



Australian Government

Department of Education, Employment and Workplace Relations

ICTITU5144A Test telecommunications network using virtual instruments

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to apply simulation techniques to telecommunication systems. 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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Application of the Unit

Application of the unit	Technical staff who work with optical communication systems apply the skills and knowledge in this unit.
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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.
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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
1. Plan simulation of hardware instruments	1.1. Arrange access to the site according to required procedure 1.2. Determine the specific applications for virtual instruments in telecommunication systems 1.3. Determine the features of virtual instruments applicable to telecommunication systems, including limitations of virtual instruments 1.4. Select a range of simple and complex virtual instruments applicable to telecommunication systems
2. Perform simulation techniques	2.1. Perform measurements on telecommunication systems using simple virtual instruments 2.2. Simulate and display the properties of a modulated signal with software generated instruments following enterprise occupational health and safety (OHS) processes and procedures 2.3. Simulate and display a data signal transmitted through a band-limited channel 2.4. Control virtual instruments using data bus operation
3. Analyse simulation measurements	3.1. Determine the conversion processes used in virtual instruments 3.2. Document the potential effect of a simulation algorithm on the readings taken 3.3. Analyse measurements in context of conversion process and simulation algorithm
4. Report measurement results	4.1. Prepare report on measurement results 4.2. Submit report to supervisor

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- research skills to source information on simulation techniques
- communication skills to:
 - liaise with internal and external personnel on technical and operational matters
 - relate to work associates, supervisors, team members and clients

REQUIRED SKILLS AND KNOWLEDGE

- literacy skills to:
 - interpret technical documentation such as equipment manuals, specifications and service orders
 - write reports using standard formats
- technical skills to use:
 - simulation techniques for measurements on telecommunication systems
 - software generated instruments to display basic communication signals
 - word processing and desktop research

Required knowledge

- applications of virtual instruments
- current and emerging developments in relation to virtual instruments
- familiarity with workplace and industry environment
- instrumentation principles and practices
- internet support services
- modulation methods, AM, FM and digital formats
- organisational policy and procedures
- sampling and data conversion processes
- virtual instrument features and benefits

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:

- interpret and use equipment and system manuals and specifications
- use latest virtual instrument test equipment
- simulate signals and systems using complex virtual instruments
- analyse results of simulation.

Context of and specific resources for assessment

Assessment must ensure:

- internet access to virtual instrument sites
- Electronic Workbench or similar software
- virtual instrument applications and media
- a workplace conducting operations that involve virtual instruments with support from a competent supervisor or mentor
- telecommunications equipment suitable for integrating projects.

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 of the candidate
- direct observation of the candidate carrying out measurements using virtual instruments
- evaluation of written report prepared by the candidate outlining conversion processes and analysis of test results.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:

- ICTOPN5122A Test the performance of specialised optical devices
- ICTOPN5123A Analyse and integrate specialised optical devices in the network
- ICTRFN5148A Test and measure cellular phone and

EVIDENCE GUIDE

	network equipment performance. 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**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.

Applications may include:

- automation systems
- complex electronic design
- development
- process control
- total systems simulation.

Features may include:

- accuracy
- adaptability
- aliasing
- bandwidth

RANGE STATEMENT	
	• cost • data control • portability • processing speed • resolution • sampling rates • size.
Range may include:	• optical time domain reflectometer • oscilloscope • simple multimeter • spectrum analyser.
Conversion processes may include:	• analog to digital • digital to analog.
Algorithm may include:	• calibration • Fast Fourier Transforms (FFT) • filtering • Laplace transforms.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units		

Competency field

Competency field	IT use
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