

1. Module details**Module name****Telecommunication Cables and Installation Methods****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 72 - 80 hours.

Module code

NUE191

Discipline code

Electrotechnology - 0703225.

2. Module purpose

This module provides the student with the knowledge and skills to identify telecommunication cables types, labelling, characteristics, and applications; hazards; install cable support systems; terminate cables to termination frames and outlets. Also it provides the knowledge of the various methods of hauling telecommunication cables in various situations.

3. Prerequisites

NBB02 Occupational Health and Safety
 NUE190 Telecommunications Standards and Regulations

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from NUEITAB.

5. Content**Telecommunication cable types, construction, characteristics and applications****Cable identification, labelling and documentation (plans and drawing)****Cable installation**

Hazards
 Cable damage prevention
 Cable dispensers

Building construction

Domestic buildings
 Commercial buildings

Fixing devices

Bracketed assemblies

Hard wall fixing devices
 Soft wall fixing devices
 Ties

Cable enclosures

Types
 Fixing
 Regulations

Distribution boxes and back mounts

Systems
 Termination Boundaries and devices

Electrical connections

Hazards
 Regulations

Cable preparation and terminations

Hauling mechanisms

Indoor Methods
 Outdoor Methods

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner’s development.

7. Learning outcome details

Learning outcome 1

Describe various telecommunication cable types, construction characteristics and applications.

Assessment criteria

1.1 Describe indoor, outdoor, underground, aerial, coaxial, optical fibre and other telecommunication cable types.

Learning outcome 2

- 1.2 Describe the characteristics of UTP and STP indoor cable; underground pair and quad cable, aerial pair and quad cable and integral bearer wire.
- 1.3 Explain the performance characteristics, bandwidth, and capacity of various telecommunication cables.
- 1.4 Define the applications of telephone, data, cable TV and broadband cable types.

Distinguish cable identification, labelling and documentation.

Assessment criteria

- 2.1 Describe minimum cabling identification and labelling requirements as specified in the relevant standards – TS008.
- 2.2 Describe the term cable and topology when choosing a range of cable applications
- 2.3 Describe the identification colour code for up to and including 100 pair indoor and outdoor cable.
- 2.4 Describe the minimum requirements for labelling and documentation as specified in the relevant standards - AS 3085.95 for backbone cabling, horizontal cabling, indoor and outdoor cabling and active communications equipment.
- 2.5 Identify various types of cables used and attached labelled devices in a building using premises plans, backbone cabling diagrams and schematic drawings

Learning outcome 3

Define cable installations and associated OH&S issues and methods of prevention of cable damage.

Assessment criteria

- 3.1 Identify hazard areas and methods of preventing cable damage such as, cable kinking, cable stretching, burning, crushing, bending radius, and sheath damage.
- 3.2 State potential hazards associated with poor clearances and segregation as defined by the relevant standard – TS009
- 3.3 Identify various cable dispensers such as, cable drums and cable spools.
- 3.4 Describe the Occupational Health and Safety precautions such as lifting and rolling drums, when handling cable.

Learning outcome 4

Identify different types of constructions in domestic and commercial buildings.

Assessment criteria

- 4.1 Describe the different types of domestic wall constructions.
- 4.2 Describe the different types of domestic roof constructions.
- 4.3 Identify the different types of wall construction in commercial buildings including riser shafts.
- 4.4 Describe the different types of floor and ceiling constructions in commercial buildings.
- 4.5 Identify potential hazards and solutions when working with the different types of constructions in domestic and commercial buildings.
- 4.6 Identify potential hazards and solutions when penetrating fire walls in a range of buildings with cables and cable support systems

Learning outcome 5

Describe and identify various fixing devices.

Assessment criteria

- 5.1 List the various fixing devices and describe their application.
- 5.2 Identify hazards when using various fixing devices.
- 5.3 Describe the Occupational Health and Safety precautions required in using fixing devices.

Learning outcome 6

Identify various types of cable enclosures, distribution boxes and backmounts utilised in telecommunication cabling installations.

Assessment criteria

- 6.1 Identify the various types of cable enclosures utilised in telecommunication cabling installations.
- 6.2 Describe the requirements of cable enclosures identified in the relevant standard – TS008.
- 6.3 List the requirements and specifications relating to the fixing of cable enclosures using the relevant standard.

	6.4	List the regulations and/or standards applicable to cable enclosures associated with fire rating, door clearance, access and clearance, locking and safety.
	6.5	Describe the requirements of cable distribution devices associated with insulation, frame and backmount earthing, terminations, mechanical integrity, link bar or strip insulation and fire resistance.
	6.6	Define the distribution box systems including CD/BD, FD and LD.
Learning outcome 7		Describe the different types of electrical connections.
Assessment criteria	7.1	Demonstrate the correct method of electrical connection using different types of terminals.
	7.2	Demonstrate the correct method crimping (crushing/insulation displacement) using different types of connectors and related tools.
	7.3	Define the safety precautions when soldering.
	7.4	Demonstrate the correct method of soldering an electrical connection.
	7.5	Identify the potential electrical hazards that may be present when carrying out connections
	7.6	State the regulations and standards applicable to electrical work
Learning outcome 8		Describe the requirements for cable preparation and terminations.
Assessment criteria	8.1	Demonstrate correct cabling stripping and fanning out to indicate relevant colour code.
	8.2	Describe the precautions necessary to maintain pair integrity.
	8.3	Identify appropriate tools required for stripping cable safely.
	8.4	Identify and prepare a range of cables, including multi pair and terminate on approved terminations and sockets.

Learning outcome 9	8.5 Identify and prepare a range of cables including one larger cable (20 pair or greater) and terminate on a Krone block or other approved device.
Assessment criteria	8.6 Identify correct tools for terminating IDS devices.
	Identify hauling mechanisms.
	9.1 Explain the purpose and application for various hauling mechanisms.
	9.2 Identify different indoor and outdoor hauling mechanisms.
	9.3 Describe various correct hauling methods.
	9.4 State the Occupational Health and Safety precautions when hauling.
	9.5 Define the precautions required when hauling with respect to cable damage.
8. Delivery of the module	
Delivery strategy	Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.
Resource requirements	Resources should be sufficient for students to carry out learning activities on an individual basis. This will require a range of support equipment and reference material.
	<i>Students will require access to the following reference material or their replacement:</i>
	<ul style="list-style-type: none"> • TS008 • TS009 • AS/NZS 1668 • AS1199 • AS 1670 • AS1851 • AS 2220 • AS/NZS 3000 series and related sub-standards • AS3902

- IS11801
- TSB67
- Telecommunications Act 1997 - overview
- The Building Code of Australia Volumes 1-3
- ACA's Cabling Provider Rules – Benchmark Cabler Competency Requirements - 2000
- Communication Cabling Manual BCL Package
- Certified Components List (CCL) or replacement
- Labelling

Specialised facilities and equipment required by the training provider include:

- Access to a range of industrial, commercial and domestic sites
- Range of cables and approved termination equipment
- Range of cable enclosure and support systems
- Certification and related documentation
- Range of fixing devices and associated safety systems

In addition learners will require access to:

- Standard workshops, equipment and tools should be available for practical exercises
- Approved telecommunication tools
- Approved safety equipment

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.