



Australian Government

UEENEED123A Design and implement wireless LANs/WANs for internetworking systems

Release: 1

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Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This competency standard unit covers the design, implementation and performance monitoring of internetworking systems. It encompasses safe working practice, evaluating customer requirements, applying sound design principles, complying with regulation and standards, incorporation and advanced wireless LANs technologies and documentation of design and performance monitoring.

Note:

This unit applies to all aspects of Electrotechnology - engineering applications only. For general competencies related Information Technologies refer to the latest endorsed IT Training Package.

Application of the Unit

Application of the Unit 2)

This competency standard unit is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 5 or higher.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not

License to practice

3)

require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and the like.

Pre-Requisites

Prerequisite Unit(s)

4)

Competencies

4.1)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE1 01A Apply Occupational Health Safety regulations, codes and practices in the workplace

Literacy and numeracy skills

4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills

5)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit
Performance Criteria describe the required performance needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to design internetworking systems.	1.1 OHS processes and procedures for a given work area are obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Design brief for the advanced wireless LANs technologies is developed and documented in consultations with person(s) of higher authority.
	1.4 Work team/group is arranged of appropriately competent persons in accordance with skills required to meet work outcomes and organisation's established procedures.
	1.5 Activities are planned to meet scheduled timelines in consultation with others involved on the work.
	1.6 Strategies are implemented to ensure network development is carried out efficiently.
2 Design internetworking systems.	2.1 Internetworking system is designed to comply with design brief and consideration of economical and appropriately effective design solutions.
	2.2 Advanced wireless LANs technologies are included in the internetworking system design. (See Note 1)

ELEMENT	PERFORMANCE CRITERIA
	2.3 Internetworking system design includes specification of required media that is compliant with industry standards. 2.4 Internetworking system design is documented in accordance with organisation's policies and procedures. 2.5 Internetworking system design is presented and discussed with person(s) of higher authority. 2.6 Alterations to the internetworking system design resulting from the presentation/discussion are negotiated with person(s) of higher authority within the constraints of organisation's policy. 2.7 Final internetworking system design is documented and approval obtained from person(s) of higher authority.
3 Implement internetworking systems.	3.1 Activities are planned to meet scheduled timelines in consultation with others involved on the work. 3.2 Appropriate development tools and software are selected based on specified requirements and performance standard. 3.3 Knowledge of internetworking arrangements and protocols is applied to installing, configuring and testing advance wireless LANs technologies. 3.4 System malfunctions and performance issues are identified during testing and rectified using logical techniques drawing knowledge of internetworking arrangements and protocol. (See Note 2) 3.5 Approaches to issues/problems are analysed to provide most effective solutions. 3.6 Quality of work is monitored against personal performance agreement and/or established organizational or professional standards. 3.7 Final internetworking system design and implementation are documented in accordance

ELEMENT

PERFORMANCE CRITERIA

organisation's established procedures.

Note.

1. Wireless LAN technologies may include compliance with IEEE 802.11 standards, and frequency and channel usage, in-building and building-to-building WLANs and devices and appropriate antennas that meet mobility and throughput specifications, hardware set-up and software configuration of wireless products including security using WEP, WPA, and 802.1x protocols.
2. Performance issues may include using event logging, command-line utilities, and diagnostic tools

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and designing and implementing internetworking systems - wireless LANs/WANs.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-ED123A

Fundamentals of wireless security

Evidence shall show an understanding of fundamentals of wireless security to an extent indicated by the following aspects:

- T1 Wireless Standards
- T2 Wireless radio technologies
- T3 Wireless topologies
- T4 Network Interface Cards (NICs)
- T5 Access points
- T6 Wireless Bridges and routers
- T7 Antennas
- T8 Security
- T9 Application design and site survey preparation
- T10 Troubleshooting, management, monitoring and diagnostics
- T11 802.11 authentication and encryption methods
- T12 Wireless roaming
- T13 Wireless LAN network management software tools
- T14 Frequency interference
- T15 Emerging technologies

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UEE11”. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
 - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ; and
 - Demonstrate an appropriate level of skills enabling employment; and
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Design and implement internetworking systems – wireless LANs and WANs as described in 8) and including:
 - A Developing a design brief for advance wireless LAN technologies in an internetworking system design brief.
 - B Planning work activities including requirements for work team/group.

- C Designing internetworking system based on economic and effective solutions that meet with design brief requirements.
- D Detail technologies and media specifications used in the design of advanced wireless LANs technologies.
- E Documenting and presenting design for approval.
- F Implementing internetworking system design.
- G Identifying and rectifying system malfunctions.
- H Documenting internetworking installation and configuration activities.
- I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this competency standard unit.

Resources required to assess this unit are listed above in context of assessment', which should also be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

In addition to the resources listed above in context of and specific resources for assessment, evidence should show demonstrated competency in designing and implementing internetworking

systems – wireless LANs/WANs.

**Method of
assessment**

9.4)

This competency standard unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEED11 Design and implement internetworking systems
8A

UEENEED11 Design and implement internetworking systems —
9A advance routing

UEENEED12 Design and implement internetworking systems —
0A remote access

UEENEED12 Design and implement internetworking systems —
1A multi-layer switching

UEENEED12 Design and implement internetworking systems —
2A security

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This competency standard unit shall be demonstrated in relation to designing and implementing internetworking systems - wireless LANs/WANs between two Local Area Networks (LANs) to form a Wide Area Network (WAN) or a LAN and the Internet.

Generic terms are used throughout this Vocational Standard shall be regarded as part of the Range of Variables in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Computer Systems