



Australian Government

ICTTEN431 Design a dense wavelength division multiplexing system

Release: 1

ICTTEN431 Design a dense wavelength division multiplexing system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

Application

This unit describes the performance outcomes, skills and knowledge required to design a dense wavelength division multiplexing (DWDM) system in optical networks.

It applies to telecommunications technical staff who design systems for installation of long haul or metropolitan area DWDM equipment.

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

Unit Sector

Telecommunications – Telecommunications Networks Engineering

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Obtain access to worksite safely and with authority from site owner	1.1 Obtain and review DWDM installation brief 1.2 Determine site access requirements 1.3 Notify parties if necessary to arrange site access and discuss DWDM installation requirements 1.4 Assess site-specific safety requirements and enterprise work health and safety (WHS) processes and procedures
2. Prepare to install design DWDM units	2.1 Survey location for DWDM installation and scope installation parameters 2.2 Identify suitable location for DWDM equipment racks

ELEMENT	PERFORMANCE CRITERIA
	2.3 Determine number and location of shelves and cards in racks 2.4 Determine capacity of optical distribution frames (ODFs), patching and network management system (NMS) connections for the installation 2.5 Determine power feed options
3. Design DWDM units and associated cabling	3.1 Design DWDM racks, including locations and layout 3.2 Examine standards, practices and requirements for designing DWDM systems 3.3 Design DWDM shelf and card positions from customer and manufacturer documents 3.4 Design supporting patch panel and jumpering schemes 3.5 Include appropriate ancillary equipment and connections in design specifications 3.6 Prepare detailed design drawings for racks, shelves and cards from manufacturer and carrier documents 3.7 Prepare detailed design drawings for patching, jumpering and power feeds from manufacturer and carrier documents
4. Review design for compliance with standards and legislation	4.1 Confirm DWDM installation design meets the brief 4.2 Review installation design to ensure compliance with requirements of federal, state and local regulations, relevant legislation, codes and standards

Foundation Skills

This section describes 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, 3.3, 3.6, 3.7, 4.1, 4.2	Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine design requirements
Writing	1.3, 3.1, 3.3-3.7	Prepares and produces dynamic material for a specific audience using clear and detailed language to convey explicit information, requirements and

		recommendations • Produces plans using industry-relevant terminology and recognised industry symbols
Oral Communication	1.3	• Uses 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
Numeracy	2.3-2.5, 3.1, 3.3, 3.4	• Uses highly-developed numeracy skills to interpret complex information, perform calculations and record outcomes for designs
Navigate the world of work	1.4, 3.2, 4.2	• Works independently or with others to make decisions to achieve organisation outcomes • Takes full responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation
Interact with others	1.3, 4.1	• 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, 1.4, 2.1-2.5, 3.1, 3.3, 3.6, 3.7, 4.1	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness • Makes critical decisions quickly and intuitively in complex situations, taking into consideration a range of variables • Applies systematic and analytical decision-making processes for complex and non-routine situations • Responds intuitively to problems requiring immediate resolution, drawing on past experiences to focus on the cause of a problem • 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

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ICTTEN431 Design a dense wavelength division multiplexing system	ICTTEN4246A Design a dense wavelength division multiplexing installations	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN431 Design a dense wavelength division multiplexing system

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Performance Evidence

Evidence of ability to:

- design a dense wavelength division multiplexing (DWDM) system and associated cabling according to plans and specifications
- design DWDM power and ground connections
- complete and confirm installation design report.

Note: If a specific volume or frequency 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 principles of operation of a DWDM
- recognise electrostatic discharge and apply work practices to minimise damage to equipment
- recognise and describe the function and types of optical fibre connectors and characteristics of optical fibre
- describe specific work health and safety (WHS) requirements that impact the safe inspection of optical connectors
- recognise and apply principles of safe measurement of optical power for laser transmission systems
- describe tools and ancillary equipment commonly used for DWDM systems
- recognise and describe common power wiring faults.

Assessment 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 networks engineering field of work and include access to:

- special purpose tools, equipment and materials
- a suitable site for DWDM equipment installation
- tools and equipment required for installation
- a range of optical fibres to suit the installation.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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