LCA apply the skills and knowledge in this unit.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Define and scope project goal	1.1. Access ***appropriate sources of information*** relevant to the LCA project 1.2. Define the ***goal*** of the project 1.3. Specify ***information*** needed to inform decision-makers 1.4. Determine required level of ***specificity*** 1.5. Determine ***data organisation*** and display of results 1.6. Define ***scope of the study*** 1.7. Determine ***ground rules*** for performing the work
2. Conduct a life cycle inventory (LCI)	2.1. Generate a life cycle ***flow diagram*** 2.2. Develop a ***data collection plan*** for the LCI 2.3. ***Collect the actual data*** 2.4. ***Evaluate and document*** the LCI results
3. Conduct a life cycle impact assessment (LCIA)	3.1. Select and define ***impact categories*** 3.2. ***Classify LCI results*** to the impact categories 3.3. Model LCI impacts within impact categories using science-based conversion factors 3.4. Normalise potential impacts in ways that can be compared 3.5. Assign impact categories by ***grouping*** into one or more sets to facilitate the interpretation of the results 3.6. Assign ***weighting*** factors to emphasise the most important potential impacts
4. Interpret and evaluate results from the LCI and the LCIA and communicate them	4.1. Identify the ***significant issues*** based on the LCI and the LCIA 4.2. Evaluate ***completeness check***, ***consistency check*** and ***sensitivity check*** 4.3. Make recommendations for improving the product, process or service life cycle
5. Report results of the LCA study	5.1. Document the ***results of the LCA study*** 5.2. Finalise the report with a conclusion and make recommendations as a result of the LCA study

Required Skills and Knowledge

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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to compare and evaluate effective technical solutions involving life cycle aspects of sustainability, and to critically evaluate data quality
- communication skills to:
  - prepare a press release regarding the level of achievement of sustainability benchmarks, environmental targets and performance highlights
  - liaise with customers to outline the resulting sustainability benefits
  - adjust communication to suit different audiences
  - respond effectively to diversity
  - work as a member of a team
  - consult on and validate policy
- literacy skills to:
  - evaluate complex and formal documents such as policy and legislation
  - interpret technical specifications and related sustainability documentation
  - document technical requirements and procedures
  - prepare written reports requiring precise expression, language and structures suited to the intended audience
- numeracy skills to:
  - determine workforce requirements
  - analyse and confirm capacity requirements
  - calculate budget requirements and limitations
  - perform calculations related to LCA
  - estimate carbon dioxide (CO_2) emissions
- planning and organisational skills to:
  - set out project requirements and priorities
  - make site access and equipment delivery arrangements
  - arrange relevant documentation and approvals
- problem solving skills to account for unexpected variations to requirements, and to effectively manage different points of view and dissenting stakeholders
- research skills to:
  - research and present information
  - examine statistical databases
  - gain and maintain relevant and current technical product knowledge
- technical skills to utilise life cycle assessment software
- project management skills to undertake or manage a complex LCA project

Required knowledge

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REQUIRED SKILLS AND KNOWLEDGE
• best practice approaches relevant to own work area • environmental and sustainability legislation, regulations and codes of practice applicable to industry and organisation • equal employment opportunity, equity and diversity principles and occupational health and safety (OHS) implications of policy being developed • policy development processes and practices • principles, practices and available tools and techniques of sustainability management relevant to the telecommunications industry • quality assurance systems relevant to own organisation • relevant industry competency • relevant organisational polices, procedures and protocols • relevant systems and procedures to aid in the achievement of workplace sustainability • ICT power consumption calculations • power consumption and energy audit methodology • CO2 emissions estimation • environmental impacts of products, processes, systems and services

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • undertake a LCA for sustainability • undertake scoping and definition of goals of a LCA for sustainability • produce a LCI using relevant software and data collection strategies • use life cycle assessment and other software for researching and interpreting charts, flowcharts, graphs and other visual data and information • evaluate LCI and LCIA results, using completeness, consistency and sensitivity checks • make recommendations based on the results of the LCA study.
Context of and specific resources for assessment	Assessment must ensure: • sites on which planning, design and integration of sustainability may be carried out • relevant legislation, standards, guidelines, reports and equipment specifications and drawings • a range of workplace documentation and personnel, information and resources (such as compliance obligations, organisational plans, work responsibilities).
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate • review of projects relating to conducting applied research conducted by the candidate • direct observation of candidate applying research skills • oral or written questioning to assess knowledge of applied research.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTSUS8237A Lead applied research in ICT sustainability. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Appropriate sources of	• AS/NZS 3598:2000

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RANGE STATEMENT	

information may include:	• BS EN 16001:2009
	• Dow Jones Sustainability Index (DJSI)
	• International standards for environmental management - Life cycle assessment
	  • AS/NZS ISO 14040:1998
	  • AS/NZS ISO 14041:1999
	  • AS/NZS ISO 14042:2001
	  • AS/NZS ISO 14043:2001
	  • AS/NZS ISO 14048:2003
	• United States Environmental Protection Agency (EPA) - Life Cycle Assessment: Principles and Practice EPA/600/R-06/060 May 2006.

Goal may include:	• establishing baseline information for a process • guiding new product development to reduction of resources and emissions • identifying gaps in data • providing information on trade-offs of alternative processes, products and materials • ranking relative contribution of individual processes • selecting best product, process or service with least effect on human health and the environment • supporting product certification.

Information may include:	• changes to be made to reduce specific environmental impacts
	• impacts relevant to stakeholders and interested parties
	• products or processes which cause the least environmental impact
	• technologies or processes which cause least detrimental impact:
	  • smog
	  • acid rain
	  • particulates
	  • aquatic pollution.

Specificity may relate to:	• enterprise-specific versus generic products • internal enterprise use or public purposes • product-specific data versus generic data • product-specific versus generic study.

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RANGE STATEMENT	
Data organisation may include:	• equivalent use as the basis for comparison • a functional unit that appropriately describes the function of the product or process being studied • volume or weight as the basis for comparison.

Scope of the study may include:	• manufacturing
	• materials manufacture
	• packaging and distribution
	• product fabrication
	• raw materials acquisition
	• recycling and waste management
	• use, re-use and maintenance
	• variants:
	  • cradle-to-grave
	  • cradle-to-gate
	  • economic input-output life cycle assessment (EIOLCA)
	  • gate-to-gate
	  • well-to-wheel.

Ground rules may include:	• define the systems analysed
	• documenting assumptions or decisions made throughout the project
	• methodology used
	• quality assurance procedures:
	  • available time and level of resources
	  • internal review
	  • external review
	  • formal review process
	• reporting requirements
	• setting of boundaries
	• software used for modelling:
	  • EcoLab
	  • GaBi Software
	  • SimaPro
	• stating the basis for comparison.

Flow diagram may include:	• all alternatives under consideration:
	  • baseline system
	  • alternative systems
	• boundaries
	• mapping inputs and outputs (material and

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	energy) to a process or system • subsystems.

Data collection plan may include	• defining the data quality goals
	• developing a data collection worksheet or spreadsheet:
	  • data collection procedures
	  • data quality measures
	  • geographic scope
	  • presentation of results
	  • purpose of the inventory
	  • system boundaries
	  • types of data used
	• identifying data sources and types:
	  • equipment and process specifications
	  • equipment logs
	  • journals
	  • laboratory test results
	  • meter readings from equipment
	• identifying data types:
	  • measured
	  • modelled
	  • non-LCI data (data not intended for use in LCI)
	  • non-site specific
	  • sampled
	  • vendor data
	• identifying data quality indicators:
	  • completeness
	  • consistency
	  • precision.

Collect the actual data may include:	• atmospheric emissions
	• conversion of fuel units into energy units
	• co-product allocation
	• data categories:
	  • CO_2 emissions
	  • reporting emissions required by regulatory agencies
	  • reporting of all emissions

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	• direct contact with experts
	• efficiency of transportation mode:
	  • conversion of tonne-kilometres into fuel units
	  • litres (gallons) of diesel fuel
	• emissions generated from combustion of the fuels
	• energy input data
	• energy sources
	• illegal waste disposal included if data is available
	• industrial scrap
	• ISO 14041:6.5.3 (2004) allocation procedure
	• obtain non-specific inventory data
	• products
	• purchase LCI data
	• research
	• specific data versus composite data
	• site visits
	• solid wastes
	• transportation data:
	  • conversion to ton-miles or tonne-kilometres
	  • distance shipped
	  • weight of shipment
	• waterborne wastes.

Evaluate and document may include:	• air emissions
	• data parameter groups within a category
	• data parameters within a group:
	  • carbon dioxide (CO_2)
	  • chlorine (Cl)
	  • sulphur dioxide (SO_2)
	• define boundaries set
	• define systems analysed
	• describing the methodology used in analysis
	• presentation of information:
	  • graphical format
	  • tabular format
	• water borne waste solid wastes.

Impact categories may include:	• acidification

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	• aquatic toxicity • global warming • resource depletion • stratospheric ozone depletion • terrestrial toxicity.

Classify LCI results may include:	• assigning LCI results to impact categories:
	  • CO_2 emissions attributed to global warming
	  • NO_2 emissions attributed to ozone formation
	  • SO_2 emissions attributed to acidification.

Grouping may include:	• sorting of indicators by characteristics, such as:
	  • emissions:
	  • air
	  • water
	  • location:
	  • global
	  • local
	  • regional
	• sorting of indicators by a ranking system, such as:
	  • high priority
	  • medium priority
	  • low priority.

Weighting may include:	• determining weights to place on impacts
	• identifying the underlying values of the stakeholders
	• weighting methods:
	  • analytic hierarchy process
	  • modified Delphi technique
	  • decision analysis using multi-attribute theory.

Evaluate and report LCIA results may include:	• definition of systems analysed • description of methodology used in the analysis • description of the boundaries that were set • documentation of limitations • verify accuracy of LCIA results.
Significant issues may include:	• essential contributions for life cycle stages to LCI or LCIA results: • individual unit processes

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	• groups of processes
	• impact category indicators:
	  • emissions
	  • resource use
	  • waste
	• inventory parameters:
	  • emissions
	  • energy use
	  • waste.

Completeness check may include:	• all relevant information and data needed for the interpretation are available and complete
	• develop checklist to indicate each significant area represented in results
	• organise data by:
	  • life cycle stage
	  • processes
	  • type of data represented:
	  • environmental release to air
	  • raw materials energy
	  • transportation.

Consistency check may include:	• comparisons made on inconsistent data sources
	• comparisons made on data from different eras
	• data from plants using different technologies
	• data from technology based on different standards:
	  • European
	  • US.

Sensitivity check may include:	• evaluation of the reliability of results using:
	  • contribution analysis
	  • sensitivity analysis
	  • uncertainty analysis.

Results of the LCA study may include:	• administrative Information • details of the practitioner who conducted the LCA study • date of report • definition of goal and scope • life cycle inventory analysis: • data collection

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	• calculation procedures
	• life cycle impact assessment:
	  • methodology
	  • results of the impact assessment performed
	• life cycle interpretation:
	  • results
	  • assumptions and limitations
	  • data quality assessment
	• critical review (internal and external):
	  • details of reviewers and their affiliation
	  • critical review reports
	  • responses to recommendations.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability

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ICTTEN2140B Use hand and power tools

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to safely use hand and power tools in the workshop and on the worksite.

It involves preparing for work, selecting, using and maintaining hand and power tools and cleaning up.

Application of the Unit

Technical staff who use hand and power tools apply the skills and knowledge in this unit. They may make use of safety equipment and workshop facilities.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Prepare for work activity	1.1 Identify the type of work to be performed from ***work instructions*** 1.2 Select appropriate ***hand and power tools*** for the work to be performed 1.3 ***Set up and check tools*** for use according to available ***information*** 1.4 Examine ***work environment*** and plan work with tools to maximise safety and productivity 1.5 Clear and clean work area to make it free of obstructions and allow clear access to tools
2. Prepare work piece for tool use	2.1 Mount, support or align ***work piece*** correctly to the tool or machine to be used 2.2 Anchor work piece securely where necessary to prevent movement
3. Operate hand and power tools	3.1 Use hand and power tools according to industry and enterprise ***safe working practices*** 3.2 Use ***safety equipment*** during tool operation according to industry and enterprise safe working practices 3.3 Monitor tool operation continuously and discontinue use if abnormal operation occurs 3.4 Clean the work area on completion of work
4. Maintain hand and power tools after use	4.1 Clean and store tools according to industry and enterprise safe working practices 4.2 Report abnormal tool operation or other problems according to established procedures 4.3 Perform programmed maintenance of tools according to work role 4.4 Arrange inspection of power tools according to ***regulatory requirements***

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
  - liaise with colleagues on technical and operational matters
  - record and report procedures
- literacy skills to interpret and understand the information required for the preparation and application of hand and power tools including:
  - equipment
  - manufacturer's instructions
  - materials safety data sheets
  - quality assurance procedures
  - work instructions
- planning and organisational skills to manage time, organise priorities and plan work
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards associated with use of particular hand and power tools
  - select and use required personal protective equipment conforming to industry and occupational health and safety (OHS) standards
  - use relevant chemicals and cleaning agents and dispose of waste products
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- task management skills to work systematically with required attention to detail and adherence to all safety requirements
- technical skills to:
  - select and use appropriate hand and power tools
  - use technical information for tools, processes, materials and equipment.
  -

Required knowledge

- electrical and compressed air safety
- equipment types, characteristics, technical capabilities and limitations
- features and operating requirements of hand and power tools
- general housekeeping policies and procedures
- industry and work site terminology
- information required to operate equipment according to a test specification
- job safety analysis (JSA) or safe work method statement
- legislation, codes of practice and other formal agreements that impact on the work activity
- manufacturer’s requirements for safe operation of equipment
- materials commonly used in the industry
- material safety data sheets (MSDS) and materials handling methods
- operational, maintenance and basic diagnostic procedures
- power sources

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- specific OHS requirements relating to the activity and site conditions
- typical issues and challenges that occur onsite.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • interpret work orders relevant to the selection and use of tools • interpret specifications and instructions relating to the materials and equipment on which the tools are to be used • prepare work environment and set up tools for safe and effective use • perform work processes following all relevant safety requirements applying to the use of hand and power tools • monitor tool operation for correct operation during use • inspect completed work to verify correct tool operation and use • document and communicate work related information including reporting of faults and other problems • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • sites where hand and power tools may be used • use of hand and power tools currently used in industry • relevant regulatory and equipment documentation that impact on the use of hand and power tools.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate setting and checking tools for use • direct observation of the candidate operating hand and power tools according to industry and enterprise safe working practices • oral or written questioning to assess required knowledge.

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Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTWHS2170B Follow WHS and environmental policy and procedures. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Work instructions may include:	• charts and hand drawings
	• diagrams or sketches
	• MSDS
	• memos
	• plans
	• quality requirements:
	  • dimensions and tolerances
	  • material standards
	  • standards of work
	• recording and reporting of work outcomes
	• safe work procedures or equivalent related to using hand and power tools
	• signage
	• specifications
	• verbal or written and graphical instructions
	• work bulletins
	• work schedules.

Hand and power tools may include:	• hand tools:
	  • chisels
	  • crowbars
	  • files
	  • hacksaws
	  • hammers
	  • measuring equipment
	  • pliers
	  • pop riveting machines
	  • screwdrivers
	  • shovels
	  • spanners
	  • wire strippers
	• power tools:
	  • angle grinders
	  • circular saws

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	• drills • grinders • hammer drills • jig saws • lifting and hoisting equipment.

Set up and check tools may include:	• inspect tools for:
	  • damage
	  • missing components
	  • other defects prior to use
	• install operating components (bits or blades) in tools
	• set or adjust tools.

Information may relate to:	• Australian and enterprise quality standards and procedures • enterprise or external personnel • enterprise work orders and instructions • industry codes and symbols • job procedures • product change policies and procedures • tool manufacturers' specifications, operating procedures and setting instructions.
Work environment may include:	• client site • hazardous or exposed conditions • operational indoor workplaces • operational outdoor workplaces • restricted or confined spaces.
Work piece may include blocks of:	• aluminium • bronze • plastic • stainless steel • steel • wood.

Safe working practices may refer to:	• barriers or screens to control access and minimise dust and noise
	• clearing route for safe placement of leads
	• control of hazardous materials
	• emergency procedures related to equipment operation:
	  • emergency shutdown and stopping
	  • evacuation
	  • extinguishing equipment fires
	  • organisational first aid requirements
	• handling of materials

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	• identification of potential hidden hazards:
	  • 'blind' drilling in walls
	  • harmful gasses
	  • non-visible laser emission
	• place tools in safe positions when not in use
	• running electrical power leads to power supply so they are clear of traffic or covered where possible
	• use of fire fighting equipment
	• use of first aid equipment
	• use of tools and equipment
	• visually checking power leads for serviceability and safety
	• workplace environment and safety.

Safety equipment may include:	• earth leakage circuit breaker (ELCB)
	• personal protective clothing:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber
	  • head protection
	  • kneepads
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses
	• rubber mats.

Regulatory requirements may include:	• environment protection legislation • Federal, state and territory legislation • OHS legislation relevant to workplace activities • workers' compensation legislation • workplace agreements and awards.

Unit Sector(s)

Telecommunications - Telecommunications networks engineering

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ICTTEN4081A Locate, diagnose and rectify faults

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to locate, diagnose and rectify faults in telecommunications networks. Telecommunications networks include cabling, customer premises equipment (CPE), access, telephony, broadband deployment, local area networks (LAN), wide area networks (WAN) and internet protocol (IP) networks for enterprise and customer systems and installations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Telecommunications officers, communications cablers, installers of customer premises equipment, optical and radio frequency (RF) equipment, multimedia and IP networks apply the skills and knowledge in this unit.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to locate and rectify a fault	1.1. Prepare for given work according to ***relevant legislation***, ***occupational health and safety*** (***OHS***), ***codes***, ***regulations and standards*** and identified ***hazards*** 1.2. Arrange access to the site according to required procedure 1.3. Obtain information on the ***nature of fault*** from the ***customer*** 1.4. Obtain suitable ***testing tools and equipment*** and specify ***personal protective equipment*** 1.5. Conduct fault finding using methodical and safe practices suitable for system and problem type
2. Locate and diagnose the fault	2.1. Conduct ***appropriate test*** to identify ***type of fault*** 2.2. Isolate the fault progressively to remove likely variables from assessment 2.3. Locate the fault without undue interruptions to the customer activity in the shortest possible time 2.4. Notify the customer of the findings
3. Rectify the fault	3.1. Determine the options to rectify the fault and present them to the customer 3.2. Advise the customer of costs of any repair not covered by service agreement 3.3. Rectify the fault if in agreement with the client 3.4. Conduct the work in a manner which is safe to the repairer and the customer 3.5. Refer any unresolved faults to other parties for resolution or escalation if required
4. Complete documentation and clean up worksite	4.1. Advise the customer of successful fault clearance and secure sign off 4.2. Complete all records 4.3. Complete reports to justify the fault diagnosis and rectification methodology if required 4.4. Remove all waste and debris from worksite and dispose them according to environmental requirements 4.5. Restore any changes made to the worksite during fault repair to the client's satisfaction

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with clients on technical and operational matters and raise OHS issues
- literacy skills to interpret technical documentation and standards and incorporate technical language into written tasks including report on recommendation to rectify fault
- numeracy skills to interpret technical data, such as specifications of equipment operations
- problem solving skills to apply methodology in fault diagnosis
- research skills to access technical information and sources to assist fault identification
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - select and use required personal protective equipment conforming to industry and OHS standards
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to select and use appropriate methods for fault identification and rectification

Required knowledge

- fault-finding techniques and test equipment
- safety requirements and standards
- various client's workplace environment and practices
- various types of networks and equipment
- various types of networks and equipment faults and rectification

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • identify different faults • establish context and background information and determine and rank likely causes of fault • obtain suitable tools and equipment and apply simple checks, tests and fault-finding methodology • apply recommended means to rectify fault • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	Assessment must ensure: • site where fault identification and resolution may be conducted • use of test and related equipment currently used in industry • relevant technical specifications and requirements for telecommunications networks • regulatory and site-related documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate locating and rectifying faults following OHS requirements • oral or written questioning to assess knowledge of types of faults and implications • evaluation of written reports prepared by the candidate, outlining test result interpretation, fault rectification and recommendations.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example: • ICTOPN4115A Install and test a dense wavelength division multiplexer system • ICTTEN4051A Install configuration programs on PC

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EVIDENCE GUIDE	
	based customer equipment • ICTTEN4198A Install, configure and test an internet protocol network • ICTTEN4199A Install, configure and test a router. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant legislation, OHS, codes, regulations and standards	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM)

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may include:	Volume 1
	• AS/NZS 3000:2007
	• AS/NZS 3080:2003
	• AS/NZS 3084:2003
	• AS/NZS 3085.1:2004
	• AS/NZS IEC 61935.1:2006
	• AS/NZS IEC 61935.2:2006
	• AS/NZS ISO/IEC 14763.3:2007
	• AS/NZS ISO/IEC 15018:2005
	• AS/NZS ISO/IEC 24702:2007
	• cabling security codes and regulations
	• contract law
	• National Association of Testing Authorities (NATA) requirements
	• regulated or industry codes of practice including appropriate Australian Communications and Media Authority (ACMA) technical standards
	• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006
	• Trade Practices Act
	• OHS including specific OHS and environmental requirements:
	  • decommissioning and isolating work site and lines prior to commencement
	  • environmental considerations include:
	  • clean-up protection
	  • stormwater protection
	  • waste management
	  • noise, dust and clean-up management
	  • identifying other services including power and gas
	  • safety equipment:
	  • flashing lights
	  • gas and other hazard detection equipment
	  • safety barriers
	  • trench guards
	  • warning signs and tapes
	  • witches hats
	  • safe working practices such as the safe use

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	and handling of: • asbestos • chemicals • materials • tools and equipment • work platforms • special access requirements • suitable light and ventilation.
Hazards may include:	• building debris • earth potential rise (EPR): • event at a site, such as an electrical distribution substation may expose telecommunications personnel, users or plant to hazardous voltages • glass fibre • live power lines • manual handling • mud and water • natural gas and other gas build up • needle stick injury • optical fibre cable may contain hazardous light • radio frequency (RF) equipment emitting radiation • remote power feeding services which operate at above telecommunications network voltage (TNV) • vermin.
Nature of fault may include:	• cable fault • distortion • excessive latency • interference • intermittent • low signal level • network fault • no transmission • poor grade of service • poor signal quality.
Customer may include:	• fault centre • individual reporting the fault • network manager

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RANGE STATEMENT	
	• network administrator • network operations centre staff • site manager.
Testing tools and equipment may include:	• cable locater • cable test set • LAN Cat tester • network management system • optical fault locater • optical time domain reflectometer (OTDR) • protocol analyser • pulse echo test set • sniffer • spectrum analyser.

Personal protective equipment may include:	• electrical isolators
	• gas detectors
	• personal protective clothing:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber
	  • head protection
	  • kneepads
	  • masks
	  • protective suits
	  • safety boots
	  • safety glasses.

Appropriate test may include:	• bit error rate test (BERT) • cable tests • distortion • frequency measurement • insertion loss • packet sniffing • ping • protocol analysis • return loss • route test • signal loss: • optical

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	• RF.

Type of fault may include:	• cable fault:
	  • attenuation
	  • cracked fibre
	  • crossed wires
	  • crosstalk
	  • damaged coax
	  • faulty splice
	  • incorrect terminations
	  • moisture ingress
	  • open circuit
	  • short circuit
	• network fault:
	  • customer equipment
	  • drop out
	  • latency
	  • loss of addressing
	  • packet loss
	  • poor wireless connection
	  • routing problems.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4198A Install, configure and test an internet protocol network

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to carry out the installation of network hardware and software, initial configuration according to organisational requirements and testing of an internet protocol (IP) network. This may be part of the upgrade of an existing network or the implementation of a new network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. They would be employed by telecommunications companies and IT networking provisioning companies. They will gain knowledge of hardware and software installations, routing and switching protocols and diagnostics required for integrating new and converging functionalities to the network.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to install an IP network	1.1. Prepare for given work according to relevant legislation, occupational health and safety (OHS), codes, regulations and standards 1.2. Arrange access to the site according to required procedure 1.3. Review existing ***network*** design ***documentation*** to ensure it is current and complete 1.4. Select the ***components*** and ***network elements*** required to be installed to meet the technical ***requirements*** 1.5. Contact vendors and service suppliers to obtain specifications and availability of identified components 1.6. Develop plans, with prioritised tasks and contingency arrangements, for installation of components with minimum disruption to ***client*** 1.7. Liaise with ***appropriate person*** to obtain approval for the plans, including security clearance and timing
2. Install and configure an IP network	2.1. Install and configure server ***hardware*** and ***software*** according to organisational and industry ***standards***, following plans 2.2. Install and configure ***computer***, other hardware and software according to organisational and industry standards and plans 2.3. Install and configure other software required for the network to operate with security and integrity according to the plan
3. Test and reconfigure the IP network	3.1. Test the installed software and hardware, utilising available ***technical tools***, to ensure that all components are functioning as expected 3.2. Test the network to ensure it is functioning according to specifications 3.3. Resolve problems identified in the modified network
4. Complete documentation and clean up worksite	4.1. Complete hardware and asset recording document in line with ***organisational requirements*** 4.2. Document installation, boot-up and configuration procedures according to organisational requirements 4.3. Tabulate test results and complete all user reports 4.4. Complete client report and notify of status of the network

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ELEMENT	PERFORMANCE CRITERIA
	4.5. Clean up and restore worksite to client's satisfaction 4.6. Secure sign-off from appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• communication skills to liaise with internal and external personnel on technical, operational and business related matters • literacy skills to interpret technical documentation and write reports in required formats • numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of network • planning and organisational skills to plan, prioritise and monitor own work and coordinate the process in liaison with others • problem solving and contingency management skills to adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments • research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels • technical skills to select and use router test software and hardware to suit different network applications
Required knowledge
• client business domain, business function and organisation • current industry-accepted hardware and software products • data and voice transmission technologies and protocols • networking technologies incorporating substantial depth in some areas • router-based network architectures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and prepare for the IP network installation task • select network elements to meet the client business specifications • install, configure and test the network elements to ensure interoperability within the network • apply network topologies, protocols and security issues • apply solutions to defined network problems.
Context of and specific resources for assessment	Assessment must ensure: • site where network installation may be conducted • use of field measurement equipment currently used in industry • network design documentation • equipment specifications • network components • hardware and software • live network • organisational guidelines • networked (LAN) computers • WAN service point of presence.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing, configuring and testing a new or updated network • evaluation of report prepared by the candidate outlining testing procedures, test results, recommendation to network changes and completion records • oral or written questioning of required knowledge.
Guidance information for	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended,

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EVIDENCE GUIDE	
assessment	for example: • ICTTEN4199A Install, configure and test a router • ICTTEN5201A Install, configure and test a server. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Network may include:	• data • internet • internet protocol private branch exchange (IP

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RANGE STATEMENT	
	PBX) • IPTV • large and small local area networks (LAN) • national wide area networks (WAN) • radio frequency identification (RFID) • storage area network (SAN) • voice • voice over internet protocol (VoIP) • virtual private network (VPN).
Documentation may include:	• audit trails • client training • equipment inventory • ISO, IEC, AS standards • naming standards • project management templates and report writing • satisfaction reports • version control.
Components may include:	• CD, DVD and Blu-ray drives • central processing unit (CPU) • complementary metal oxide semiconductor (CMOS) battery • central processing unit (CPU) upgrades • fax and modem cards • hard drives (internal and external) • hardware • interface cards • motherboards • RAM upgrades • software • wireless adaptors.
Network elements may include:	• adaptors • communications cables and connectors • hubs • routers • servers • switches.
Requirements may refer to:	• application • business • network

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RANGE STATEMENT	
	• people in the organisation • system.
Client may include:	• external organisations • individuals • internal departments • Internal employees.
Appropriate person may include:	• authorised business representative • client • supervisor.

Hardware may include but is not limited to:	• cables:
	  • Category 5e, 6, or 7
	  • crossover
	  • fibre
	  • shielded twisted pairs (STP)
	  • straight through
	  • unshielded twisted pairs (UTP)
	• digital subscriber line (DSL) modems
	• modems and other connectivity devices
	• network elements
	• personal computers
	• remote sites
	• workstations.

Software may include:	• commercial software applications • in-house or customised software • open software • organisation-specific software • packaged software.
Standards may include:	• ISO, IEC, IEEE, IETF, ITU, AS standards • organisational standards • project standards.
Computer may include:	• laptops • mobile equipment • netbooks • other devices • servers • smart phones • workstations.
Technical tools may include:	• diagnostic software • hyperterminal

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RANGE STATEMENT	
	• LAN Cat tester.
Organisational requirements may include:	• preventative maintenance and diagnostic policy • problem solution processes • roles and technical responsibilities in the network management • vendor and product service level support agreements • work environment.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4199A Install, configure and test a router

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake router installation and configuration as part of the upgrade in an existing network or the implementation of a new network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. They would be employed by telecommunications companies and IT networking provisioning companies. They will gain knowledge of routing protocols and routing diagnostics required for integrating new and converging functionalities to the network.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to install a router	1.1. Prepare for given work according to relevant legislation, occupational health and safety (OHS), codes, regulations and standards 1.2. Arrange access to the site according to required procedure 1.3. Ascertain ***network*** topology from technical requirements 1.4. Determine the internet protocol (IP) addressing scheme for the network topology 1.5. Evaluate network management and security ***requirements***, with reference to current and future requirements 1.6. Select a ***router*** with appropriate features according to technical requirements 1.7. Choose ***cables***, wireless application protocol (WAP), wide area network (WAN) connectors and other ***peripherals*** according to network and router specification, and ***WAN protocols***
2. Install and configure a router	2.1. Assemble router and peripherals according to manufacturer's requirements, enterprise guidelines and ***protocols*** 2.2. Connect communications cables and WAN connectors to the router and to the network 2.3. Configure router according to manufacturer's instructions and technical requirements, taking into account interoperability requirements with network components
3. Test the router and reconfigure the network	3.1. Test the router for connectivity across the network and for ***routing protocol*** functions 3.2. Adapt or modify the predetermined router configuration, depending on outcome of tests 3.3. Review router in line with organisational requirements 3.4. Test router and peripherals according to manufacturer's instructions and technical requirements 3.5. Test ***hardware*** and router to ensure full functionality and interoperability 3.6. Reconfigure additional hardware as required 3.7. Make adjustments to network depending on test

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ELEMENT	PERFORMANCE CRITERIA
	results
4. Complete documentation and clean up worksite	4.1. Tabulate test results and complete all user reports 4.2. Complete report and notify client of status of the network 4.3. Clean up and restore worksite to client's satisfaction 4.4. Secure sign off from ***appropriate person***

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• communication skills to liaise with internal and external personnel on technical, operational and business related matters • literacy skills to interpret technical documentation and write reports in required formats • numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of network • planning and organisational skills to plan, prioritise and monitor own work and coordinate the process in liaison with others • problem solving and contingency management skills to adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments • research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels • technical skills to select and use router test software and hardware to suit different network applications
Required knowledge

• Australian Computer Society Code of Ethics
• effect of a router on delimiting broadcast traffic and on conserving bandwidth
• how dynamic routing algorithms or protocols create and maintain routing tables
• providing the network with redundant paths for reliability and the way routers manage these paths
• router:
  • basic router commands
  • configuration:

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REQUIRED SKILLS AND KNOWLEDGE
◦ clock rate ◦ password protection of router ◦ routing protocol • dynamic routing • firewalls • functions • routing protocols and how they operate • tables • router-based network architectures • use of routing tables in intelligent packet routing and switching

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and prepare for the router installation task • select a router to meet the client business specifications • install and test the router that ensures interoperability within the network and applying router principles and technologies • report on the status of the completed installation and seek sign off and customer satisfaction • use routers • apply solutions to defined routing problems.
Context of and specific resources for assessment	Assessment must ensure: • site where router installation may be conducted • use of field measurement equipment currently used in industry • relevant router specifications • technical requirements for a network • router • cabling • networked (LAN) computers • WAN service point of presence • relevant equipment and organisational documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing, configuring and testing a router • oral or written questioning of underpinning skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, results, recommendations to network changes and

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EVIDENCE GUIDE	
	completion records.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4198A Install, configure and test an internet protocol network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Network may include:	• data • internet • internet protocol private branch exchange (IP PBX) • internet protocol TV (IPTV) • large and small LANs • national WANs • radio frequency identification (RFID) • storage area network (SAN) • voice • voice over internet protocol (VoIP) • virtual private network (VPN).
Requirements may be in reference to:	• application • business • network • employees in the organisation • system.
Router may include:	• 3Com OfficeConnect Remote 810 ADSL • 3Com SuperStack 400 • Cisco 800 and ISR Series routers • Cisco uBR7200 universal broadband routers • Cisco wireless access points • D-Link routers • Intel Express series • Juniper routers • Linksys routers • Motorola Vanguard series • Netopia routers.
Cables may include:	• Category 5e, 6 or 7 • crossover • fibre • shielded twisted pair (STP) • straight through • unshielded twisted pair (UTP).

Peripherals may include:	• Bluetooth devices
	• fax
	• Firewire (IEEE 1394)
	• input equipment:
	  • keyboard
	  • mouse

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RANGE STATEMENT	
	• pens • touch pad • laptops and desktop computers • mobile phones • modems • multimedia kits • palmtops and personal digital assistants (PDAs) • personal computer • printers • scanners • speakers • tape cartridges • universal serial bus (USB).
WAN protocols may include:	• advanced data communications protocol (ADCP) • binary synchronous control (BSC) • high-level data link control (HDLC) • point to point protocol (PPP) • synchronous data link control (SDLC) • transmission of IP datagrams over X.25, Frame Relay or ATM.

Protocols may include:	• AppleTalk protocol - Phase 2 (1989)
	• dynamic host configuration protocol (DHCP)
	• novell protocol suite:
	  • internetwork packet exchange (IPX)
	  • NetBIOS emulator
	  • netware core protocol
	  • sequenced packet exchange (SPX)
	• TCP/IP:
	  • internet control message protocol (ICMP) see router protocols above
	  • Net BT
	• WAN protocols (encapsulations):
	  • advanced data communications protocol (ADCP)
	  • binary synchronous control (BSC)
	  • high-level data link control (HDLC)
	  • point-to-point protocol (PPP)
	  • synchronous data link control (SDLC).

Routing protocol may include:	• Cisco discovery protocol (CDP) • dynamic routing

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RANGE STATEMENT	
	• enhanced interior gateway routing protocol (EIGRP) • exterior gateway protocol and border gateway protocol (superseded by BGP) • netWare link state protocol (NLSP) • open shortest-path first interior gateway protocol (OSPF) • routing information protocol (RIP) • static routing.
Hardware may include:	• DSL modems • modems and other connectivity devices • networks • personal computers • remote sites • servers • workstations.
Appropriate person may include:	• authorised business representative • client • supervisor.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4202A Install and test a radio frequency identification system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake a radio frequency identification (RFID) installation, configuration and testing. This could be part of the upgrade in an existing or the implementation of a new logistical or security network using RFID technology. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers in field work who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. They would be employed by telecommunications and IT networking provisioning companies specialising in RFID technology. They will be able to use acquired knowledge of integrating new and converging functionalities to a network.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to install specified RFID system	1.1. Prepare for given work according to relevant legislation, occupational health and safety (OHS), codes, regulations and standards 1.2. Arrange access to the site according to required procedure 1.3. Choose the most suitable ***RFID system*** based on ***specifications*** and in consultation with ***appropriate person*** 1.4. Evaluate options for equipment installation siting and antenna positioning to include the effects of electromagnetic interference and shielding 1.5. Investigate causes of interference with RFID systems 1.6. Specify the ***network element requirements*** for the installation and any ***training requirements*** for ***clients*** 1.7. Create a deployment plan including down times and advise the ***user group*** 1.8. Obtain all components and devices required for the RFID system
2. Install specified RFID system and resolve any faults	2.1. Install interrogators or readers according to given plan 2.2. Install tags and document the correct procedures for locating and orienting tags 2.3. Install and undertake network ***configuration*** activities using relevant operating system and application upgrades to integrate RFID system into the overall network 2.4. Troubleshoot problems between interrogators or readers, tags and networks including tuning for ***optimum performance*** and rectify any faults
3. Test the RFID installation according to specification and standards	3.1. Test system installation according to design specifications and standards including optimum placement of tags and data transmission completeness and record outcomes 3.2. Carry out any changes 3.3. Validate changes or additions against specifications 3.4. Document the test results
4. Complete documentation in	4.1. Complete all ***documentation*** for users according to the design and customer requirements

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ELEMENT	PERFORMANCE CRITERIA
compliance with customer requirements and clean up worksite	4.2. Complete report and notify client of status of the network and standards applying to the installation 4.3. Clean up and restore worksite to client's satisfaction 4.4. Secure sign off from appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• communication skills to liaise with internal and external personnel on technical, operational and business related matters • literacy skills to interpret technical documentation and write reports, user and training documentation in required formats • numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of RFID system • planning and organisational skills to plan, prioritise and monitor own work • problem solving and contingency management skills to adapt configuration procedures to requirements of RFID network and reconfigure depending on differing operational contingencies, risk situations and environments • research skills to interrogate vendor databases and website to implement different configuration requirements to meet client design specifications • technical skills to select and use RFID diagnostic test, application software and hardware to suit different RFID network applications
Required knowledge
• client business domain, business function and organisation • common network cable types and connectors • compatibility issues and resolution procedures • configuration of internet protocol (IP) networks • current industry-accepted hardware and software products • desktop applications and operating systems as required • enterprise communication and training systems in relation to training and advising staff involved in the deployment • network topologies • RFID technologies incorporating substantial depth in network operating systems, protocols, interrogators and sensors, wireless technologies and cabling standards

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan installation • use basic research skills for adapting RFID technologies to specified plan and design • implement and verify RFID operations • implement RFID architecture across a secure environment • encode RFID tags and attach to items • integrate RFID information into business applications • configure the network with IP addressing • cable and test the RFID network • create technical and user documentation.
Context of and specific resources for assessment	Assessment must ensure: • site where RFID installation may be conducted • use of field measurement equipment currently used in industry • relevant network element specifications • technical requirements for an RFID network • cabling • networked (LAN) computers • workstations • RFID diagnostic software • WAN service point of presence.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing and testing an RFID system • oral or written questioning of underpinning skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, test results and recommendation of network changes.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4198A Install, configure and test an internet protocol network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
RFID system may include:	• antenna • cabling • databases • interrogators or readers • power supplies • tags • wireless units.

Specifications may include:	• cable drops
	• device mounting locations
	• electrical specifications for:
	  • adapters
	  • interrogators
	  • power units
	  • readers
	  • sensors
	  • tags
	  • wireless units
	• interrogation zone locations
	• RFID network topology
	• site diagrams.

Appropriate person may include:	• authorised business representative • client • IT support manager • network administrator • RFID network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
Network element requirements may include:	• drives • routers • servers • switches.
Training requirements relate to:	• education requirements for support staff • client requirements • relevant enterprise policies.
Clients may include:	• external organisations • individual people • internal departments • internal employees

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RANGE STATEMENT	
	• logistic company • warehouse.
User group may include:	• administration • dispatch • inventory • stores • transport • warehouse.
Configuration may include:	• access control needs • hostnames • IP addresses • network connectivity issues • port numbers • server domains.

Optimum performance may include:	• antenna type
	• cable length or loss
	• equipment mounting and protection
	• interference considerations
	• latency
	• tag type
	  • active
	  • operating frequency
	  • passive.

Documentation may include:	• audit trails • ISO, IEC, AS standards • naming standards • operational instructions • project management templates • report writing • training documentations • version control.

Unit Sector(s)

Unit sector	Telecommunications

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4210A Implement and troubleshoot enterprise routers and switches

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to implement and troubleshoot routers and switches. It involves configuring and programming routers and switches to establish voice and data services and applications over local area networks (LAN) and wide area networks (WAN) connections for enterprise networks. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to medium to large enterprises requiring the use of internetwork services and applications. It also applies to networks employing virtual LAN (VLAN) connectivity and hierarchical addressing schemes and where access control will be used to achieve network security. Relevant job roles include installer of IP networks, enterprise network technician, network administrator and network support.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for implementation of network routers and switches	1.1. Prepare for given work according to occupational helath and safety (***OHS***) and ***environmental requirements*** with ***appropriate personnel*** 1.2. Identify safety hazards and implement risk control measures in consultation with appropriate personnel 1.3. Determine nature and scope of the network routers and network switches and ***network resources*** from job briefs or appropriate personnel 1.4. Select and obtain network services and network application requirements according to ***enterprise procedures*** 1.5. Obtain identified operating instructions, manuals, hardware and software testing methodologies 1.6. Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Implement network switches and routers	2.1. Configure routers and switches according to manufacturer's specifications and enterprise procedures 2.2. Determine ***network addressing scheme*** for network connectivity and verify using ***calculations*** 2.3. Activate and verify network WAN links to provide network connectivity 2.4. Enable ***network services*** and ***network applications*** to the network to complete network connectivity process 2.5. Set up traffic access and filtering according to enterprise procedures
3. Troubleshoot network switches and routers	3.1. Monitor network performance and isolate faults using diagnostic and analysis tools 3.2. Troubleshoot network and internet connectivity according to manufacturer's specifications and enterprise procedures
4. Document configuration and troubleshooting records	4.1. Restore work site to safe condition according to established safety procedures 4.2. Record and store ***essential implementation information*** according to enterprise procedures 4.3. Notify appropriate personnel about the completion of the task according to enterprise procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with technical staff
- literacy skills to read and interpret enterprise procedures, manuals and specifications
- numeracy skills to interpret technical data and perform calculations
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
  - deal with unexpected situations on the basis of safety and specified work outcomes
  - troubleshoot common network problems
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - follow enterprise OHS procedures
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to :
  - configure and activate network access and security measures
  - configure switches and routers to enable LAN and WAN links
  - connect enterprise networks using WAN services and applications
  - connect the enterprise network to external services
  - maintain enterprise network documentation
  - troubleshoot network faults and implement recovery action
  - use a hierarchical internet protocol (IP) network address scheme
  - use tools and equipment to analyse enterprise network

Required knowledge

- access control lists
- correct use of tools and equipment
- enterprise:
  - features and applications
  - OHS procedures
  - record keeping procedures
  - switching and routing protocols and strategies:

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REQUIRED SKILLS AND KNOWLEDGE
• hierarchical addressing • multilayer switching • routing protocols • VLAN routing • implement enterprise WAN links • network diagnostic and troubleshooting techniques • network modelling

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • determine customer networking requirements • configure routers and switches using hierarchical addressing over VLANs to meet network link requirements • enable and control access to network services and applications across the network • diagnose and rectify network hardware and device configuration faults • document configuration information, fault-finding history and remediation action.
Context of, and specific resources for assessment	Assessment must ensure: • a network facility and workstations • operating instructions, installation documents and manuals • hardware and software testing tools currently used in industry.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing and troubleshooting routers and switches • review documentation of implementation and troubleshooting prepared by the candidate • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN2207A Install and configure a home or small office network • ICTTEN2208A Install and configure a small to medium business network

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EVIDENCE GUIDE	
	• ICTTEN2209A Build and maintain a secure network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OHS may include:	• awards provisions • hazardous substances and dangerous goods codes • legislation • local safe operation procedures

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RANGE STATEMENT	
	• material safety management systems • protective equipment.
Environmental requirements may include:	• dust • excessive energy and water use • excessive noise • fumes • gas • liquid waste • smoke emissions • solid waste • vapour.
Appropriate personnel may include:	• customer • manager • network manager • site engineer • supervisor.
Network resources may include:	• domain name system (DNS) server • dynamic host configuration protocol (DHCP) server • files • software • web browser.

Enterprise procedures may include:	• instructions:
	  • designs
	  • drawings
	  • job sheets
	  • plans
	• manufacturer's specifications
	• operational procedures
	• reporting and communication
	• use of tools and equipment.

Network addressing scheme may include:	• dynamic • static • subnet.
Calculations may include:	• binary addition • binary conversion • binary division • binary multiplication • binary number system

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RANGE STATEMENT	
	• binary subtraction.
Network services may include:	• authentication servers • collaborative services • DHCP • directory services • DNS • email • network file system • printing • web services.
Network applications may include:	• media player • spreadsheet • word-processor.
Essential implementation information may include:	• fault history • installation software • IP addressing schemes • logical and physical diagrams • network administrator codes • network recovery actions • passwords • router configuration details • security access codes • switch configuration details.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4211A Design, install and configure an internetwork

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design, install and configure an enterprise local area network (LAN) and wide area network (WAN) internetwork. It involves testing and troubleshooting an internetwork. The design involves determining network requirements and topology selection for wired and wireless infrastructure. Advanced routing and addressing schemes are also used in the design. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to the design, installation and configuration of cable and wireless networks suitable for large, medium and small office home office (SOHO) enterprises. Relevant job roles include designer and installer of IP networks, enterprise internetwork technician, network administrator and network support.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for the design and installation of an internetwork	1.1. Prepare for given work according to occupational health and safety (***OHS***) and ***environmental requirements*** with ***appropriate personnel*** 1.2. Identify safety hazards and implement risk control measures in consultation with appropriate personnel 1.3. Determine nature and scope of the ***internetwork*** from job briefs and appropriate personnel 1.4. Obtain operating instructions, manuals, hardware and software testing methodologies 1.5. Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Design an enterprise internetwork	2.1. Produce enterprise ***internetwork topology*** after considering technical requirements, physical and financial constraints and expansion projections 2.2. Determine ***network devices*** and ***network resources*** according to enterprise procedures 2.3. Produce the internetwork design including network security and router and switch configurations to meet design specifications and ***enterprise procedures***
3. Install and configure a designed internetwork	3.1. Install network hardware to network topology design plan according to enterprise procedures 3.2. Determine ***network addressing scheme*** for network connectivity and verify using ***calculations*** 3.3. Configure routers and switches to perform the logical connection of the internetwork 3.4. Conduct connectivity and performance tests to verify the network installation meets the design specification 3.5. Troubleshoot internetwork and internet connectivity according to manufacturer's specifications and enterprise procedures
4. Complete and document network design and installation	4.1. Restore worksite to safe condition according to established safety procedures 4.2. Record and store ***essential design and installation information*** according to enterprise procedures 4.3. Notify appropriate personnel about the completion of the task according to enterprise procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise and negotiate with customers and peers to achieve design specifications
- literacy skills to:
  - develop network documentation and maintain network records
  - read and interpret enterprise procedures, manuals and specifications
- numeracy skills to interpret technical data
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
  - deal with unexpected situations on the basis of safety and specified work outcomes
  - troubleshoot common network problems according to help desk procedures
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - follow enterprise OHS procedures
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - analyse the impact of applications on traffic flow in the network
  - apply network design methodologies to design networks that provide a range of services and applications found in larger networks
  - conduct a wireless site survey
  - determine customer requirements and a design specification
  - determine the impact of upgrading hardware and software on network functionality
  - identify the technical requirements, constraints and manageability issues for a given customer network requirement
  - install a network design
  - use tools and equipment

Required knowledge

- enterprise OHS procedures
- open systems interconnect (OSI) layered communication model
- network requirements:
  - applications

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REQUIRED SKILLS AND KNOWLEDGE
• lifecycle • manageability • quality of service • network design concepts: • business requirements • network topologies • physical and financial constraints • security • wired or wireless options • tool and equipment use • troubleshooting: • impact of network failure • maintenance • troubleshooting methodology

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • determine customer requirements • design an internetwork that uses advanced routing and addressing techniques • install an internetwork according to design specification • configure network devices to meet design functionality • document internetwork design, installation and configuration.
Context of, and specific resources for assessment	Assessment must ensure: • a site where design and installation of an internetwork network may be conducted • use of tools, equipment and materials currently used in industry • relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate designing, installing and configuring an internetwork • review of documents prepared by the candidate detailing design and installation • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN2207A Install and configure a home or small office network • ICTTEN2208A Install and configure a small to

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EVIDENCE GUIDE	
	medium business network • ICTTEN4210A Implement and troubleshoot enterprise routers and switches. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OHS may include:	• awards provisions • hazardous substances and dangerous goods codes

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RANGE STATEMENT	
	• legislation • local safe operation procedures • material safety management systems • protective equipment.
Environmental requirements may include:	• dust • excessive energy and water use • excessive noise • fume • gas • liquid waste • smoke emissions • solid waste • vapour.
Appropriate personnel may include:	• customer • manager • network manager • site engineer • supervisor.
Internetwork may refer to:	• connection of two or more distinct computer networks or network segments via a common routing technology • LAN • WAN.

Internetwork topology may refer to:	• physical and logical interconnection between network devices:
	  • bus
	  • mesh
	  • ring
	  • star
	  • tree.

Network devices may include:	• cable and wireless:
	  • router
	  • server
	  • switch.

Network resources may include:	• files • printers • software.
Enterprise procedures may	• instructions: • designs

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RANGE STATEMENT	
include:	• drawings • job sheets • plans • manufacturer's specifications • operational procedures • reporting and communication • use of tools and equipment.
Network addressing scheme may include:	• dynamic • static • subnet.
Calculations may include:	• binary addition • binary conversion • binary division • binary multiplication • binary number system • binary subtraction.
Essential design and installation information may include:	• configuration • design • installation • installation software • IP addressing schemes • logical and physical diagrams • network administrator codes • passwords • security access codes • troubleshooting reports.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units	

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Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN4213A Configure and troubleshoot advanced network switching

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to perform network switch configuration and troubleshooting, including network management by remote access for wired and wireless networks. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to large networks involving wireless local area networks (WLANs), virtual local area networks (VLANs), interVLAN routing, remote access management and operating system management of network devices. Relevant job roles include installer of internet protocol (IP) enterprise networks, enterprise network technician, network administrator and network support.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to work on a switched network	1.1. Prepare for given work according to occupational health and safety (***OHS***) and ***environmental requirements*** with ***appropriate personnel*** 1.2. Identify safety hazards and implement risk control measures in consultation with appropriate personnel 1.3. Determine nature and scope of the network and network topology from job briefs or appropriate personnel 1.4. Select and obtain wireless and wired network components requirements according to ***enterprise procedures*** 1.5. Obtain operating instructions, manuals, hardware and software testing methodologies 1.6. Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Configure network switches	2.1. Set up and configure network switches according to manufacturer's specifications and enterprise procedures 2.2. Build and configure a routed network using remote access management 2.3. Establish multiple VLANs across the network to manage the access and traffic across the network
3. Troubleshoot network	3.1. Monitor network traffic and assess performance against manufacturer's specifications and established procedures 3.2. Troubleshoot network according to manufacturer's specifications and enterprise procedures 3.3. Identify and rectify faults according to enterprise procedures
4. Complete and document network installation and configuration	4.1. Restore worksite to safe condition according to established safety procedures 4.2. Record and store ***essential configuration information*** according to enterprise procedures 4.3. Notify appropriate personnel about the completion of the task according to enterprise procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customers and peers to achieve outcomes
- literacy skills to read and interpret enterprise procedures, manuals and specifications
- numeracy skills to interpret technical data
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
  - deal with unexpected situations on the basis of safety and specified work outcomes
  - troubleshoot network malfunctions
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - follow enterprise OHS procedures
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - configure a network to support multiple VLANS
  - configure a switch using VLAN trunking and spanning tree protocols
  - design and build a interVLAN switched network
  - establish LAN switching over a wireless network
  - install switch and remote access security
  - use tools and equipment

Required knowledge

- enterprise OHS procedures
- interVLAN routing
- spanning tree protocol
- switch and remote network security management
- tool and equipment correct usage
- troubleshooting procedures
- VLAN trunking protocol
- wireless LAN setup and access configuration

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • build and configure a routed network • configure a VLAN on a given network topology • configure VLAN trunking and spanning tree protocols • establish VLANs over a wireless network • design and deploy remote access and network security.
Context of, and specific resources for assessment	Assessment must ensure: • a site where configuring advanced network switching may be conducted • use of tools, equipment and materials currently used in industry • relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate performing network switch configuration • direct observation of the candidate troubleshooting network problems • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN2209A Build and maintain a secure network • ICTTEN4212A Apply advanced routing protocols to network design • ICTTEN4214A Install and maintain a wide area network.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OHS may include:	• awards provisions • hazardous substances and dangerous goods codes • legislation • local safe operation procedures • material safety management systems

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RANGE STATEMENT	
	• protective equipment.
Environmental requirements may include:	• dust • excessive energy and water use • excessive noise • fume • gas • liquid waste • smoke and fugitive emissions • solid waste • vapour.
Appropriate personnel may include:	• customer • manager • network manager • site engineer • supervisor.

Enterprise procedures may include:	• instructions:
	  • designs
	  • drawings
	  • job sheets
	  • plans
	• manufacturer's specifications
	• operational procedures
	• reporting and communication
	• use of tools and equipment.

Essential configuration information may include:	• installation software • installation and configuration documentation • IP addressing schemes • logical and physical diagrams • network administrator codes • passwords • security access codes • troubleshooting reports.

Unit Sector(s)

Unit sector	Telecommunications

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5024A Provide consultancy and technical support in the customer premises equipment sector

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes skills and knowledge required to provide consultancy to a client wishing to install or upgrade telecommunications equipment on their premises. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technicians involved in planning and consultancy with organisations deploying converging technologies integrating data, wireless, optical and internet protocol (IP) networks apply the skills and knowledge in this unit. This unit applies to installation of cabling and equipment within customer premises in domestic, commercial or industrial installations. Communications applications include digital and analog, telephony, data, video, digital broadcasting, computer networks, local area networks (LAN), wide area networks (WAN), and multimedia.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to provide consultancy and technical support in the CPE sector	1.1. Obtain consultancy requirements from the client 1.2. Establish relationship with ***industry*** experts to maintain currency of latest industry innovations in the customer premises equipment (CPE) sector 1.3. Access sources of ***product and technical information*** relating to change and innovation 1.4. Access and evaluate latest data relating to change and innovation in the CPE sector for company use within an appropriate timeframe
2. Assess customer needs	2.1. Develop knowledge and understanding of the client's business to provide an accurate solution according to the requirements 2.2. Investigate communication requirements including ***networks***, based on business needs and demands 2.3. Ascertain client's ***physical and financial parameters*** 2.4. Present reports and recommendations within client's timeframes
3. Provide consultancy and expert advice	3.1. Provide timely and accurate expert ***consultancy*** and advice to ***company staff and clients*** 3.2. Provide communication solutions that meet client's requirements and that meet ***relevant legislation***, ***codes***, ***regulations and standards*** 3.3. Provide alternative solutions for clients where their needs cannot be better met in an innovative way 3.4. Provide a report on advice and solutions that match both the physical and financial demands of the client 3.5. Consult with the client for an ***agreed solution***
4. Control and manage product and technical information	4.1. Provide all relevant personnel with the latest product and technical information 4.2. Monitor the information flow process to ensure that appropriate personnel have access to the latest data 4.3. Provide the client with final consultancy reports and recommendations

Required Skills and Knowledge

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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customers to ensure requirements are known and can be met within timeframes
- literacy skills to interpret technical specifications and related documentation
- numeracy skills to make calculations for dimensioning, cost and financial considerations
- planning and organisation skills to make site access arrangements and plan and prioritise own work
- problem solving skills to develop communications solutions
- research skills to gain and maintain relevant and current technical product knowledge
- technical skills to:
  - interpret drawings related to customer's telecommunications equipment
  - provide expert advice on installation and upgrade
  - use databases and diagnostic equipment

Required knowledge

- common customer telecommunications applications and related equipment
- connections to carrier infrastructure or equipment
- current legislation relating to installation of telecommunications equipment and connection to carrier services
- enterprise operations and policies
- IP networks
- new and emerging technologies
- overview knowledge of customer premise equipment

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• provide consultancy advice related to full range of CPE products including:
	  • product models and equipment types
	  • peripherals
	  • facilities including network facilities
	  • system features
	• provide alternative solutions where customer's needs cannot be met precisely
	• prepare clear and concise reports to customers complete with recommendations and supporting data, including full financial considerations
	• provide regular updates to both company personnel and clients as to the latest product and technical information.

Context of and specific resources for assessment	Assessment must ensure:
	• site with:
	  • network or computer layout documentation and premises plans
	  • network components
	  • equipment specifications
	  • organisational guidelines
	  • business plan or model
	• relevant legislation.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate undertaking a practical exercise • review of reports completed by the candidate for different test examples and situations • oral or written questioning to assess knowledge of planning, types of systems and applications.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN5204A Produce technical solutions from business specifications. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Industry may include:	• communications • information technology • multimedia industries.

Product and technical information relates to:	• CPE product
	• facilities including:
	  • network facilities
	  • system features
	• peripherals
	• product models and equipment types.

Networks may be:	• external • internal • in Australia • overseas.

Physical and financial parameters may include:	• physical parameters:
	  • building size
	  • equipment inventory
	  • new equipment requirement
	  • power requirements
	  • site access
	  • size of organisation
	  • staffing
	• financial parameters:
	  • capital expenditure
	  • current budget allocation
	  • current return on investment
	  • forecast fund allocation
	  • future return on investment
	  • operational costs.

Consultancy may be:	• direct to a customer • through a third party considering provision of consultant's company product • supported by explanatory documentation.
Company staff and clients may include:	• own or partner company staff • sales and technical staff.
Relevant legislation, codes, regulations and standards include:	• Australian Communications Industry Forum (ACIF) standards and codes • Australian Communications and Media Authority (ACMA) technical standards

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RANGE STATEMENT	
	• AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • Australian building codes and regulations • Australian Standards AS 3901, 3902 • fire regulations • heritage legislation • International Standards ISO 9000, 9001 • OHS • Trade Practices Legislation.
Agreed solution includes:	• cost details • equipment requirements • procurements information • recommended vendors • return on investment (RoI) information.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5168A Design and implement an enterprise voice over internet protocol and a unified communications network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design and implement the infrastructure for enterprise voice over internet protocol (VoIP) and unified communications (UC) systems to meet business requirements using converging network technologies. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Telecommunications or IT technicians with significant technical expertise apply the skills and knowledge in this unit. They combine technical expertise with a range of analytical, research and planning skills to develop and tailor IP convergence solutions for particular business needs. This unit applies to individuals working to design and implement the infrastructure to enable enterprises to use VoIP and other packet-based services. It also applies to enterprises outlaying capital looking for return on investment by reducing operating costs and improved unified internet protocol (IP) based communication systems.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and design VoIP infrastructure to meet business requirements	1.1. Ascertain ***end-user requirements*** in consultation with client 1.2. Select VoIP infrastructure in line with business and end-user requirements, within budget limitations 1.3. Select ***protocols for converged networks*** 1.4. Select ***hardware***, ***software***, ***network*** and security ***requirements*** according to agreed business and end-user specifications 1.5. Investigate ***factors*** affecting bandwidth and calculate bandwidth usage for various codecs, including considerations of overhead, connection quality and connection speeds
2. Install and configure VoIP infrastructure to meet business requirements	2.1. Implement telephone number mapping (ENUM), number portability, end point addressing, path selection, calling classes and overlapping number ranges 2.2. Install, configure and test ***gatekeepers*** 2.3. Install and test ***convergent terminal equipment*** and software 2.4. Install software and configure and test VoIP services 2.5. Configure security access levels to safeguard data, making use of appropriate tools
3. Configure a UC network	3.1. Obtain the topology and components of a UC network 3.2. Analyse the potential of IP multimedia subsystem (IMS) network architecture to enable the convergence of voice, video and data applications and various mobile network technologies over IP based layer 3.3. Incorporate the use of a communications server to provide ***real-time multimedia communications*** 3.4. Select common videoconferencing codecs according to standards and practices 3.5. Select ***voice and video conferencing hardware*** 3.6. Implement IP-private branch exchange (PBX) functionalities in the UC network
4. Test and evaluate the performance of convergent networks	4.1. Develop possible ***network congestion solutions*** for common network congestions to meet quality of service (QoS) specified 4.2. Provide solutions for problems in contacting

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ELEMENT	PERFORMANCE CRITERIA
	emergency services 4.3. Analyse network traffic and resolve problems using packet sniffer, monitoring software and hardware solutions 4.4. Troubleshoot convergent communications over wireless networks 4.5. Analyse types and effects of ***attacks***, including ***man-in-the-middle attacks*** 4.6. Plan ways to counteract denial of service (DoS) and distributed DoS (DDoS) attacks 4.7. Predict the impact of virtual local area network (VLAN) hopping, media access control (MAC) address movements, additions and changes on network
5. Test and verify the security access levels	5.1. Analyse types of intrusion detection 5.2. Monitor and evaluate capability and reliability of security systems 5.3. Make system alterations to ensure protection against known and potential threats 5.4. Verify and test that user settings conform to security policies 5.5. Backup, upgrade and scan systems to minimise attacks
6. Complete documentation and sign off procedures	6.1. Complete required records and notify customer 6.2. Remove installation waste and debris from worksite and dispose of according to environmental requirements to maintain safe worksite conditions 6.3. Reinstate site according to customer and company requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analytical skills to evaluate network traffic protocols and bandwidth considerations • communications skills to liaise with clients and determine business requirements

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REQUIRED SKILLS AND KNOWLEDGE

• planning and organisational skills to plan, design and implement VoIP infrastructure
• project planning skills in relation to setting benchmarks and identifying scope
• problem solving skills in a predictable range of network problems
• research skills for identifying, analysing and evaluating broad features of a particular business domain and best practice in networking technologies
• technical skills to :
  • compare session initiation protocol (SIP), H323 and media gateway control protocol (MGCP) or media gateway control (Megaco)
  • configure a VoIP and a UC network and assess the performance of convergent networks and test and verify security access levels
  • define latency, jitter and wander and implement methods for reducing or eliminating them using jitter buffer, QoS, traffic shaping and VLANs
  • describe the format of a SIP uniform resource identifier (URI)
  • evaluate and implement SIP trunking to connect enterprise internet protocol (IP)-based communications systems over long distances
  • identify common G.7xx codes and describe the impact of compression on voice quality
  • identify the components of SIP
  • identify the functions of signalling protocols for converged networks

Required knowledge

• broad knowledge of:
  • client business domain, business function and organisation
  • current and emerging industry accepted hardware and software products
  • current and emerging transmission technologies and protocols
  • networking technologies

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • design and implement the infrastructure for enterprise VoIP and UC systems to meet business requirements using converged networks • apply knowledge of current networking, transmission technologies and protocols • evaluate network traffic protocols and bandwidth considerations • configure a UC network • assess the performance of convergent networks • test and verify security access levels.
Context of and specific resources for assessment	Assessment must ensure: • live network • networked computers • network design documentation • equipment specifications • network components.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of report prepared by the candidate outlining design process undertaken, including challenges faced and how these were addressed • direct observation of the candidate installing and configuring VoIP infrastructure and configuring a UC network • evaluation of system designed and implemented by the candidate in terms of performance and suitability of for business needs.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN5201A Install, configure and test a server.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

End-user requirements may include:	• how and what the organisation wants in regard to:
	  • preventative maintenance and diagnostic policy
	  • problem solution processes
	  • return on investment (RoI)

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RANGE STATEMENT	
	• roles and technical responsibilities in the IT department • vendor and product service level support agreements • work environment.
Protocols for converged networks may include:	• H225 • H320 • H323 • H450 • Megaco • MGCP • SIP.
Hardware may include:	• cable or DSL modems • IP phones • modems • multi-layer switches • networks • other connectivity devices • personal computers • remote sites • routers • servers • switches • wireless devices • workstations.
Software may include:	• commercial software applications • communications software • in-house or customised software • networking device operating systems • organisation-specific software • packaged software.
Network may include:	• data and voice • internet • large and small LANs • national wide area networks (WANs) • private lines • use of public switched telephone network (PSTN) for dial-up modems only • virtual private networks (VPNs).

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RANGE STATEMENT	
Requirements may include:	• reference to the business, system, application, network or people in the organisation • simple addition or upgrade to a major new installation.
Factors may include:	• codec choice • compression • latency • packet reordering • protocol incompatibility • QoS issues.
Gatekeepers may include:	• call manager • media gateway • media gateway controller (call agent) • signalling gateway (SG).

Convergent terminal equipment may include:	• analogue telephone adapter (ATA)
	• IP phones
	• single line adapter
	• soft phones:
	  • personal digital assistant (PDA)
	  • wireless fidelity (WiFi).

Real-time multimedia communications may include:	• directory look-up • email • file exchange • instant messaging (IM) • presence • video conferencing.
Voice and video conferencing hardware may include:	• multi-point control unit (MCU) • session border controller (SBC) • set-top box.
Network congestion solutions may include:	• changing configurations • monitoring network traffic and protocols • upgrades.
Attacks may include:	• brute force and dictionary attacks • illicit servers • man-in-the-middle attacks • unsolicited calls • viruses • voicemail compromises.
Man-in-the-middle attacks	• packet sniffing

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RANGE STATEMENT	
include:	• registration hijacking • TP connection hijacking.

Unit Sector(s)

Unit sector	Telecommunications

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5200A Install, configure and test a local area network switch

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake local area network (LAN) switch installation and configuration as part of the upgrade in an existing network or the implementation of a new network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers employed by telecommunications companies and IT networking provisioning companies who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. It involves LAN switch installation, configuration and testing in field work. It also applies to switching protocols and diagnostics required for integrating new and converging functionalities to the network.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to install the network switch	1.1. Prepare for installation in line with site specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures 1.2. Notify customer to arrange access to site 1.3. Document the ***topology*** of the LAN 1.4. Obtain current and future ***network capacity*** predictions according to current and future business requirements from the ***appropriate person*** 1.5. Specify the number and type of ***switch*** required, with reference to future network requirements 1.6. Specify the requirements for network management and security, as prescribed by organisational policy 1.7. Select the switch and switch operating system software version with the appropriate features according to required specifications
2. Install and configure the network switch	2.1. Assemble, rack mount and connect switch and ***peripherals*** according to manufacturer's requirements 2.2. Connect ***user*** to access points using ***cable*** that meets the appropriate ***standard*** 2.3. Establish a valid network connection with other network devices 2.4. Configure a network internet protocol (IP) address for the switch 2.5. Install or configure simple network management protocol (SNMP) agent software, on each switch, to collect network traffic data for the management information base (MIB) from that segment of the network and relay it to the management console 2.6. Install and configure SNMP management console software on a computer designated to be the network manager's main console, to collect network traffic data from the switch acting as agents 2.7. Manually configure the user access ports of the switch for speed and for full or half-duplex operation
3. Test the network switch and reconfigure the network	3.1. Test the switch and other network devices according to manufacturer's requirements and organisational guidelines 3.2. Test to ensure that there is connectivity across the network

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ELEMENT	PERFORMANCE CRITERIA
	3.3. Modify the network to verify SNMP management software 3.4. Make adjustments to the network, depending on test and troubleshooting results
4. Complete documentation and clean up worksite	4.1. Tabulate test results and complete all user reports 4.2. Complete report and notify client of status of the network 4.3. Clean up and restore worksite to client's satisfaction 4.4. Secure sign off from appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels
- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to read and interpret technical documentation and write reports in required formats
- numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of network
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments
- technical skills to:
  - install and configure network switch
  - select switch and switch operating system
  - specify requirements for network management and security
  - test switch and other network devices

Required knowledge

- advantages and disadvantages of switches over hubs
- Australian Computer Society Code of Ethics
- common network cable types and connectors

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REQUIRED SKILLS AND KNOWLEDGE
• common network topologies • differences between standard and intelligent (i.e. configurable) switches and between switches and hubs • documentation skills for networks • implementation and configuration of networks • providing the network with redundant paths for reliability and the way routers and switches manage these paths

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and prepare for the LAN switch installation task • select a LAN Switch to meet the client business specifications • install switches without the network losing connectivity or failing • install and test the switch that ensures interoperability within the network • use a range of switch configurations • apply solutions to a variety of switch-related problems • report on the status of the completed installation and seek sign off and customer satisfaction • use switches • apply solutions to defined switching problems.
Context of and specific resources for assessment	Assessment must ensure: • site where switch installation must be may be conducted • use of field measurement equipment currently used in industry • relevant switch specifications, technical requirements for a network, switch, cabling, networked (LAN) computers, workstations, servers and WAN service point of presence.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing, configuring and testing a LAN switch • oral or written questioning of required skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, results and recommendations to network changes.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4198A Install, configure and test an internet protocol network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Topology may include:	• bus • hierarchical • hybrid • ring • star.

Network capacity may include:	• expandability:
	  • number of available uplink ports
	• hardware reliability
	• LAN topology support:
	  • AppleTalk
	  • Ethernet
	  • FDDI
	  • Token Ring
	• port bandwidth capabilities
	  • 100 megabits per second)
	• redundant power supply (AC/DC).

Appropriate person may include:	• authorised business representative • client • IT support manager • network Administrator • network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
Switch by vendors may include:	• 3Com • Accton • Bay • Cisco • DLink • Intel • NetGear • System 3000 Ethernet.

Peripherals may include:	• Bluetooth devices
	• fax
	• Firewire (IEEE 1394)
	• input equipment may include:
	  • mouse
	  • pens
	  • touch pad

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RANGE STATEMENT	
	• laptops and desktop computers • mobile phones • modems • multimedia kits • palmtops and personal digital assistants (PDAs) • personal computer • printers • scanners • speakers • tape cartridges • universal serial bus (USB).
User may include:	• department within the organisation • person within a department • third party.
Cable may include:	• Category 5e, 6 or 7 • crossover • fibre • shielded twisted pairs (STP) • straight through • unshielded twisted pairs (UTP).
Standard may include:	• EIA/TIA 568A • EIA/TIA 568B.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5201A Install, configure and test a server

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install and configure a server as part of an upgrade to an existing network or the implementation of a new network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers employed by telecommunications companies and IT networking provisioning companies who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit when working on: • server installation, configuration and testing in field work • server operating systems, protocols and diagnostics required for integrating new and converging functionalities to the network.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to install a server	1.1. Prepare for work in line with site specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures 1.2. Notify customer to arrange access to site 1.3. Obtain ***server applications*** and features from ***appropriate person*** 1.4. Choose the most suitable ***server*** with reference to required server application and server features 1.5. Choose the most suitable ***network operating system*** features with reference to required server solution and technical ***requirements*** 1.6. Provide alternative server solutions with reference to required server application and server features 1.7. Review required installation options 1.8. Analyse data migration requirements 1.9. Apply backup and recovery requirements with reference to organisational policy 1.10. Analyse education and training requirements for support staff and in line with ***client***, requirements and relevant enterprise policies 1.11. Create and document a deployment plan 1.12. Advise ***user*** group of deployment and potential down times
2. Install and configure the server	2.1. Backup and restore local data in preparation for installation 2.2. Install and configure the server as required by technical requirements and functional specifications 2.3. Install and undertake configuration activities using relevant operating system and application upgrades 2.4. Reconnect and reconfigure relevant connectivity devices
3. Test the server and reconfigure the network	3.1. Run the ***system*** testing for benchmarking against client specification and requirements according to test plan, and record outcomes 3.2. Analyse the error report and make changes as required 3.3. Test required changes or additions 3.4. Validate changes or additions against specifications
4. Complete	4.1. Make and document server ***configuration*** and

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ELEMENT	PERFORMANCE CRITERIA
documentation and clean up work site	operational changes 4.2. Tabulate test results and complete all documentations for users 4.3. Complete client report and notify of status of the network 4.4. Clean up and restore worksite to client's satisfaction 4.5. Secure sign-off from appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to interpret technical documentation and write reports in required formats
- numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of network
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments
- research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels
- technical skills to select and use server diagnostic test, application software and hardware to suit different network applications

Required knowledge

- Australian Computer Society Code of Ethics
- common network:
  - cable types and connectors
  - topologies
- compatibility issues and resolution procedures
- desktop applications and operating systems as required
- documentation skills for networks
- enterprise communication/training systems in relation to training and advising staff

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REQUIRED SKILLS AND KNOWLEDGE

involved in the deployment
• features of:
  • current network operating systems (NOS)
  • current server applications compatibility issues and resolution procedures
• implementation and configuration of servers
• system backup procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse server and network operational issues • apply user applications and relate user needs when configuring a server • create technical and user documentation • install and configure server • test server and reconfigure network • troubleshoot server and network failures.

Context of and specific resources for assessment	Assessment must ensure:
	• site where server installation may be conducted
	• relevant server specifications:
	  • cabling
	  • networked (LAN) computers
	  • server diagnostic software
	  • switch
	  • technical requirements for a network
	  • WAN service point of presence
	  • workstations
	• relevant regulatory documentation that impacts on installation activities.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate installing or updating network • oral or written questioning of required skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, test results and recommendation to network changes.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended,

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EVIDENCE GUIDE	
	for example: • ICTTEN4198A Install, configure and test an internet protocol network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Server applications may include:	• database and data warehousing • directory services • file sharing

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RANGE STATEMENT	
	• line of business applications • management • messaging • network and remote access • printer sharing • terminal services • web services.
Appropriate person may include:	• authorised business representative • client • IT support manager • network administrator • network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
Server may include:	• application or web servers • BEA Weblogic servers • email servers • file and print servers • firewall servers • FTP servers • IBM VisualAge and WebSphere • Novell NDS servers • proxy or cache servers.
Network operating system may include latest versions of:	• Apple OS • Linux OS • Unix OS • Windows OS.
Requirements may be in reference to:	• application • business • database • network • people in the organisation • platform • system.
Client may include:	• external organisations • individuals • internal departments • internal employees.

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RANGE STATEMENT	
User may include:	• department within the organisation • person within a department • third party.
System may include:	• application service provider • applications • databases • gateways • internet service provider (ISP) • operating systems • servers.
Configuration may include:	• access control needs • cache sizes • consumers and suppliers • database cache • directory configuration • domain name system (DNS) • entry cache • hostnames • IP addresses • large objects • lightweight directory access protocol (LDAP) clients • log file rotation • NetBIOS naming • network connectivity issues • port numbers • root domain name (DN) • search and write performance • server domains.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

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Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5203A Dimension and design a radio frequency identification system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake a radio frequency identification (RFID) installation, configuration and testing. This could be part of the upgrade to an existing or the implementation of a new logistical or security network using RFID technology according to design specifications. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers in field work who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit to integrate new and converging functionalities to a network. They would be employed by telecommunications and IT networking provisioning companies specialising in RFID technology.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to dimension and design an RFID system	1.1. Obtain ***business requirements*** for the ***client*** from an ***appropriate person*** for the design of the ***RFID system*** 1.2. Research ***RFID technologies***, their functionalities and the different implementations of configurations 1.3. Select suitable software and hardware types to ensure that the proposed system is designed to meet business requirements 1.4. Conduct a survey of available interrogators or readers, tags and wireless units
2. Dimension and design an RFID system	2.1. Select the most appropriate interrogators or readers for the given specification to ensure their compatibility with current network infrastructure if applicable 2.2. Minimise interrogator to interrogator interference 2.3. Verify that antenna geometry and footprint are consistent with the chosen design 2.4. Minimise sources of interference 2.5. Incorporate into the ***RFID design*** the use of anti-collision protocols 2.6. Customise appropriate ***tag to client requirements*** 2.7. Predict the performance for read distance, write distance and tag response time to confirm that these conform with client requirements 2.8. Select the ***optimal locations*** for an RFID tag to be placed on an item 2.9. Prepare a design proposal for the RFID system including ***specifications*** 2.10. Prepare a report containing design ***solutions*** and recommendations of preferred products, including the justification for recommendations 2.11. Submit report to client for approval
3. Document the specified design	3.1. Complete documentation according to client requirements 3.2. Inform client about standards applying to the design 3.3. Secure sign off of RFID design from appropriate person

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to interpret technical documentation and write reports, design solutions and recommendations in required formats
- numeracy skills to interpret technical specifications and evaluate possible design solutions for optimum RFID system
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt configuration procedures to requirements of RFID network
- research skills to interrogate RFID vendor databases and website to implement different configuration requirements to meet client design specifications
- technical skills to:
  - evaluate and select RFID interrogators, readers and wireless units
  - evaluate antenna designs and protocols for design considerations to suit particular RFID system

Required knowledge

- business process design
- client business operations, business function and organisation
- compatibility issues with existing system and resolution procedures
- configuration of internet protocol (IP) networks
- customer and business liaison
- desktop applications and operating systems as required
- linkage between operational processes
- network protocols and operating systems
- network topologies
- radio spectrum and RFID frequencies
- RF interference
- RFID architecture
- RFID hardware and software
- RFID technologies incorporating substantial depth in network operating systems, protocols, interrogators and sensors, wireless technologies and cabling standards
- RFID vendor product knowledge
- security protocols, standards and data encryption

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • adapt RFID technologies to specified plan and design • evaluate RFID client specifications against accepted industry practices • include RFID architecture across a secure environment • encode RFID tags • attach encoded RFID tags and track the movement of tagged items • integrate RFID information into business applications • produce design information in configuring the network with IP addressing • produce information that can be shared between businesses • make recommendations and offer optimum design solutions.

Context of and specific resources for assessment	Assessment must ensure:
	• sites providing:
	  • client functional requirements
	  • RFID equipment specifications
	  • database software
	  • simulation software
	  • organisational guidelines
	  • network or computer layout documentation and premises plans.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate undertaking an RFID installation, configuration and testing • oral or written questioning to assess required knowledge • evaluation of research methodologies and the final

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EVIDENCE GUIDE	
	design proposal prepared by the candidate outlining solutions and recommendations.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN5204A Produce technical solutions from business specifications. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Business requirements may include:	• application of RFID • business inventory • network or people in the organisation • systems currently in use
Client may include:	• external organisations • individuals • internal departments • internal employees • logistic company • security organisation • warehouse.
Appropriate person may include:	• authorised business representative • client • IT support manager • network administrator • RFID network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
RFID system may include:	• antenna • cabling • databases • interrogators or readers • power supplies • tags • wireless units.
RFID technologies may include:	• RFID and networking tools and equipment • RFID interrogators/readers and tags • servers and workstations.
RFID design may include:	• hardware upgrades • implementing a new system • new hardware • new software • simulation software • software upgrades • user training.
Tag to client requirements may include:	• encryption requirements • memory size • security.

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RANGE STATEMENT	

Optimal locations may include:	• media and adhesive selection for tags
	• package contents
	• packaging:
	  • inserts
	  • items
	  • labels
	  • tags
	• product to attach to:
	  • liquids
	  • metal
	  • polarisation
	• tag orientation and location
	• tag stacking (shadowing).

Specifications may include:	• cable drops
	• device mounting locations
	• electrical specifications for:
	  • adapters
	  • interrogators
	  • power units
	  • readers
	  • sensors
	  • tags
	  • wireless units
	• interrogation zone locations
	• RFID network topology
	• site diagrams.

Solutions may include:	• hardware upgrades • implementing a new system • new hardware • new software • software upgrades • user training.

Unit Sector(s)

Unit sector	Telecommunications

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5204A Produce technical solutions from business specifications

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to compile and evaluate the business specifications from a client and to produce business solutions for consideration. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers in field work who carry out network design and implementation of practical technical solutions of ICT networks apply the skills and knowledge in this unit. They would be employed by telecommunications and IT networking provisioning companies specialising in integrating the converging and emerging technologies of ICT networks.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to produce technical solutions from business specifications	1.1. Obtain ***business requirements*** and ***business specifications*** for the ***client*** from ***appropriate person*** 1.2. Research and identify the business model of the client 1.3. Determine technical specifications for business 1.4. Clarify and confirm the business ***problem*** and key stakeholders' ***requirements*** with stakeholders 1.5. Document business objectives and problem and confirm details with appropriate person
2. Evaluate the impact of the technical requirements	2.1. Review and assess business problems, opportunities and objectives 2.2. Determine ***technical requirements*** in respect of input and output, interface, process flow or quality requirements 2.3. Analyse ***hardware***, ***software*** and ***network*** requirements 2.4. Build business platform based on software solutions 2.5. Investigate processes to be changed by the business solution 2.6. Produce an evaluation document on the ***impact*** of the technical requirements on the business
3. Produce technical business solutions	3.1. Develop ***technical solutions*** in response to problems and business requirements 3.2. Determine costs involved to implement the technical business solution 3.3. Investigate a range of supplier products to determine which one best meets technical requirements 3.4. Produce a report document on the technical solutions addressing the business specifications and recommendations against business requirements
4. Document and validate the agreed solutions	4.1. Forward technical requirements and solution overview to appropriate person for feedback 4.2. Analyse feedback and incorporate change as required 4.3. Document changes and distribute to appropriate person 4.4. Obtain sign off on final business solution

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to interpret technical documentation and write reports, design solutions and recommendations in required formats
- numeracy skills to interpret business requirements and specifications and evaluate possible technical design scenarios for optimum solution
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt varied business procedures to requirements
- research skills to interrogate vendor databases and website to implement different solutions to meet client business specifications
- technical skills to:
  - determine technical specifications
  - evaluate optimum solutions
  - produce technical solutions

Required knowledge

- business processes
- client business domain, business function and organisation
- compatibility issues and resolution procedures
- configuration of internet protocol (IP) networks
- customer and business liaison
- desktop applications and operating systems as required
- documenting technical specifications
- linkage between processes
- security protocols, standards and data encryption
- technologies, such as:
  - ICT network topologies
  - network protocols and operating systems
  - radio frequency (RF) networks and principles
  - optical networks and principles
  - mobile cellular networks
  - core networks
  - access networks
  - radio frequency identification (RFID) hardware and software.

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • adapt technologies to specified technical solutions • use site design software and hardware • evaluate client specifications against accepted industry practices • produce technical solutions from business specifications • produce information that can be shared between businesses • apply design concepts to business solutions • produce technical reports • make recommendations and offer optimum design solutions.
Context of and specific resources for assessment	Assessment must ensure: • client functional requirements • business specifications • database software • simulation software • organisational guidelines • network/computer layout • site design software and hardware • information on a range of ICT business solutions.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of evaluation document prepared by the candidate outlining the impact of technical requirements on the business • oral or written questioning assessing required knowledge • review of research methodologies and the final proposal prepared by the candidate outlining solutions and recommendations.

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EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN5203A Dimension and design a radio frequency identification system • ICTOPN6128A Design a dense wavelength division multiplexing system. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Business requirements may include:	• business application • business plan • existing system • mission statement • nature of the business • network or people in the organisation.
Business specifications may include:	• budget allocation • budget costs estimate • future plan • growth forecast • technical requirements • timeline.
Client may include:	• external organisations • finance company • health industry • ICT company • individual people • internal departments • internal employees • manufacturing company • service industry.
Appropriate person may include:	• authorised business representative • client • ICT network administrator • ICT network manager • ICT support manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
Problem may refer to:	• application • business • business need or opportunity that needs to be addressed • network or people in the organisation • system.
Stakeholders may include:	• development team • project team • sponsor • user.

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RANGE STATEMENT	
Requirements may be in reference to:	• application • business • database • network • people in the organisation • platform • system.
Technical requirements may refer to:	• bandwidth • hardware problems • network growth • network security • network traffic congestions • new technologies • power usage • software problems • transmission dropouts • upgrades.

Hardware may include:	• cabling networks
	• internet protocol TV (IPTV)
	• multimedia
	• network elements:
	  • gateways
	  • local area network (LAN) switches
	  • routers
	  • servers
	  • wireless networks
	• optical networks
	• radio networks
	• RFID equipment
	• switching equipment
	• transmission equipment
	• voice and data equipment.

Software may include:	• commercial • customised software • in-house • packaged.
Network may include:	• broadband • data • ICT networks

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RANGE STATEMENT	
	• internet • intranet • media • radio • RFID • security • switching • telecommunications • transmission.
Impact may refer to:	• fewer downtimes • improved efficiency • improved response times • increased return on investment (RoI) • lower operational costs • more 'user friendly' network.

Technical solutions may include:	• audit requirements
	• changes to:
	  • network infrastructure
	  • security or privacy provisions
	• e-business or e-commerce solution
	• hardware upgrades
	• implementing a new system
	• inventory management
	• new hardware
	• new software
	• occupational health and safety (OHS) requirements
	• quality requirements
	• software upgrades
	• user training.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

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Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN5217A Plan a wireless mesh network

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan a wireless mesh network comprised of radio nodes organised in a mesh topology. Wireless mesh networks provide users with secure wireless roaming beyond traditional wireless local area network (LAN) boundaries and are readily deployed in areas that lack wired backhaul. The mesh topology and ad-hoc routing give mesh networks stability, offer redundancy and have the ability to self-form and self-heal. Mesh networks enable local communities and those in remote areas to participate in a distributed shared network without the need for centralised management. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Technical staff who work with wireless networking equipment or radio communications equipment apply the skills and knowledge in this unit to design a scalable wireless access network using mesh technology for growing communities. This may include planning officers and field officers from private and public organisations.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Research wireless mesh networks and formulate the system architecture	1.1. Confirm with regulatory spectrum management authority the ***specific regulations*** regarding radio characteristics 1.2. Contact customer to determine ***wireless mesh network*** design specifications 1.3. Evaluate the use of ***frequency bands*** for the operation of the WMN 1.4. Evaluate and select the ***wireless technology***, ***internet protocol*** (***IP***) version and ***mesh routing protocol*** to satisfy design criteria 1.5. Specify and source the ***hardware and software requirements***
2. Prepare a detailed plan for the mesh network	2.1. Evaluate the maximum line of sight distances achievable between backbone nodes and between mesh nodes 2.2. Plan the sites where mesh nodes will be located and plot to scale on a map 2.3. Estimate the quantity and length of the links required between mesh nodes to ensure design is within specifications 2.4. Design backbone links in the mesh topology for scalability of future deployments 2.5. Select the location of the internet ***gateway*** for the network 2.6. Allocate operating frequencies at mesh nodes, backbone nodes and wireless access points for optimum network performance with minimal interference from adjacent network routers
3. Plan the IP addresses and subnet mask	3.1. Produce an addressing scheme and allocate IP addresses and subnet mask to mesh nodes, backbone nodes and access points 3.2. Produce a configuration scheme to secure the network
4. Document the mesh network	4.1. Document the plans and drawings for the mesh network 4.2. Produce an ***installation plan*** for the building of the mesh network 4.3. Following installation, configuration and testing of the mesh network, incorporate 'as built' amendments if appropriate

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analysis skills to evaluate information and make recommendations
- communication skills to liaise with vendors and installation personnel on technical and operational matters
- literacy skills to interpret technical documentation and write reports in required formats
- numeracy skills to perform calculations, interpret results and evaluate different types of technical data
- planning and organisational skills to plan, prioritise and monitor own work and that of others
- problem solving and contingency management skills to adapt testing procedures to requirements of particular situations and modify activities depending on operational contingencies, risk situations and environments
- technical skills to:
  - configure and set up IP addresses and subnet masks
  - install software
  - select and specify appropriate performance tests and test equipment

Required knowledge

- antenna gain, polarisation
- cable loss
- calculation of effective isotropic radiated power (EIRP)
- calculation of line of site radio range
- decibels and related units
- IP addressing and subnet masks
- network security and firewalls
- network topologies
- radio frequency (RF) frequency bands
- routing protocols
- transmission control protocol (TCP)-IP protocols
- wireless networking hardware, access points, wireless routers and gateway
- wireless protocols

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • evaluate and select wireless technology and mesh routing protocol • plan a wireless mesh network from a project brief • produce an IP addressing scheme • prepare an installation plan.
Context of and specific resources for assessment	Assessment must ensure: • sites where planning a wireless mesh network may be conducted • design criteria and other site related documentation • equipment specifications and technical documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate planning a wireless mesh network • review of plan prepared by the candidate outlining recommendations for the customer • review of IP addressing scheme prepared by the candidate • oral or written questioning to assess knowledge of equipment and technologies as used within the mesh network.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4050A Install and configure a wireless mesh network • ICTRFN3055A Install a radio communications antenna and feedline.

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EVIDENCE GUIDE	
	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Specific regulations may include:	• maximum allowable antenna gain • maximum allowable EIRP • maximum allowable power output for transmitter • use of the 2.4 GHz band • use of the 5.8 GHz band.
Wireless mesh network may	• client wireless mesh network - client nodes perform routing

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RANGE STATEMENT	
include:	• hybrid wireless mesh network - perform mesh and access functions • infrastructure wireless mesh network - mesh routers for the clients.
Frequency bands may include:	• multiple frequencies for access and transmission • same frequency for access and transmission • separate frequencies for access and transmission.
Wireless technology may include:	• 802.11a • 802.11b • 802.11g • 802.11n • 802.11s draft IEEE 802.11 amendment • 802.16.
Internet protocol (***IP***) may include:	• IPv4 • IPv6.
Mesh routing protocol may include:	• ad-hoc on-demand distance vector (AODV) • better approach to mobile ad-hoc networking (BATMAN) • dynamic source routing (DSR) • hybrid wireless mesh protocol (HWMP) • infrastructure wireless mesh protocol (IWMP) • optimised link state routing protocol (OLSR).

Hardware and software requirements may include:	• hardware:
	  • access points
	  • antenna polarisation
	  • directional microwave antennas
	  • omnidirectional microwave antennas
	  • wireless routers
	• software:
	  • open source software:
	  • FreeBSD
	  • Freifunk
	  • proprietary.

Gateway may include:	• asymmetric digital subscriber line (ADSL) • very small aperture terminal (VSAT).
Installation plan may include:	• addressing scheme • configuration instructions and commands

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RANGE STATEMENT	

	• frequency allocation plan
	• network element details:
	  • MAC address
	  • model, type and serial number
	• security implementation
	• siting of mesh routers and gateways
	• software version.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN6172A Design and configure an IP-MPLS network with virtual private network tunnelling

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to design an internet protocol-multiprotocol label switching (IP-MPLS) network, examine MLPS data flow and configure virtual private network (VPN) tunnelling. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	This unit applies to technical staff dimensioning an IP-MPLS Core Network for a carrier or an internet service provider (ISP). MPLS and VPNs are used to provide secure, reliable and fast IP services in technology convergence of data, voice and video. Relevant job roles include designer and installer of Next Generation Networks (NGN). These IP networks provide fast internet, voice over internet protocol (VoIP) and internet protocol TV (IPTV) services.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and design a IP-MPLS network to meet business requirements	1.1. Determine the IP-MPLS ***network design requirements*** in consultation with ***enterprise customer*** 1.2. Optimise ***factors*** affecting design 1.3. Use label stacking to route MPLS packets in the network to build of ***MPLS services*** 1.4. Dimension layer-3 generation of core backbone to allow MPLS IP-VPN to provide ***MPLS convergence*** services 1.5. Use MPLS control plane to set up wavelengths 1.6. Produce the design topology of a MPLS ***network*** to include the location and types of edge label switch routers (LSR) and core LSRs in agreement with enterprise customer
2. Configure a MPLS network and verify traffic engineering (TE) considerations	2.1. Configure edge and core LSRs to provide secure methods of transporting IP packets in the MPLS network using ***layer 2 protocols*** 2.2. Configure the LSRs to provide toll bypass for convergence of voice and data over the IP network 2.3. Classify traffic in MPLS terms and configure the Edge LSR to sort traffic into forward equivalent classes (FECs) 2.4. Install and remove the two ***standardised signalling protocols*** for managing traffic engineering (TE) of MPLS paths 2.5. Configure the MPLS-TE to provide routing on diverse paths to avoid congestion and guarantee bandwidth services
3. Configure a VPN and provide a virtual private LAN service (VPLS)	3.1. Configure a MPLS VPN tunnel for a customer network to provide multipoint-to-multipoint VPN connectivity 3.2. Build a content hosting server into a MPLS based VPN to produce a media network 3.3. Use virtual private LAN services (VPLS) as a VPN method for wide area network (WAN) multipoint-to-multipoint Ethernet connectivity spanning across multiple metropolitan areas 3.4. Produce a VPLS topology using an internet protocol IP-MPLS cloud with provider edge (PE) routers connecting VPLS domains associated with enterprise customer

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ELEMENT	PERFORMANCE CRITERIA
4. Complete documentation	4.1. Produce a final design plan including network elements, configuration details and recommendations for design changes 4.2. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• analytical skills to use complex technical data to develop network designs
• communication skills to consult with customers
• literacy skills to read and write reports
• numeracy skills to use binary systems
• project planning skills to set benchmarks and identify scope
• problem solving skills to solve a range of predictable network problems
• research skills to identify, analyse and evaluate broad features of a particular business domain and best practice in networking technologies including hardware and software to be installed
• technical skills to:
  • deploy multipoint-to-multipoint VPLS domains via IP-MPLS cloud
  • implement and verify routing information protocol (RIP), enhanced interior gateway routing protocol (EIGRP), open shortest path first (OSPF) and border gateway protocol (BGP) operations
  • implement MPLS architecture across a WAN environment
  • implement secure VPN tunnels across the MPLS network

Required knowledge
• current industry-accepted hardware and software products • network operating systems and cabling standards • networking technologies • the customer business, domain, function and organisation effect on customer requirements and network equipment • transmission technologies and protocols

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and design a MPLS network that meets business requirements • configure and test the MPLS network according to specified guidelines • produce appropriate documentation • implement secure VPN tunnelling.
Context of and specific resources for assessment	Assessment must ensure: • a live network and networked computers • network design documentation, equipment specifications and organisational guidelines • network components, routers, switches and multi-layer switches.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate planning, designing and configuring a MPLS • review of documentation completed by the candidate • oral or written questioning of the candidate to assess required knowledge and skills.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN6216A Design and manage internet protocol TV in a service provider network. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and

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EVIDENCE GUIDE	
	assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Network design requirements may include:	• bandwidth
	• firewalls
	• gateway to wireless local area networks (WLAN)
	• multi-layer switches
	• number and type of core and edge routers
	• number of channels
	• protocols:
	  • BGP
	  • label distribution protocol (LDP)
	  • OSPF
	  • resource reservation protocol (RSVP)

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RANGE STATEMENT	
	• quality of service (QoS) • security • servers • switches • throughput.
Enterprise customer may include:	• banks • clubs • external organisations • hospitals • internal departments • teaching institutions.

Factors may include:	• protocol incompatibility
	• QoS issues:
	  • loss rate
	  • latency
	  • jitter
	  • throughput
	• router availability.

MPLS services may include:	• any transport over MPLS (AToM):
	  • 802.1Q - Ethernet VLAN
	  • asynchronous transfer mode (ATM)
	  • Ethernet
	  • frame relay (FR)
	  • high-level data link control (HDLC)
	  • point-to-point protocol (PPP)
	• BGP MPLS VPN
	• Ethernet virtual circuit Ethernet over MPLS(EoMPLS) reroute link or node failure
	• link or node protection failure:
	  • link resilience
	  • node resilience
	• MVPN (multicast VPN)
	• QoS
	• traffic engineering:
	  • bandwidth utilisation
	  • capacity planning
	  • congestion
	  • virtual lines - toll bypass
	• VPLS.

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RANGE STATEMENT	
MPLS convergence may include:	• ADSL cable • enterprise VoIP • FR-ATM transport • internet access • IPTV • VPN.
Network may include:	• data and voice • edge and core LSR • hosting servers for media content • internet • large and small LANs • national WANs • private lines • use of the public switched telephone network (PSTN) for dial-up modems only • VPNs • wireless.
Layer 2 protocols may include:	• ATM • Ethernet • FR • generic routing encapsulation (GRE) • packet over SONET (POS) • PPP.
Standardised signalling protocols may include:	• CR-LDP • RSVP-TE.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN6206A Produce an ICT network architecture design

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to compile, and evaluate the business specifications from a client and produce a set of architecture design solutions that will cater for present and future forecast demands. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Officers in field work who to carry out design and implementation of technical solutions of ICT networks apply the skills and knowledge in this unit for a practical solution in network design. They would be employed by telecommunications and IT networking provisioning companies specialising in integrating the converging and emerging technologies of ICT networks.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to produce ICT architecture design	1.1. Obtain ***business specifications*** and ***business requirements*** for the ***client*** from ***appropriate person*** 1.2. Review specifications and requirements to identify the type of ***ICT network*** and network specifications required 1.3. Consult with key ***stakeholders*** to identify their requirements 1.4. Assess business problems, opportunities and objectives and confirm details with appropriate person
2. Produce the preliminary ICT network architecture design	2.1. Ascertain ***technical requirements***, including ***hardware***, ***software*** and ***network elements*** according to specifications 2.2. Select software solutions to suit business platform 2.3. Develop preliminary physical network diagrams as a preface to ***architecture*** blueprint 2.4. Produce a document on the possible ***impact*** of the network design on the business requirements
3. Evaluate preliminary design and likely performance using forecast demands	3.1. Predict forecast traffic demands and the impact on network design from current and future demand requirements 3.2. Benchmark the design using expected ***performance parameters*** 3.3. Review the design based on identification of the likely performance profile (best/worst) 3.4. Determine costs involved with a range of supplier products 3.5. Produce an evaluation report on predicted performance and costs of the network architecture design addressing the business specifications and recommendations
4. Finalise network design and obtain approval	4.1. Review the benchmarks and requirements and final design proposed 4.2. Determine the support and training requirements needed 4.3. Obtain the latest technical specifications and pricing by contacting possible vendors 4.4. Document the network design and present ***documentation*** to appropriate person for approval 4.5. Obtain sign off on final business solution

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to read and interpret technical documentation and write reports, design solutions and recommendations
- numeracy skills to interpret business requirements and specifications and evaluate possible technical design scenarios for optimum solution
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt varied business procedures to requirements
- research skills to interrogate vendor databases and websites to implement different solutions to meet client business specifications
- technical skills to:
  - evaluate and make further recommendations for optimum solution
  - produce technical designs

Required knowledge

- broad technical knowledge of technologies:
  - Access Networks
  - Core Networks
  - ICT network topologies
  - mobile cellular networks
  - network protocols and operating systems
  - optical networks and principles
  - radio frequency (RF) technologies and principles
  - radio frequency identification (RFID) hardware and software
- business processes
- client business domain, business function and organisation
- compatibility issues and resolution procedures
- configuration of internet protocol (IP) networks
- customer and business liaison
- desktop applications and operating systems
- documenting technical specifications
- linkage between processes

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REQUIRED SKILLS AND KNOWLEDGE
• security protocols, standards and data encryption

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • adapt technologies to specified technical solutions • use site design software and hardware • evaluate client specifications against accepted industry practices • produce technical designs from business specifications • analyse feedback from client and make adjustment to the proposal • produce information that can be shared between businesses • apply design concepts to business solutions • produce technical reports • make recommendations and offer optimum design solutions.

Context of and specific resources for assessment	Assessment must ensure:
	• sites providing:
	  • client functional requirements
	  • business specifications
	  • database software
	  • simulation software
	  • organisational guidelines
	  • network or computer layout
	  • site design software and hardware
	  • information on a range of ICT business solutions.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of evaluation report prepared by the candidate on predicted performance and costs of the network architecture design outlining the business specifications and recommendations • oral or written questioning on required knowledge

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EVIDENCE GUIDE	
	and skills • evaluation of research methodologies and the final proposal prepared by the candidate outlining solutions and recommendations.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTOPN6128A Design a dense wavelength division multiplexing systems • ICTRFN6171A Produce and evaluate architecture designs for WiMAX networks • ICTTEN6169A Produce and evaluate architecture designs for convergent cellular mobile networks. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT

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RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Business specifications may include:	• budget allocation • budget costs estimate • current system functionality • future plan • growth forecast • technical requirements • timeline • user problem statement.
Business requirements may include:	• business application • business plan • existing system • mission statement • nature of the business • network or people in the organisation.
Client may include:	• external organisations • ICT company • individuals • internal departments • internal employees • service industry.
Appropriate person may include:	• authorised business representative • client • ICT network administrator • ICT network manager • ICT support manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
ICT network may include:	• Access Network • broadband network • Core network • customer network • internet • intranet

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RANGE STATEMENT	
	• multimedia • radio • RFID • security • switching • telecommunications • transmission • voice, video and data.
Stakeholders may include:	• development team • project team • sponsor • user.
Technical requirements may refer to:	• bandwidth • hardware problems • network growth • network security • network traffic congestions • new technologies • power usage • software problems • transmission dropouts • upgrades.

Hardware may include:	• cabling network
	• cellular phone network
	• internet protocol TV (IPTV)
	• IT network elements:
	  • gateway
	  • local area network (LAN) switch
	  • router
	  • server
	  • wireless network
	• multimedia
	• optical network
	• radio network
	• RFID equipment
	• switching equipment
	• transmission equipment
	• voice and data equipment.

Software may include:	• commercial

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RANGE STATEMENT	
	• customised software • in-house • network management • operating system • packaged • patches • vendor propriety.

Network elements may include:	• add-drop multiplexer
	• antenna
	• base station
	• dense wavelength division multiplexing (DWDM) unit
	• encoder
	• IT network elements:
	  • gateway
	  • LAN switch
	  • router
	  • server
	  • wireless network
	• laser module
	• optical unit
	• protocol analyser
	• receiver
	• RF unit
	• RFID unit
	• splitter
	• transmitter.

Architecture may include but is not limited to:	• carrier network architecture:
	  • Access
	  • billing
	  • broadband
	  • broadcasting
	  • Core
	  • data
	  • optical
	  • wireless
	• configuration:
	  • large memory model
	  • requests per second

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RANGE STATEMENT	

	• small memory model
	• database software:
	  • Informix
	  • Ingres, DB2
	  • Microsoft SQL server
	  • mSQL
	  • MySQL
	  • Oracle
	  • SQL server
	  • Sybase
	• operating system:
	  • Linux
	  • Mac OS
	  • Novell NetWare
	  • Windows.

Impact may refer to:	• fewer downtimes • improved efficiency • improved response times • increased return on investment • lower operational costs • more 'user friendly' network.
Performance parameters may include:	• attenuation • bandwidth • bit error rate (BER) • congestion • data security • distortion • dropouts • interference • latency • packet loss • phase jitter • polarisation • quality of service - QoS • transmission data rate.
Documentation may include:	• audit trails • client training and satisfaction reports • costing details • design report

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RANGE STATEMENT	
	• evaluation report and recommendations • implementation plan • international standards • International Electrotechnical Commission (IEC) • Institute of Electrical and Electronics Engineers (IEEE) standards • Internet Engineering Task Force (IETF) standards • International Telecommunications Union (ITU) standards • Australian standards • naming standards • version control.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN8194A Investigate the application of cloud networks in telecommunications switching

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to investigate the application of cloud networks (infrastructure-as-a-service) in telecommunications switching. Most infrastructure-based services are embedded in physical infrastructure. Cloud computing and infrastructure-as-a-service changes the focus from the physical infrastructure to the new world of virtual infrastructure. No longer are services built around floor space, servers or ports, but rather around virtual machine (VM) images, application instances, and virtualised storage and networks. Scalability, cost savings, security, flexibility of infrastructure and energy consumption are significant factors when business considers cloud networks. Applications involving cloud networks are developed to support business strategies. Cloud network solutions support the application of Next Generation Technologies (NGN). No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Telecommunication planning engineers and senior technical staff apply the skills and knowledge in this unit to investigate the application of cloud networks (infrastructure-as-a-service) in telecommunications switching. Technical planners develop strategies to accommodate shortfalls in capacity and functionality for a switching

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	network, and develop solutions for network growth using emerging technologies.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Evaluate current physical network infrastructure	1.1. Analyse the scalability, functionality, cost, security and energy consumption of existing physical network infrastructure 1.2. Report on the shortfalls and risks of existing physical infrastructure in accommodating network growth and increased functionality 1.3. Investigate capacity and functionality shortfalls of existing physical infrastructure to highlight the limitations of the existing switching network 1.4. Document estimated costs and issues associated with meeting capacity and functionality shortfalls using existing physical infrastructure
2. Investigate the application of cloud networks	2.1. Analyse trends in **cloud networks** (infrastructure-as-a-service) technologies and **multiprotocol label switching** (**MPLS**) architectures against the rapid changes in the landscape 2.2. Determine the applicability of cloud networks (infrastructure-as-a-service) to meet capacity and functionality requirements of the network 2.3. Assess the risks in using cloud networks to meet capacity and functionality requirements of the network 2.4. Evaluate a range of cloud network solutions and justify the selection of an optimum network switching solution 2.5. Develop solution elements using a series of small project elements 2.6. Produce a cloud network alternative solution to emulate the existing Core Network of a service provider
3. Analyse the impact of the cloud network solution for system integration and across business domains	3.1. Prepare a plan for organisational change control process and the ***integration of cloud network solutions*** within a complete network infrastructure 3.2. Prepare a test scenario and produce a ***test management schedule*** for the testing process of system elements and interfaces using simulation 3.3. Use ***integration document software*** to replicate issues exhibited in test environment 3.4. Certify cloud network solution compatibility and compliance to requirements using web based test

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ELEMENT	PERFORMANCE CRITERIA
	management tool (quality centre) to conduct ***performance evaluation tests*** 3.5. Analyse test reports to evaluate load balancing and network security issues in test environment 3.6. Document and resolve conflicts detected in simulation testing
4. Develop a business case for implementation of a cloud network	4.1. Prepare a cost-benefit analysis of the cloud network solution as a business case to evaluate the return on investment (RoI) 4.2. Investigate staging of the solution and timing implementation of the project elements as a scenario for real life implementation 4.3. Research and report on the ***key features*** of cloud network implementation in a business case study

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

• analytical skills to evaluate the existing physical network infrastructure
• communication skills to:
  • interact with enterprise personnel, customers and other contractors, while maintaining a customer focus and consideration of customer needs
  • work effectively within a group
  • liaise with internal and external personnel on technical and business matters
• literacy skills to:
  • prepare reports given a specific format
  • read and interpret technical documentation, software and hardware manuals, specifications and relevant enterprise policy
• numeracy skills to analyse requirements
• PC skills to use a word processor to translate enterprise and technology issues into a cloud network solution
• planning and organisational skills to:
  • manage and prioritise own work
  • manage solution elements

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REQUIRED SKILLS AND KNOWLEDGE

• break up large project component into a series of smaller project components
• problem solving skills to solve domain, technology and logistics problems
• safety awareness skills to follow all related occupational health and safety (OHS) requirements and work practices
• task management skills to work systematically with required attention to detail and adherence to project requirements
• technical skills to:
  • prepare a test scenario and test regime for the simulation
  • resolve system conflict or defects following simulation testing
  • set up test management schedules and diagnose interface requirements

Required knowledge
• analysing infrastructure-as-a-service components • existing digital switching technology in service provider core network • information required to develop architectural solutions • integration document software • new cloud network technologies • overview knowledge of cloud networking transmission, transmitter and receiver architecture and their associated infrastructure • performance and integration requirements • prepare and/or interpret technical documentation • protocols as used on the MPLS and infrastructure-as-a-service • specific knowledge related to network components and their functions • specific organisational requirements relating to the computer systems • typical issues and challenges that occur with system changes

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • evaluate the current physical network infrastructure's capacity and functionality shortfalls • investigate the application of cloud networks and plan the architectural design • develop components of cloud networking solution for meeting capacity and functionality requirements of the network • assess the risks in using cloud networks to meet capacity and functionality requirements of the network • analyse impact of integration of cloud network solution on the network • prepare a test plan with test scenario and produce a test management schedule • use integration document and software test management tools to replicate issues exhibited in test environment • certify cloud network solution compatibility and compliance • prepare a cost-benefit analysis of the cloud network solution • develop a business case for implementation of a cloud network.
Context of and specific resources for assessment	Assessment must ensure: • site where the application of cloud networks in telecommunications switching may be investigated • software tools currently used in industry • vendor products, specifications, equipment and enterprise policy required for the activity.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate investigating the

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EVIDENCE GUIDE	
	application of cloud networks and planning the architectural design • review of reports, plans and business case for a cloud network solution prepared by the candidate • oral or written questioning of the candidate to assess knowledge of cloud networks.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN8197A Produce engineering solutions using numerical computations and simulation. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different

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RANGE STATEMENT	
work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Cloud networks refers to:	• delivery of internet protocol (IP) infrastructure (typically a platform virtualisation environment) as a service • overlays the IP network using MPLS.
multiprotocol label switching (***MPLS***) refers to:	• encapsulating packets of various network protocols • use in creating virtual links between distant nodes • use in high-performance telecommunications networks which direct and carry data from one network node to the next • using layered protocols using the OSI 7 layer model.

Infrastructure-as-a-service may include:	• computer hardware (typically set up as a grid for massive horizontal scalability)
	• computer network:
	  • firewalls
	  • gateways
	  • load balancing
	  • MPLS switch
	  • servers
	• internet connectivity
	• platform virtualisation environment for running client specified virtual machines
	• service level agreements
	• utility computing billing:
	  • per instance hour.

Integration of cloud network solutions may include:	• hardware compatibility • no contentions • platform compatibility • protocol compatibility • signalling contention • software compatibility • system interoperability • technology compatibility.

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RANGE STATEMENT	
Test management schedule may include:	• post-installation test procedures • pre-installation test procedures • produces test summary report • profiling of software solution • risk defects report • simulation testing • test process is testable for network software built.
Integration document software may include:	• fine-tuning capabilities in multi-operating environments • integration with existing system • links to legacy systems.
Performance evaluation tests may include:	• defects (defects detected are logged and mapped to failed cases) • releases (manage software releases and iterations) • requirements (traceability and management) • test lab (execute test cases from test plan) • test plan (creating and updating test cases).
Key features may include:	• bandwidth on demand • distribution • enhanced rate • transmission.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Telecommunications networks engineering

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ICTTEN8195B Evaluate and apply network security

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to analyse the security features of an internet protocol (IP) based telecommunications network.

This applies to IT networking and telecommunications networking topologies.

Application of the Unit

Telecommunication engineers apply the skills and knowledge in this unit to analyse and report on the security of an ICT network, particularly Internet security.

They are responsible for the evaluation of security of ICT networks using converging switching and transmission technologies in local area networks (LAN) and wide area networks (WAN), broadband networks, internet protocol TV (IPTV) and virtual networks.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

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Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Analyse the operation of the Internet	1.1 Evaluate the interrelationship of IP to open systems interconnect (OSI) seven layer model and the impact on network topologies and ***network elements*** 1.2 Assess media access control (MAC) and IP addressing and their application in security 1.3 Report on transmission control protocol/internet protocol (TCP/IP) operations and the use of ***transport protocols*** for transmitting data over the network 1.4 Examine the various types of ***routing protocols*** and implication on security 1.5 Analyse forms of ***label switching*** as applied to data packets 1.6 Use software to simulate the ***least cost algorithms***
2. Analyse internetwork protocols	2.1 Compare connection-oriented and connection-less networks in internetworking applications 2.2 Research the ***design parameters*** used in networks 2.3 Produce a report on IP multi-casting protocols and systems including IP ***frame fields*** of the data frames
3. Research and report internetwork operations	3.1 Analyse protocol considerations of voice over internet protocol (VoIP) 3.2 Research the protocols G723.1, G729 and G729A standards and evaluate their application in internetworking 3.3 Determine the format of JPEG and GIF files as applied to still pictures 3.4 Determine the format of MPEG-2 and H.32x series multimedia protocols for motion pictures 3.5 Evaluate the features of different of ***multi-service protocols*** and of different ***email system protocols*** in networking operations 3.6 Produce a report on the features the different ***web-based protocols*** used in internetworking operations
4. Analyse features and types of network security	4.1 Analyse procedures and processes used for security attacks and use of protection mechanisms 4.2 Research conventional ***encryption algorithms*** and determine possible locations of encryption devices 4.3 Produce a report on conventional encryption key distribution problems and how message authentication and verification is achieved

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	4.4 Research one-way hashing and secure ***hashing functions*** 4.5 Produce a report on digital signature standard (DSS) principles including ***public key cryptography algorithms*** for network security
5. Research features of public key authentication and email network security protocols	5.1 Research public key authentication using Kerberos 5.2 Analyse how electronic mail security is achieved using pretty good privacy (PGP) 5.3 Research and report on ***IPSec*** protocol security 5.4 Produce a report on encapsulating security payload (ESP) including Internet ***key management processes***
6. Research features of web, network management and system security	6.1 Analyse how web threats and attacks occur in an IP network and determine system intruders and threats 6.2 Research the operation of ***transaction protocols*** 6.3 Evaluate the processes used for selection and protection of system passwords 6.4 Evaluate ***system threats*** and methods used to counter act the threats 6.5 Produce a report on anti-virus protection strategies, including firewall design principles, types and configurations
7. Document evaluation report	7.1 Present a final report to include research and evaluation of network security management principles and the application to the network in the workplace with enhancement recommendations

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate a range of complex technical data
- communication skills to work effectively within a group and present information
- information technology skills to use:
  - software for desktop research
  - statistical data
  - word processing software
- literacy skills to prepare reports given a specific format and read and interpret technical standards
- planning and organisational skills to manage own work in specific time frames
- research skills to gather and record data from measurements
- technical skills to:
  - operate test equipment
  - use telecommunications management networks.
  -

Required knowledge

- administrative network management systems
- algorithms
- cryptography
- encapsulation
- encryption
- enterprise solutions
- firewalls
- network topologies
- operations network management systems
- organisational policy and procedures
- protocols
- routing theory
- system threats
- transaction protocols
- workplace and industry environment.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse the operation of the Internet • implement Internet technology • select Internetwork protocols • research and report various internetwork operations • analyse features and types of network security methods and their weaknesses • analyse features of various cryptography systems • research and report the features of public key authentication and email network security protocols • research and report the features of web, network management and system security.
Context of and specific resources for assessment	Assessment must ensure: • a telecommunications operations site with a mentor or supervisor appropriately experienced in relevant telecommunications technology and infrastructure • networked computers and relevant software.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • oral or written questioning to assess required knowledge • direct observation of the candidate carrying out relevant security checks within a networked communication system • review of reports completed by the candidate for different security breached scenarios.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example: • ICTPMG8143B Manage a telecommunications project

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	• ICTPMG8149B Evaluate and use telecommunications management networks. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Network elements may include:	• bridges • gateways • routers • servers • switches.
Transport protocols may include:	• Ethernet • point-to-point protocol (PPP) • synchronous data link control (SDLC) • synchronous optical network (SONET).
Routing protocols may include:	• adaptive • enhanced interior gateway routing protocol (EIGRP) • fixed • flooding • interior gateway routing protocol (IGRP) • open shortest path first (OSPF) • random • routing information protocol (RIP).
Label switching may include:	• cell switching routers (CSR) • IP • tag.
Least cost algorithms may include:	• Bellman-Ford's • Dijkstra's.
Design parameters may include:	• datagram lifetime • error and flow control techniques • fragmentation • reassembly • routing.
Frame fields may include:	• datagram format • internet control message protocol (ICMP) • IPv6 header and addressing • protocol data unit (PDU).
Multi-service protocols	• border gateway protocol (BGP) • OSPF

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may include:	• resource reservation protocol (RSVP) • real time control protocol (RTCP) • real time protocol (RTP).

Email system protocols may include:	• data transparency:
	  • ASCII
	  • binary
	  • EBCDIC
	  • radix64 coding
	  • Unicode
	• multipurpose mail extensions (MIME)
	• simple mail transfer protocol (SMTP).

Web-based protocols may include:	• common gateway interface (CGI) • file transfer protocol (FTP) • hyper-text mark-up language protocol (HTML) • hyper-text transfer protocol (HTTP) • Java applets and application programmers interface (API).
Encryption algorithms may include:	• Blowfish • Data Encryption Standard (DES) • Feistel Cipher • International Data Encryption Algorithm (IDEA).
Hashing functions may include:	• hash message authentication checksum (HMAC) • Secure HAsh (SHA-1).
Public key cryptography algorithms may include:	• Dieffie-Hellman key exchange • Rivest Shamir Adleman (RSA).
IPSec may include:	• authentication header • internet protocol (IP) security • transport and tunnel modes of operation.
Key management processes may include:	• internet security association and key management protocol (ISAKMP) • Oakley key determination protocol (OKDP).
Transaction protocols may include:	• secure electronic transaction (SECT) • simple network management protocol (SNMP) • SNMPv1 (community facility and proxies) • SNMPv3 (message processing and the user security model) • secure socket layer (SSL).
System threats may include:	• logic bombs • trap doors • Trojans

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	• viruses • worms.

Unit Sector(s)

Telecommunications - Telecommunications networks engineering

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ICTTEN8196A Evaluate and apply digital signal processing to communications system

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to analyse, apply and simulate the operation of digital signal processing (DSP) to signals in a telecommunications system. Digital signal processing is essential in digital communications systems including signal conditioning and processing functions such as modulation and multiplexing. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Field officers responsible for the management and maintenance of digital communication systems apply the skills and knowledge in this unit. They combine the technical skills of this unit with design skills to develop solutions in modern applications, such as internet protocol TV (IPTV), digital TV, fast broadband and internet applications.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply DSP design criteria to telecommunications system	1.1. Review ***DSP criteria*** applied to signal processing 1.2. Perform ***frequency domain analysis*** on telecommunications signals 1.3. Apply digital processing techniques to ***DSP baseband communications signals*** used in digital systems 1.4. Generate the output of a comb filter in ***digital filtering*** application using convolution theorem and autocorrelation
2. Determine linear time invariant (LTI) system properties	2.1. Simulate ***telecommunication entities*** using ***simulation software functions*** 2.2. Perform calculations to find numerical approximations of the continuous-time convolution process 2.3. Simulate echo cancellation by applying simulation software using ***adaptive DSP algorithms*** and an inverse filtering method
3. Analyse digital telecommunication signals processing	3.1. Analyse the result of digitally passing a signal through a first-order recursive discrete-time filter 3.2. Determine frequency response of a simple continuous-time system using Fourier transform 3.3. Analyse amplitude modulated signals using Fourier transform
4. Analyse time and frequency forms of signals by applying simulation of signal processing	4.1. Program a simulated software application to represent a comb filter with a signal applied from a ***telecommunication system*** 4.2. Produce a report analysing the simulated output results and relevance of a DSP filter to a telecommunications system

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analytical skills to evaluate a range of complex technical data

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REQUIRED SKILLS AND KNOWLEDGE

• communication skills to work effectively within group
• information technology skills for word processing, using statistical data and desktop research
• literacy skills to:
  • read and interpret technical documentation
  • write reports including recommendations
• numeracy skills to perform mathematical calculations
• research skills to:
  • gather and record data from measurements
  • gather data, observe and analyse signal issues
• technical skills to :
  • apply simulation software
  • operate telecommunication test equipment
  • use telecommunications management networks

Required knowledge
• digital communications systems • Fourier transforms • LTI • modulation methods, amplitude (AM), frequency (FM) and phase (PM) and digital formats • organisational policy and procedures • responses to non-compliance • radio frequency (RF) awareness • workplace and industry environment

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • apply DSP criteria to a telecommunications system • evaluate LTI system properties • analyse DSP, time and frequency forms of signals by applying signal processing.
Context of and specific resources for assessment	Assessment must ensure: • a telecommunications operations site • digital communication systems, simulation software and telecommunications test equipment currently used in industry.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • oral or written questioning to assess required knowledge • direct observation of the candidate carrying out analysis and fault solution development within a digital communication system.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN8197A Produce engineering solutions using numerical computations and simulation. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally

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EVIDENCE GUIDE	
	appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

DSP criteria include:	• anti-alias and reconstructive filters
	• distortion
	• Nyquist sampling rate
	• quantisation error and noise
	• sampling theory
	• signal conditioning
	• signal converters:
	  • ADC
	  • DAC
	• Z-domain representation and transforms.

Frequency domain analysis may include:	• discrete Fourier transform (DFT) • fast Fourier transform (FFT) • modern spectral analysis • power spectra • signals:

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RANGE STATEMENT	
	• aperiodic • periodic • random • time and frequency representation.

DSP baseband communications signals may include:	• bandpass sigma delta systems
	• data equalisation
	• error control and coding
	• matched filtering
	• modulation:
	  • AM
	  • FM
	  • PM
	• pulse shaping
	• quaternary phase shift keying (QPSK) - quadrature amplitude modulation (QAM) digital communications
	• root raised cosine
	• signalling:
	  • amplitude shift keying (ASK)
	  • frequency shift keying (FSK)
	  • phase shift keying (PSK).

Digital filtering refers to:	• comb and ARMA filters • digital filter design parameters and methods • FIR and IIR Filters • poles and zeroes and z-domain.
Telecommunication entities may include:	• discrete-time Fourier transform (DTFT) based filter of given design parameters • DTFT operation • generation of dual tone multi frequency signals • telephone touch tone system.
Simulation software functions may include:	• conv • filter • isim.
Adaptive DSP algorithms include:	• acoustic echo control and noise control • channel equalisation • echo control for feedback suppression • inverse system identification • Kalman

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	• least squares • least mean squares • QR algorithms • recursive least squares (RLS).
Telecommunication system may include:	• AM with carrier • FM • PSK • single-sideband AM.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTTEN8197A Produce engineering solutions using numerical computations and simulation

Modification History

Not Applicable

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Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to analyse, calculate and solve complex mathematical engineering problems that provide underpinning knowledge and skills for advanced telecommunication mathematical systems requiring numerical simulation No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	Telecommunication network engineers apply the skills and knowledge in this unit. It involves the application of complex mathematical analysis to technical problems. It involves the design and evaluation of systems and networks, system enhancement, and interaction with design engineering sections from manufacturers to resolve telecommunications network problems that are not common. Relevant job roles may include: • digital signal processing • antenna performance and propagation evaluation • queuing systems • forecasting • data analysis • capacity predictions • traffic engineering • radio networks.

Licensing/Regulatory Information

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Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use advanced engineering mathematics for a range of complex engineering solutions	1.1. Solve mathematical ***functions*** using ***complex trigonometric ratios*** 1.2. Solve mathematical functions using manipulation of ***matrices and determinants*** to perform ***standard calculations*** 1.3. Solve ***trigonometric functions*** using ***operations on complex numbers*** 1.4. Solve complex functions using ***integral and differential calculus*** 1.5. Solve mathematical functions using ***ordinary differential equations*** (***ODE***) 1.6. Solve mathematical equations using ***Laplace transforms*** 1.7. Solve mathematical problems using ***algorithmic control structures*** 1.8. Use software simulations where possible to produce ***simulated calculations*** for a range of ***engineering solutions*** 1.9. Analyse the results from the simulated solution and compare to the derived solutions to adjust any variables in the calculation process
2. Design a simulation control system with queues	2.1. Design a ***simple control system*** using simulation software 2.2. Design a ***queuing system*** using simulation software 2.3. Design a ***stochastic system*** using simulation software 2.4. Document and present all numerical software simulations for the engineering problems

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• advanced mathematical skills to perform a range of complex engineering solutions • communication skills to work effectively within group

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REQUIRED SKILLS AND KNOWLEDGE
• information technology skills for word processing and desktop research • literacy skills to read and interpret technical documentation • numeracy skills to gather and record data from measurements • research skills to gather data and information • technical skills to operate test equipment
Required knowledge
• integration and differentiation processes • mathematical simulations • mathematical theories • numerical analysis of signals • queuing theories • software programming and debugging • software simulation

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • analyse and manipulate functions using symbolic and numerical software, including the operations of entering and manipulating polynomials in suitable software and then substitution of values and graphing • analyse and manipulate matrices and determinants, numerically with and without symbolic and numerical software • design and debug programs using algorithmic control structures and output the results to the screen, a graph and a file • analyse and manipulate complex numbers numerically and with symbolic software • determine and manipulate equations using the advanced calculus operations of differentiation and integration numerically and with symbolic software • determine and manipulate equations of the type called ODE met in telecommunications engineering applications numerically and with symbolic software • determine and manipulate Laplace transforms met in telecommunications engineering applications numerically and with symbolic software • design a simulation control system and simulate queues using software.
Context of and specific resources for assessment	Assessment must ensure: • networked computers • simulation software • relevant documentation.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • oral questioning or written questioning to assess required knowledge • direct observation of the candidate carrying out

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	mathematical simulations • review of simulation control system prepared by the candidate.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example: • ICTRFN8180A Analyse a mobile network system • ICTRFN8181A Analyse a satellite communications system • ICTTEN8194A Analyse a telecommunications switching network • ICTTEN8195A Evaluate and apply network security • ICTTEN8196A Evaluate and apply digital signal processing to communications system. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

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RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Functions may include:	• cos(x) • exponential(x) • ln(1+x) • sin(x).

Complex trigonometric ratios refer to:	• analysing the elements of a vector 'term by term' with the operations of division, multiplication and exponentiation
	• analysing the series expansion of functions commonly used in telecommunications engineering problems
	• applying series expansion using Taylor and Maclaurins forms to simple formulae:
	  • polynomials
	  • exponentials
	  • logarithmic functions
	  • trigonometric functions
	• calculating a best fit polynomial of up to degree five for a set of at least ten data points using a least square method in software
	• calculating a line of best fit and plot the result given a set of at least ten data points using a least square method in software
	• complex trigonometric ratios:
	  • cosh functions
	  • sinh functions
	  • tanh functions
	• interpolating data for a curve of best fit
	• performing calculations with a simulation package.

Matrices and determinants refer to:	• analysing row and column vectors as a special case of a general matrix • applying symbolic software to perform standard calculations on a matrix • calculating the co-factor of a determinant given the desired row and column • calculating the eigen values and eigen vectors of a square matrix of three dimensions • calculating the numerical and symbolic addition and/or subtraction of commensurable matrices • calculating the numerical and symbolic inner product of

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RANGE STATEMENT	
	commensurable row and column vectors • calculating the numerical and symbolic product of a matrix by a scalar • calculating the numerical product of a pair of commensurable matrices • calculating the numerical value for the inverse of a square matrix • converting a set of linear equations to Matrix form.
Standard calculations may include:	• determinant of a square matrix with up to 4x4 dimension • eigen values and eigen vectors of a square matrix with up to 4x4 dimension • solution of up to four simultaneous equations • symbolic product of a pair of commensurable matrices with outer dimensions not exceeding four.
Trigonometric functions include:	• cos • cosh • sin • sinh • tan • tanh.

Operations on complex numbers refer to:	• analysing the polar and rectangular forms of complex numbers
	• calculating complex variables with basic arithmetic operations
	• calculating the complex roots of polynomials with real coefficients up to third order
	• calculating the results of operations on complex numbers using complex forms of trigonometric functions
	• deriving the results for the complex operations of square root and multiple roots for up to sixth order
	• operations on complex numbers:
	  • multiple roots
	  • powers
	  • square roots
	• solving an engineering problem using euler equation.

Integral and differential calculus refer to:	• calculating derivatives and integrals of a single variable using standard forms and with symbolic software • calculating maximum and minimum values of a differential function • calculating partial derivatives using standard forms of differentiation • calculating the numerical differential of an equation from the sample interval • calculating the numerical integration of an equation given the

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RANGE STATEMENT	
	sample interval • differentiating implicitly defined functions by applying the chain rule and software solution • integrating and evaluating double integrals that use standard forms and substitution methods • integrating equations by applying integration methods.

Ordinary differential equations (***ODE***) refer to:	• solving first order ODE using standard methods
	• solving first and second order ODE equations using various ODE solutions methods:
	  • applying software
	  • numerical plot with constant coefficients
	  • numerical solutions
	  • trial exponential solutions determining the unknown constants.

Laplace transforms refer to:	• calculating Laplace transforms of relevant equations using standard forms:
	  • exponential equations
	  • telecommunications related equations with polynomials up to degree two
	  • trigonometric equations
	• calculating partial fraction expansion of linear equations of one variable with constant coefficients of second order degree or less
	• calculating the inverse Laplace transform by arrangement, into standard forms
	• solving a telecommunications related first order ODE using Laplace transforms numerically and with symbolic software.

Algorithmic control structures may include:	• multi-way selection (switch) • post-test repetition (repeat until) • pre-test repetition (Do While) • program fragments that use algorithmic control structures • program to output calculated results • program to request data by command line prompting • sequence • solution expressed in an acceptable algorithmic form • two-way selection (IF then Else) • well structured program to obtain the solution to a given engineering problem.
Simulated calculations may include:	• manipulation of diary files • plotting the results of calculations with equations: • exponential

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RANGE STATEMENT	
	• logarithmic • trigonometric functions • script to repeat previous calculations • simplification and expansion of symbolic equations and arithmetical expressions • symbolic variables, constants and equations • variable browsers window and command history screen • variables to store appropriate data for problem solving.
Engineering solutions may include:	• antenna performance and propagation evaluation • capacity predictions • data analysis • digital signal processing • forecasting • queuing systems • radio networks • traffic engineering.
Simple control system is based on:	• delay elements • feedback loop.
Queuing system includes:	• fixed arrival times • fixed processing delay • single queue • single server.
Stochastic system includes:	• random arrival times • random processing delay • single queue • single server.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units	

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Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

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ICTWHS2170B Follow work health and safety and environmental policies and procedures

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0*. It is based on the superseded equivalent ICTWHS2170A.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 2.0*.

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to follow safe work practices and environmental policy in managing telecommunications workplace tasks. It involves awareness of the safe handling of active optical fibre, cabling, laser sources and equipment.

The unit requires the ability to apply work health and safety (WHS) requirements, the basic principles of risk management, and prevention of injury and illness on construction sites involving the NBN in particular, and all other locations where telecommunications work is performed.

This unit includes the ability to recognise asbestos hazards and take steps to minimise associated risks. Removal of asbestos is a licensed activity covered by the units of competency CPCCDE3014A Remove non-friable asbestos.

Some cabling and installation work may fall within the definition of construction work. People entering the construction site are required to complete the general induction training program specified by the National Code of Practice for Induction Training for Construction Work (Australian Safety Compensation Council, May 2007), sometimes referred to as the 'White Card'.

The unit CPCCOHS1001A Work safely in the construction industry from the CPC08 Construction, Plumbing and Services Training Package fulfils this requirement.

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Application of the Unit

The unit applies to field officers deploying broadband access networks using optical technologies. They combine technical skills with specific WHS skills to work safely on live systems.

The unit also applies to telecommunications staff working under supervision in a technical environment. This includes school-based workers, entry-level workers, trainees and apprentices.

Licensing/Regulatory Information

Licensing requirements will apply to this unit of competency depending on the regulatory requirements of each jurisdiction. Users should confirm requirements with the relevant federal, state or territory authority.

Note: The terms occupational health and safety (OHS) and WHS are equivalent and generally either can be used. Western Australian and Victorian legislation uses OHS. Commonwealth, NSW, Queensland, Northern Territory, Tasmania and South Australia legislation uses WHS.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	**Performance Criteria**
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

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Elements and Performance Criteria

1. Apply WHS regulatory requirements	1.1 Identify ***WHS requirements*** relevant to own work, role and responsibilities and comply with ***safe work practices*** 1.2 Apply ***duty of care requirements***
2. Follow workplace procedures for identifying hazards and using control measures to control risk	2.1 Identify and report ***common construction hazards*** in the work area to ***designated personnel*** according to ***workplace procedures*** 2.2 Identify and follow WHS requirements, workplace procedures and work instructions to ***control hazards and risks*** 2.3 Comply with safe work practices and ***principles of risk management*** 2.4 Implement duty of care requirements 2.5 Complete ***job safety analysis*** (JSA) ***sheet or safe work method statement*** (SWMS) according to work requirements, including ***hazard identification*** and ***risk assessment*** 2.6 Use and complete checks to ***personal protective equipment*** according to work requirements 2.7 ***Assess and test for harmful gases*** associated with the workplace
3. Identify safety requirements for work with optical fibre equipment	3.1 Identify safe work practices when handling optical fibre, lasers and optical connectors according to relevant ***Australian standards*** 3.2 Identify safe work practices when handling and disposing of chemical waste
4. Identify WHS communication and reporting processes	4.1 Identify ***WHS communication processes, information and documentation*** 4.2 Identify the role of ***designated WHS personnel*** and ***safety signs and symbols*** 4.3 Identify procedures and ***relevant authorities*** for reporting hazards, ***incidents*** and injuries
5. Identify WHS incident response procedures	5.1 Identify ***general procedures for responding to incidents and emergencies*** 5.2 Identify procedures for accessing first aid 5.3 Identify and demonstrate requirements for selecting and using relevant personal protective equipment 5.4 Identify ***fire safety equipment***
6. Contribute to WHS	6.1 Discuss WHS and environmental issues with designated

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and environmental issues in the workplace	personnel according to workplace procedures, and relevant WHS policies and ***environmental requirements*** 6.2 Contribute to ***participative arrangements*** for WHS and environmental management in the workplace within organisational procedures, scope of responsibilities and own competencies 6.3 Record and report WHS issues, risks and hazards to designated personnel
7. Identify and respond to minor traffic management	7.1 Assess ***traffic safety*** requirements of the general location with respect to regulatory and organisational requirements 7.2 Identify a safe work zone around vehicle and work space using traffic cones and signs according to regulatory requirements 7.3 Identify and respond to changed traffic conditions
8. Identify and respond appropriately to a confined space	8.1 Identify a ***confined space*** in line with regulatory or organisational guidelines 8.2 Refer the telecommunications work in the identified confined space to appropriate trained personnel
9. Identify and respond appropriately to asbestos hazards	9.1 Identify ***asbestos hazards*** or their likelihood 9.2 ***Respond to asbestos hazards*** or their likelihood 9.3 Report identified or suspected asbestos hazards to designated personnel according to workplace procedures

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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
  - ask effective questions and clarify requirements
  - listen to, and liaise with, relevant personnel on technical and operational matters
  - raise and report WHS matters, discuss and relay WHS information to others
  - explain legislative requirements and principles of risk management, safety signs and symbols and common hazards in relation to own work
- literacy skills to:
  - interpret technical documentation and standards
  - incorporate technical language into written tasks, such as reporting on recommendations to minimise hazards and injury
- numeracy skills to interpret technical data, such as specifications of laser operations
- problem-solving skills to use methodology that minimises risk
- research skills to access technical information and sources to understand and report on safety requirements
- safety awareness skills to:
  - apply required precautions and action to minimise, control or eliminate hazards associated with work activities
  - recognise asbestos and the likelihood of asbestos in work area
  - select and use required personal protective equipment that conforms to industry and WHS standards
  - work systematically with required attention to detail without injury to self and others, and damage to goods or equipment
  - select and use appropriate methods for laser handling.
  -

Required knowledge

- applicable federal, state and territory WHS procedures, regulations, standards, codes of practice and industry standards and guidance notes relevant to own workplace, role and responsibilities
- differences between federal, state and territory WHS legislation and regulations
- common construction hazards
- asbestos hazards and their potential risk for workers and the community
- common construction hazards and common hazards in relation to own work
- general construction work activities that require licences, tickets or certificates of competency
- environmental control processes:
  - air quality management
  - disposal and handling of hazardous and dangerous substances
  - noise pollution
  - safe disposal of fibre offcuts

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  - stormwater and materials spillage
  - waste disposal
- WHS responsibilities and rights of duty holders/workplace parties under environmental and WHS regulations and codes of practice, including:
  - persons in control of construction work or projects
  - employers and self-employed persons
  - persons conducting a business or undertaking (PCBUs) and their officers
  - supervisors
  - employees
  - designers
  - inspectors
  - manufacturers and suppliers
- optical fibres and equipment:
  - hazards relating to handling of optical fibre and laser light source in the workplace
  - injuries:
    - damage to retina from lasers
    - damage to lungs from inhalation of fibre offcuts and particles
    - needle stick injury from fibres and offcuts
  - laser warning signs and labels relating to optical fibre components and equipment
  - safety requirements when handling and working with:
    - devices
    - laser light sources
    - optical fibre connectors
    - optical fibres
    - patch cords
- own responsibilities to comply with safe work practices including those relating to:
  - asbestos hazards
  - confined spaces
  - housekeeping
  - identification of hazards
  - preventing bullying or harassment
  - smoking
  - use of amenities
  - use of drugs and alcohol
- principles of risk management for construction work, including:
  - hazard identification
  - risk assessment and control
- ways in which WHS is managed in the workplace, and activities required under WHS legislation, including:
  - hazard identification
  - hazards that exist in the workplace
  - WHS instruction
  - preferred order of ways to control risks (hierarchy of control)
  - risk assessment and controls
  - role of WHS committees and representatives

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    - training and provision of WHS information
    - types of common personal protective equipment and fire safety equipment
    - types of WHS information and documentation
- workplace environmental and WHS procedures relevant to the work being undertaken, including procedures for:
    - designated personnel responsible for WHS
    - employee/worker participation in WHS management
    - general first aid response requirements
    - general workers' compensation and injury management requirements
    - meaning of WHS symbols found on signs and labels in the workplace
    - raising WHS issues
    - recognising and reporting on:
        - accidents
        - asbestos hazards
        - dangerous occurrences
        - emergencies
        - hazards
        - incidents
        - injuries
        - near misses
    - responding to:
        - accidents
        - emergencies
        - evacuation procedures
        - fires
        - hazards
        - incidents
        - injuries
- work operations to control risks
- traffic control for a single vehicle
- risks associated with confined spaces and appropriate responses.

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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • recognise and report hazards to designated personnel • follow workplace procedures necessary to control risks in the workplace • identify and apply safe handling procedures for optical fibres and laser sources • identify and respond appropriately to asbestos, traffic and confined spaces hazards in the workplace.
Context of and specific resources for assessment	Assessment must ensure access to: • relevant WHS Acts, regulations and codes of practice • WHS implementation resources, such as sample forms, signs and procedures • personal protective equipment • first aid equipment • fire safety equipment • organisational WHS policies and procedures • relevant work areas for identification of hazards and control measures. • optic fibre cabling and equipment.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate applying safety aspects to the handling of optical fibres and lasers • direct observation of the candidate following or participating in common WHS workplace procedures • oral or written questioning to assess knowledge of WHS concepts and applications • evaluation of written reports on hazards and safety recommendations.

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Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

WHS requirements include:	• applicable and relevant national safety standards • construction industry WHS standards and guidelines • federal, state and territory WHS legislation, regulations, standards and codes of practice • industry standards, guidance notes, guidelines, Australian standards and other documents applicable to own workplace, work, role and responsibilities • National Code of Practice for Induction Training for Construction Work • requirements for licences, tickets and certificates of competency • responsibilities, duties and rights of duty holders and workplace parties (including health and safety representatives, committees and supervisors) under environmental and WHS Acts and regulations.

Safe work practices may relate to:	• access to site amenities, including:
	  • drinking water
	  • toilets
	• appropriate warning labels on cabinets and enclosures
	• avoiding contact with hazardous chemicals, including not inhaling or swallowing such materials
	• avoiding drugs and alcohol at work
	• being aware of how to respond to potential accidents
	• ensuring manufacturer's warnings and instruction labels in relation to the laser product are not damaged or obscured during installation
	• general requirements for:
	  • safe use of plant and equipment
	  • use of personal protective equipment and clothing
	• housekeeping to ensure a clean, tidy and safe work area
	• no hazardous chemicals, including fibre particles and solvents, left on site at the completion of the work
	• preventing bullying and harassment
	• relevant Australian standards relating to WHS
	• specific organisational safety requirements

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	• smoking in designated areas only • storing and removing debris • using a wet cleaning process and making sure all solvent residues are disposed of according to environmental policy • warning labels used in conjunction with laser and optical fibre systems.

Duty of care requirements relate to:	• legal responsibilities, duties and rights of duty holders and workplace parties as specified in WHS Acts, regulations and codes of practice
	• own duties to comply with safe work practices:
	  • activities that require licences
	  • tickets
	  • certificates of competency
	• specific and general duties and responsibilities of particular individuals, workplace parties and others (as prescribed in applicable federal, state and territory WHS legislation and regulations), including:
	  • construction and other supervisors
	  • construction and other workers
	  • designers
	  • employers and self-employed persons
	  • PCBUs and officers
	  • WHS inspectors
	  • manufacturers, importers, suppliers, installers and commissioners
	  • persons in control of the work site
	  • subcontractors.

Common construction hazards may include:	• confined spaces • electricity • excavations, including trenches • falling objects • hazardous chemicals and dangerous goods • hot and cold working environments • manual handling • noise • operation of plant and equipment • traffic and mobile plant • unplanned collapse • ultraviolet (UV) radiation • working at heights.
Designated personnel	• managers • PCBUs and officers

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may include:	• WHS personnel
	• worker health and safety representatives
	• other persons authorised or nominated by the organisation or industry to:
	  • approve specified work
	  • direct specified work
	  • inspect specified work
	  • perform specified work
	• supervisors
	• team leaders.

Workplace procedures may include:	• risk assessment
	• worker consultation and participation
	• hazard control
	• emergency responses to:
	  • accidents
	  • fires
	  • other emergency incidents and events
	• identifying hazards
	• reporting WHS issues
	• resolving WHS issues
	• using personal protective equipment.

Measures for controlling hazards and risk may include:	• administrative controls • elimination • engineering controls • isolation • personal protective equipment • substitution.

Hazards may include:	• activating equipment without notifying other staff who may be working remotely on the network
	• hazardous chemicals, including:
	  • cleaning alcohol and other solvents
	  • epoxy resins and chemicals that cause cancer, allergies or that can damage health in any way
	• environmental hazards:
	  • air pollution
	  • damage to natural or heritage precincts
	  • dangerous gases, heavy or noxious metals pollution, release of hydrochlorofluorocarbons (HCFC)
	  • ground water contamination
	  • noise
	  • petrochemical spillage

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	• flammable cleaning chemicals fluids and solvents
	• fibre offcut damage to eyes and skin
	• health hazards, including:
	  • hazardous chemicals and dangerous goods
	  • handling of optic fibres and lasers
	  • infective agents, including viruses and bacteria
	  • risk of sustained injury from repetitive tasks
	• inhalation of fibre offcuts and particles from vacuum cleaning of work site
	• laser damage to eyes
	• safety hazards:
	  • manual handling (lifting, biomechanical)
	  • tasks such as welding
	  • working at heights
	• radio frequency (RF) radiation.

Principles of risk management include:	• identifying hazards • assessing the risks involved • worker participating in, and consulting on, all risk management activities • consulting and reporting to ensure involvement of relevant workers • controlling risks • monitoring the effectiveness of controls.

Job safety analysis sheet or safe work method statement may include:	• sheets to record the steps in the risk management process:
	  • identification
	  • assessment
	  • control
	  • monitoring
	• primary application of assessment
	• as specified in workplace procedures, policies and processes.

Hazard identification includes:	• checking equipment and work area:
	  • before work commences
	  • during work
	• housekeeping
	• reviewing accident or incident records
	• workplace inspections
	• as specified in workplace procedures, policies and processes

Risk assessment	• a scale: • low

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includes:	• medium • high • awareness of likelihood and consequence factors • JSA • as specified in workplace procedures, policies and processes.
Personal protective equipment may include:	• breathing apparatus: • dust masks • respirators • clothing: • boots and other safety footwear • gloves • high visibility retro reflective vests • overalls • protective jackets or pants for preparing, cutting or jointing optical fibres • aprons • arm guards • eye protection: • protective eyewear designed specifically for laser • goggles • face and head protection: • face masks • helmets and hard hats • hearing protection • protective, well-fitting clothing • UV protective clothing and sunscreen • radiation detectors.
Assessing and testing for harmful gases include:	• using gas detection equipment • reporting and responding to a positive test for gases in line with organisational guidelines • following workplace procedures and complying with legislative and regulatory requirements.
Australian standards may include:	• Australian Communications Industry Forum (ACIF) standards and codes • Australian Communications and Media Authority (ACMA) standards TS 14 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004

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	• AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations • Communications Cabling Manual (CCM) Volume 1 • Environmental Protection Acts • International Standards ISO 9000 and 9001 • International Telecommunications Union (ITU) recommendations • WHS Acts and relevant codes and standards • road and traffic control legislation and codes • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006 • Telecommunications Act and relevant codes.
WHS communication processes may include:	• discussions with worker health and safety representatives • processes for raising WHS issues • toolbox talks • WHS meetings • WHS notices, newsletters, bulletins and correspondence • WHS participative arrangements • workplace consultation relating to WHS issues and changes.
WHS information and documentation may include:	• accident and incident reports • Australian standards • construction documentation and plans • emergency information contact • evacuation plans • guidance notes • job safety analyses • labels • proformas for reporting hazards, incidents and injuries • reports of near misses and dangerous occurrences • risk assessments • safe work method statements • safety data sheets (SDS) • safety meeting minutes • site safety inspection reports • WHS Acts, regulations and other codes of practice.
Designated WHS	• first aid officers • WHS committee members

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personnel may include:	• WHS representatives • supervisors.

Safety signs and symbols may include:	• emergency information signs:
	  • equipment
	  • exits
	  • first aid
	• fire signs and location of fire alarms and fire fighting equipment
	• hazard, danger and warning signs
	• regulatory signs:
	  • mandatory
	  • limitation or restriction
	  • prohibition
	• safety tags and lockout:
	  • danger tags
	  • out of service tags.

Relevant authorities may include:	• emergency services:
	  • ambulance
	  • emergency rescue
	  • fire brigade
	  • police
	• supervisor
	• WHS regulatory authority.

Incidents may include:	• accidents resulting in personal injury or damage to property
	• near misses or dangerous occurrences which do not cause injury but may pose an immediate and significant risk to persons or property, and need to be reported so that action can be taken to prevent recurrence, for example:
	  • breathing apparatus malfunctioning to the extent that the user's health is in danger
	  • collapse of the floor, wall or ceiling of a building being used as a workplace
	  • collapse or failure of an excavation more than 1.5 metres deep, including any shoring
	  • collapse or partial collapse of a building or structure
	  • collapse, overturning or failure of the load bearing of any scaffolding, lift, crane, hoist or mine-winding equipment
	  • damage to or malfunction of any other major plant
	  • electric shock
	  • electrical short circuit, malfunction or explosion

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	• fire or escape of gas, hazardous substance or steam • any other unintended or uncontrolled incident or event arising from operations carried on at a workplace.

General procedures for responding to incidents and emergencies may include:	• basic emergency response:
	  • keep calm
	  • raise alarm
	  • obtain help
	• evacuation
	• notification of designated WHS personnel and authorities
	• referring to site emergency plans and documentation
	• when and how to notify emergency services.

Emergencies may include:	• chemical spill • fire • injury to personnel • structural collapse • toxic and flammable vapours emission • vehicle and mobile plant accident.
Fire safety equipment may include:	• breathing apparatus • fire blankets • fire fighting equipment.
Environmental requirements must include:	• clean-up management • dust management • noise management • waste management.
Participative arrangements may include:	• arrangements for documenting, communicating and following up requests and suggestions relating to WHS issues • arrangements or processes for raising and communicating WHS concerns • electing worker health and safety representatives • informal WHS meetings • planning committees • purchasing committees • WHS committees • WHS reports and other processes for advising workers on WHS issues and matters.
Traffic safety applies to safety of:	• pedestrians passing an area where work is being conducted • vehicles passing an area where work is being conducted • workers working adjacent to traffic.
Confined spaces applies to:	• spaces clearly labelled as confined spaces • spaces that meet the general specifications for a confined

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	space.
Asbestos hazards may be found in:	• corrugated asbestos roofing • eaves of houses • meter boxes • pit and pipe infrastructure • wall cladding.
Respond to asbestos hazards may include:	• notifying designated personnel and authorities • closing the worksite to further activity • barricading the work area • avoiding any disturbance of the work area • exercising a duty of care to self, fellow workers and the public.

Unit Sector(s)

Telecommunications - Work health and safety

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ICT Information and Communications Technology

Modification History

Release Number	Release Date	Comments
Release 1	March 2015	Primary release of restructured Training Package. This release of ICT Information Communications Technology Training Package Version 1.0. contains; 30 qualifications, 27 skill sets and 397 native units of competency (comprising 397 units updated to meet Standards for Training Packages) and 106 imported units. ICT80115 – Graduate Certificate in Information Technology and Strategic Management (updated to meet AQF Requirements) ICT80215 – Graduate Certificate in Information Technology Sustainability (updated to meet AQF Requirements) ICT80415 – Graduate Diploma in Telecommunications Network Engineering (updated to meet AQF Requirements) ICT80315 – Graduate Certificate in Telecommunications - added ICT80515 – Graduate Diploma of Telecommunications and Strategic Management - added

Credit Arrangements

Links

Companion volumes available from the IBSA website:
http://www.ibsa.org.au/companion_volumes - http://www.ibsa.org.au/companion_volumes

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ICTSS00031 Application Development Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for working as applications programmers and software development specialists.

Pathways Information

This skill set provides credit towards ICT50714 Diploma of Software Development.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTPRG501 Apply advanced object-oriented language skills
ICTPRG505 Build advanced user interface
ICTPRG506 Design application architecture
ICTPRG507 Implement security for applications
ICTPRG523 Apply advanced programming skills in another language

Target Group

This skill set is for persons who are able to work as application programmers and software developers.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a software development specialist.

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ICTSS00032 Basic Application Development Programmer Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for working as basic applications programmers using a range of programming languages

Pathways Information

This skill set provides credit towards ICT40514 Certificate IV in Programming.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTPRG406 Apply introductory object-oriented language skills
ICTPRG413 Use a library or pre-existing components
ICTPRG414 Apply introductory programming skills in another language
ICTPRG418 Apply intermediate programming skill in another language
ICTPRG527 Apply intermediate object-oriented language skill

Target Group

This skill set is for persons who are able to work as basic application programmers.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a basic application programmer.

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ICTSS00033 Basic Computer Hardware and System Troubleshooting Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for troubleshooting basic computer hardware and system problems across a variety of industry sectors.

Pathways Information

This skill set provides credit towards ICT20114 Certificate II in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

BSBWHS201 Contribute to health and safety of self and others
ICTICT201 Use computer operating systems and hardware
ICTSAS201 Maintain inventories for equipment, software and documentation
ICTSAS205 Maintain ICT system integrity
ICTSAS206 Detect and protect from spam and destructive software
ICTSAS207 Protect and secure information assets
ICTSAS208 Maintain ICT equipment and consumables
ICTSAS209 Connect and use a home based local wireless network

Target Group

This skill set is for persons wanting to trouble shoot basic computer hardware and system problems, and work safely across a variety of industries.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and BSB Business Services Training Packages meet competency requirements for basic computer hardware and system troubleshooting.

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ICTSS00034 Basic Web Development Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set provides the requirements to meet competency requirements for skills in reviewing, developing and maintaining a simple websites.

Pathways Information

This skill set provides credit towards ICT30114 Certificate III in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

BSBEBU401 Review and maintain a website
ICTWEB302 Build simple websites using commercial programs
ICTWEB403 Transfer content to a website using commercial packages

Target Group

This skill set is for persons wanting to develop and maintain a basic website.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and BSB Business Services Training Packages meet competency requirements for skills in developing and maintaining a simple website.

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ICTSS00035 Certified IT Network Enterprise, Security or Server Administrator Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for the installation, configuration and administration of enterprise security systems, servers and networks.

Pathways Information

This skill set provides credit towards ICT40414 Certificate IV in Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK406 Install, configure and test network security
ICTNWK403 Manage network and data integrity

Target Group

This skill set is for persons who are able to work as certified IT enterprise, security or server administrators.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in administering security, servers or enterprise networks.

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ICTSS00036 Certified Network Associate Technology Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements at an associate level for managing, troubleshooting networks, routers and switches

Pathways Information

This skill set provides credit towards ICT50414 Diploma of Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK529 Install and manage complex ICT networks
ICTNWK506 Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network
ICTNWK507 Install, operate and troubleshoot medium enterprise routers
ICTNWK508 Install, operate and troubleshoot medium enterprise switches

Target Group

This skill set is for persons who are able to work as certified network associate technology specialists.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for associate level skills in networking.

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ICTSS00037 Certified Network Professional Specialist - Voice and Wireless Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills in working as a network professional specialising in wireless and voice networks.

Pathways Information

This skill set provides credit towards ICT60214 Advanced Diploma of Network Security.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK605 Design and configure secure integrated wireless systems
ICTNWK606 Implement voice applications over secure wireless networks
ICTNWK607 Design and implement wireless network security

Target Group

This skill set is for persons who are able to work as certified network professional specialists – voice and wireless.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a network professional specialising in voice and wireless networks.

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ICTSS00038 Certified Network Professional Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills in working as a network specialist planning, configuring and troubleshooting network and internetwork solutions.

Pathways Information

This skill set provides credit towards ICT60214 Advanced Diploma of Network Security.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK603 Plan, configure and test advanced internetwork routing solutions
ICTNWK604 Plan and configure advanced internetwork switching solutions
ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks

Target Group

This skill set is for persons who are able to work as certified network professional specialists.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a network professional.

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ICTSS00039 Certified Networking Technician Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills in working as a technician specialising in small enterprise networks, wireless and installation and configuration of networking solutions.

Pathways Information

This skill set provides credit towards ICT60514 Advanced Diploma of Computer Systems Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK405 Build a small wireless local area network
ICTTEN4199A Install, configure and test a router

Target Group

This skill set is for persons who are able to work as certified network technicians.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and ICT10 Integrated Telecommunications Training Packages meet competency requirements for technical skills in networks.

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ICTSS00040 Certified Security and Architect Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills in managing complex ICT security and network architecture solutions.

Pathways Information

This skill set provides credit towards ICT50414 Diploma of Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK529 Install and manage complex ICT networks
ICTNWK503 Install and maintain valid authentication processes
ICTNWK511 Manage network security

Target Group

This skill set is for persons who are able to work as certified security and architect technology specialists.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working with security and network architecture.

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ICTSS00041 Certified Technician or Technology Specialist - Infrastructure Configuration Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills as a technician to design, build, test and maintain an ICT security and network architecture solution.

Pathways Information

This skill set provides credit towards ICT50414 Diploma of Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK505 Design, build and test a network server
ICTNWK503 Install and maintain valid authentication processes

Target Group

This skill set is for persons wanting to gain digital literacy skills in the use of a personal computer, software applications and digital devices.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in configuring infrastructure.

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ICTSS00042 Certified Technology Specialist - Graphical User Interfaces Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills as a technician specialising in the configuration and management of graphics user interfaces.

Pathways Information

This skill set provides credit towards ICT40414 Certificate IV in Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK403 Manage network and data integrity
ICTNWK408 Configure a desktop environment

Target Group

This skill set is for persons who are able to work as graphical user interface (GUI) certified technology specialists.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in developing and maintaining GUIs.

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ICTSS00043 Certified Web Design Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills as a technician in the design, construction, testing and maintenance of web sites.

Pathways Information

This skill set provides credit towards ICT40314 Certificate IV in Web-Based Technologies.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTWEB409 Develop cascading style sheets
ICTWEB410 Apply web authoring tool to convert client data for websites
ICTWEB411 Produce basic client-side script for dynamic web pages
ICTWEB412 Produce interactive web animation
ICTWEB414 Design simple web page layouts

Target Group

This skill set is for persons who are able to work as website designers.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a website designer.

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ICTSS00044 Computing and Application Fundamentals Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills at a foundation level for the safe use of an operating system and basic applications software.

Pathways Information

This skill set provides credit towards ICT20114 Certificate II in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

BSBWHS201 Contribute to health and safety of self and others
ICTICT201 Use computer operating systems and hardware
ICTICT203 Operate application software packages
ICTICT210 Operate database applications

Target Group

This skill set is for persons wanting to use basic information and communications technology (ICT) and application software and work safely in any industry.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and BSB Business Services Training Packages meet competency requirements for basic use of computers and applications.

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ICTSS00045 Computing Fundamentals Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills as a technician to design, build, test and maintain an ICT security and network architecture solution.

Pathways Information

This skill set provides credit towards ICT20114 Certificate II in Information, Digital Media and Technology

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

BSBWHS201 Contribute to health and safety of self and others
ICTICT201 Use computer operating systems and hardware
ICTICT203 Operate application software packages
ICTWEB201 Use social media tools for collaboration and engagement

Target Group

This skill set is for persons wanting to use basic information and communications technology (ICT) skills and work safely in any industry.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and BSB Business Services Training Packages meet basic competency requirements for basic ICT skills.

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ICTSS00046 Digital Literacy - eCitizen Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for foundation skills in personal computing.

Pathways Information

This skill set provides credit towards ICT10114 Certificate I in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTICT101 Operate a personal computer
ICTICT102 Operate word-processing applications
ICTICT103 Use, communicate and search securely on the internet

Target Group

This skill set is for persons wanting to gain basic digital literacy skills in using a personal computer.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for using a personal computer.

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ICTSS00047 Digital Literacy Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for a broad range of digital literacy skills including the use of basic computing, web searching and basic applications software.

Pathways Information

This skill set provides credit towards ICT10114 Certificate I in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTICT101 Operate a personal computer
ICTICT102 Operate word-processing applications
ICTICT103 Use, communicate and search securely on the internet
ICTICT105 Operate spreadsheet applications
ICTICT106 Operate presentation packages

Target Group

This skill set is for persons wanting to gain digital literacy skills in the use of a personal computer, software applications and digital devices.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for digital literacy.

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ICTSS00048 Hardware Technician Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements for skills as a basic technician for the installation and configuration of hardware for clients.

Pathways Information

This skill set has been designed for individuals who wish to meet competency requirements for skills as a basic technician for the installation and configuration of hardware for clients.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTICT302 Install and optimise operating system software
ICTICT303 Connect internal hardware components
ICTSAS307 Install, configure and secure a small office or home office network
ICTSAS301 Run standard diagnostic tests
ICTSAS305 Provide IT advice to clients
ICTSAS306 Maintain equipment and software

Target Group

This skill set is for persons who are able to work as hardware technicians, providing support in a range of ICT work areas and activities.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for support skills in hardware, software, operating systems and networks.

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ICTSS00049 Internetworking Systems Coordinator - Administrator Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as an internetworking systems coordinator or administrator.

Pathways Information

This skill set provides credit towards ICT60514 Advanced Diploma of Computer Systems Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK603 Plan, configure and test advanced internetwork routing solutions
ICTNWK605 Design and configure secure integrated wireless systems
ICTNWK610 Design and build integrated VoIP networks
ICTNWK611 Configure call processing network elements for secure VoIP networks
ICTNWK612 Plan and manage troubleshooting advanced integrated IP networks

Target Group

This skill set is for persons who are able to work as an internetworking systems administrator or coordinator.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as an internetworking coordinator or administrator.

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ICTSS00050 Rich Interactive Content Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements in interactive digital media.

Pathways Information

This skill set provides credit towards ICT30114 Certificate III in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

CUFDIG304A Create visual design components
ICTGAM301 Apply simple modelling techniques
ICTGAM302 Design and apply simple textures to digital art

Target Group

This skill set is for persons who are able to work with interactive digital media content.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and CUF07 Screen and Media Training Packages meet competency requirements for skills in interactive digital media.

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ICTSS00051 System and Hardware Plus Technician Skill Set

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This Skill Set has been designed for individuals who wish to meet competency requirements as a support technician in computer systems hardware.

Pathways Information

This skill set provides credit towards ICT40214 Certificate IV in Information Technology Support.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

BSBSUS301 Implement and monitor environmentally sustainable work practices
ICTSAS307 Install, configure and secure a small office or home office network
ICTICT421 Connect, maintain and configure hardware components
ICTSAS425 Configure and troubleshoot operating system software
ICTSAS426 Locate and troubleshoot ICT equipment, system and software faults
ICTICT401 Determine and confirm client business requirements

Target Group

This skill set is for persons who are able to work as a computer system and hardware technician.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and BSB Business Services Training Packages meet competency requirements for support skills in working as a computer system and hardware technician.

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ICTSS00052 System and Network Plus Technician Skill set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as a technician to manage a computer system network.

Pathways Information

This skill set provides credit towards ICT40214 Certificate IV in Information Technology Support.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTSAS307 Install, configure and secure a small office or home office network
ICTNWK401 Install and manage a server
ICTNWK404 Install, operate and troubleshoot a small enterprise branch network
ICTNWK406 Install, configure and test network security

Target Group

This skill set is for persons who are able to work as a computer system and network support technician.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a network technician.

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ICTSS00053 Virtualisation Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as a specialist in virtualisation for computers, software and systems.

Pathways Information

This skill set provides credit towards ICT50414 Diploma of Information Technology Networking

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK535 Install an enterprise virtual computing environment

Target Group

This skill set is for persons who are able to work in the area of hardware, software and system virtualisation.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in in developing hardware, software and system virtual networks.

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ICTSS00054 Visual Communications Specialist Skill Set

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This Skill Set has been designed for individuals who wish to meet competency requirements in visual communications specialist skills including video and digital images.

Pathways Information

This skill set provides credit towards ICT30114 Certificate III in Information, Digital Media and Technology.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

CUFDIG301A Prepare video assets
CUFDIG304A Create visual design components
ICTWEB303 Produce digital images for the web

Target Group

This skill set is for persons wanting to develop visual content for the web.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology and CUF07 Screen and Media Training Packages meet competency requirements for skills in developing visual components for websites.

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ICTSS00055 Website Administration Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as a website administrator.

Pathways Information

This skill set provides credit towards ICT40314 Certificate IV in Web-Based Technologies.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK409 Create scripts for networking
ICTWEB404 Maintain website performance
ICTWEB405 Monitor traffic and compile website traffic reports
ICTWEB406 Create website testing procedures
ICTWEB407 Conduct operational acceptance tests of websites
ICTWEB408 Ensure basic website security

Target Group

This skill set is for persons who are able to work as website administrators.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a website administrator.

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ICTSS00056 Enterprise Desktop Virtualisation Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as a professional desktop virtualisation technology specialists for business and enterprises.

Pathways Information

This skill set provides credit towards ICT60214 Advanced Diploma of Network Security.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTICT609 Lead the evaluation and implementation of current industry-specific technologies
ICTNWK615 Design and configure desktop virtualisation
ICTNWK616 Manage security, privacy and compliance of cloud service deployment
ICTPRG602 Manage the development of technical solutions from business specifications

Target Group

This skill set is for persons wanting to work as certified professional desktop virtualisation technology specialists.

Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a network professional specialising in desktop virtualisation technology.

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ICTSS00057 Enterprise Server Virtualisation Specialist Skill Set

Modification History

Release	Comments
Release 1	This skill set first released with ICT Information and Communications Technology Training Package Version 1.0.

Description

This skill set has been designed for individuals who wish to meet competency requirements as a specialist professional in server and computer virtualisation technologies.

Pathways Information

This skill set provides credit towards ICT50414 Diploma of Information Technology Networking.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

ICTNWK524 Install and configure network access storage devices
ICTNWK525 Configure an enterprise virtual computing environment
ICTNWK527 Manage an enterprise virtual computing environment
ICTNWK533 Configure and manage advanced virtual computing environments
ICTNWK534 Monitor and troubleshoot virtual computing environments
ICTNWK535 Install an enterprise virtual computing environment

Target Group

This skill set is for persons wanting to work as certified professional server virtualisation technology specialists.

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Suggested words for Statement of Attainment

These units of competency from ICT Information and Communications Technology Training Package meet competency requirements for skills in working as a network professional specialising in virtualisation technology.

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