

1. Module details**Module name****Data and Voice Cabling - Customer Premises****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 – 40 hours.

Module code

NUE314

Discipline code

0703

2. Module purpose

To develop skills and knowledge of the regulatory requirements pertaining to the installation of voice and data cabling systems in customer premises. The module will also assist participants to gain an understanding of safe work practices pertaining to the handling of voice and data cables.

3. Prerequisites

Nil.

4. Relationship to competency standards

This module provides some of the knowledge and skills underpinning competence in the following standards:
Electrical Contracting Industry Award Standards.
Electrical Stream Units 5.3.
Electronic Stream Units 5.3.

5. Content**Tender Documents**

Scope

Requirements

Codes and symbols

Take-off quantities

Conditions and equipment specifications

Compliance with regulatory requirements

Installation

Cable types - voice, data, category 5 and coaxial

Installation diagrams

Bending; Drawing-in

Distribution frames

Cable protection - mechanical and thermal

Compliance with regulatory requirements - TS 009 and TS 001

Earthing - TRC – MEN

Termination

Methods - crimping, soldering, wire wrapping, tapping and insulation displacement

Equipment for terminations

Colour codes

Minimisation of losses
Drawing interpretation
Cross connects
Cable types - voice, data, Cat 5 and coaxial
Termination devices - sockets and plugs
Compliance with regulatory requirements

Records

System layout
Cable runs
Cross-connects
Modifications
Test results
Compliance with regulatory requirements

Commissioning

Test equipment
System operation
Requirements of cable installers
Compliance with regulatory requirements
Certification of cabling system

6. Assessment strategy

Ideally assessment of this module will be holistic in nature requiring the demonstration of knowledge and skills identified in the module content, and the integration of the knowledge with those skills.

To be successful in this module, the student must show evidence of achievement of the module purpose. This is more than the independent achievement of individual learning outcomes.

Assessment methods

Written tests: Learners will provide answers to a variety of questions.

Practical exercises: Learners perform skills and apply knowledge to complete various practical exercises.

Simulation: Learners participate in a structured exercise involving the successful completion of a specific task simulating 'real-workplace' situations.

Problem solving: Learners response to a number of questions relating to a diagrams, text, a plans and the like.

Conditions of assessment

Normally learning and assessment will take place in a classroom/simulated environment.

Learners must be assessed by an appropriately qualified teacher or trainer / assessor who hold a current General Premises Cabling (GPC) or Based General Premises License (BCL) license with endorsements relevant to the module as issued by AUSTEL

NFROT principles apply

7. Learning outcome details

Learning outcome 1

Determine equipment requirements from a given specification.

Assessment criteria

- 1.1 Create a cabling schedule and an equipment list from a given specification detailing cabling requirements of domestic premises, commercial premises and industrial premises.
- 1.2 Select Category 5 compliant cable and cabling products.
- 1.3 Outline the design principles and installation requirements for a structured cabling system to AS 3080.

Learning outcome 2

Install voice and data cabling systems to industry standard and regulatory authority requirements.

Assessment criteria

- 2.1 Identify permitted cable and other cabling products.
- 2.2 Describe the construction of various permitted cables.
- 2.3 Correctly assemble and install cable trunking, conduits and accessories in accordance with manufacturers' specifications and the generally accepted industry standard of safe and sound practice.
- 2.4 Demonstrate the safe use of various cable dispensers.
- 2.5 Install various twisted pair cables (UTP and STP 50 pair) and coaxial cables in accordance with the regulatory authority requirements, manufacturers' specifications and the generally accepted industry standard of safe and sound practice.
- 2.6 Install various voice and data cabling systems in accordance with the regulatory authority requirements, manufacturers' specifications and the generally accepted industry standard of safe and sound practice.
- 2.7 Install telecommunications reference conductor system and earthing conductors in accordance with regulatory authority requirements (TS 009 and AS 3000).
- 2.8 Relate colour codes to identification of various voice and data cable pairs.

Learning outcome 3

Terminate voice and data cabling systems to specifications and regulatory authority requirements.

Assessment criteria

- 3.1 Summarise the requirements for approved interconnection and termination devices.
- 3.2 Prepare for termination various cables (including voice, data, Cat 5 and coaxial) in accordance with the regulatory authority requirements, the manufacturers' specifications and the generally accepted industry standard of safe and sound practice.
- 3.3 Terminate various cables (including voice, data, Cat 5 and coaxial) in accordance with the regulatory authority requirements, the manufacturers' specifications and the generally accepted industry standard of safe and sound practice.
- 3.4 Terminate telecommunications reference conductor system and earthing conductors in accordance with regulatory authority requirements (TS 009 and AS 3000).
- 3.5 Interconnect various customer and data equipment in accordance with the regulatory authority requirements, the manufacturers' specifications and the generally accepted industry standard of safe and sound practice.

Learning outcome 4

Produce and maintain record systems for cabling installations.

Assessment criteria

- 4.1 Establish new cabling records for distribution frames in accordance with regulatory authority requirements (TS 009, AS 3080 and AS 3084) and the generally accepted industry standard.
- 4.2 Maintain personal certification records (*'sign-off form'*) in accordance with the requirements of AUSTEL and the generally accepted industry standard.
- 4.3 Print a test report of a cabling system in accordance with the accepted industry standard and the recommendations of AS 3080.

Learning outcome 5

Commission a voice and data cabling system using appropriate test equipment.

Assessment criteria

- 5.1 Describe the principle of operation of the metallic time domain reflectometer and cable scanner.
- 5.2 Demonstrate the correct handling of test equipment in accordance with the recommendations specified by the manufacturer.
- 5.3 Test the resistance and integrity of the TRC system in accordance with the regulatory authority requirements.
- 5.4 Demonstrate the use of a metallic time domain reflectometer and cable scanner to locate various cable faults.
- 5.5 Perform a series of tests, on a cabling system, using various items of test equipment to confirm the correct operation of the system.
- 5.6 Interpret test results to confirm Category 5 compliance in accordance with the recommendations of AS 3080.

Learning outcome 6

Identify typical computer and local area network (LAN) topologies and explain how various cable systems support these topologies.

Assessment criteria

- 6.1 Identify a range of typical computer and LAN cabling systems and topologies.
- 6.2 Explain how the various cabling systems can support these systems and topologies.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for both theoretical and/or practical learning and module purpose.

The recommendation is learning and assessment be facilitated holistically. This may require a learning outcome sequence other than that indicated in the body of this module.

A further recommendation is for adopting an integrated theory/practice approach. This allows students to learn by experimentation and through research and laboratory reports.

Resource requirements

The following equipment is recommended: Cable, coaxial RG58 and RG59; Cable, data range 24 or 25 pr Category 5 cable; Cable, single core PVC 0.6/1kV 2.5 mm² and 6 mm² green and yellow; Cable, single core PVC 0.6/1kV 2.5 mm² and 4 mm² violet; Cable, voice (indoor and outdoor) range 50 pr; Catenary wire; Connector coaxial BNC; Connector IDC Scotchlok type UR2 and UY2; Distribution box various; Face plates and sockets various; Fixings and fastenings various; Frame 11 way various; Modular 8 x 8 connector jacks and plugs; Mounting blocks standard; Patch panel 8 x 8 modular IDC(min 8 port); Rack 19" for patch panel; Skirting trunking tri-compartment; Termination devices various; Termination enclosure 10 pair various; Termination module various; Underground splicing kit for underground cable

Students must have access to appropriate test equipment including metallic time domain reflectometer and cable testers (to Category 5).

References include: AUSTEL, *Customer Premises Cabling Manual*, Standards Australia

Australian Standards AS 3080, AS 3084 and AS 3085

Occupational health and safety requirements

A safe and healthy environment will be provided for students in regards to classroom and laboratory safety.