

**1. Module details**

**Module name**

**Telecommunications Structured Cabling**

**Suggested structured learning time**

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 36 to 40 hours.

**Module code**

NUE194

**Discipline code**

Electrotechnology - 0703225.

**2. Module purpose**

This module provides the student with the knowledge and skills to correctly understand structured cabling system installations, covering twisted pair, coaxial cable and category 5 or similar/higher performance cabling.

**3. Learning pathway**

**Intended use in the structured learning program**

This module is intended to further supplement experience in working with telecommunication networks. In particular it focuses on the installation, termination and testing of structured cables.

Therefore before undertaking this module a Learner should have a clear understanding of general telecommunication networks and the need to work safely.

**Recommended prerequisites**

For the most effective learning this module should be undertaken only after modules NBB002, NE190 and NE191 have been completed.

**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**

1. Category 5 structured cabling design principles
2. Category 5 structured cabling installation systems
3. Category 5 structured cabling performance requirements
4. Selecting cable and cabling hardware
5. Testing Category 5 cabling

	<ul style="list-style-type: none"><li>6. Local area network cabling systems</li><li>7. Coaxial cables</li><li>8. Coaxial cable installation systems</li><li>9. Twisted pair cable installation systems</li></ul>
<b>6. Assessment strategy</b>	
<b>Assessment methods</b>	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.
<b>Conditions of assessment</b>	Learning and assessment will take place in an environment that is conducive to a learner's development.
<b>7. Learning outcome details</b>	
<b>Learning outcome 1</b>	Summarise the Standards used for Structured cabling installation systems.
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>1.1 Define the overall structure of a structured cabling installation.</li><li>1.2 List the functional elements of a structured cabling installation system.</li><li>1.3 Define the inter-relationship between the functional elements of a structure cabling installation system.</li><li>1.4 Identify from plans, drawings and schematics the respective cables used in a structured cabling installation systems</li><li>1.5 Identify the relevant regulation, standard or code applicable to structured cabling installation systems</li></ul>
<b>Learning outcome 2</b>	Identify different coaxial cable types.
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>2.1 Describe coaxial cable construction.</li><li>2.2 Describe qualshield and trishield coaxial cables.</li><li>2.3 Describe armour plated coaxial cable</li></ul>

	2.4	List the uses of coaxial cable
	2.5	Define the requirements including the ACA's, if any, for coaxial cable as specified in the standard - AS3185-98.
<b>Learning outcome 3</b>		Install and terminate coaxial cabling in accordance with the standard - AS 3815-98.
<b>Assessment criteria</b>	3.1	List the approved practices for installing coaxial cabling including separation and segregation requirements.
	3.2	Identify the safety recommendations for coaxial cabling installations.
	3.3	Identify the different types of coaxial cable connectors and termination devices.
	3.4	Demonstrate the correct selection of coaxial cable connectors compatible with the cable type and the environment.
	3.5	Select the correct terminating tool for the connector type.
	3.6	Demonstrate the correct use of tools in accordance with the manufacturer's instructions and OH&S guidelines.
	3.7	Demonstrate the correct termination of coaxial cable connectors safely.
	3.8	Carry out continuity test of the termination.
	3.9	Describe test procedures for fault diagnosis and location techniques.
	3.10	Record the outcomes using electronic or manual means in accordance with approved documentation requirements
<b>Learning outcome 4</b>		Identify Category 5 or similar/higher performance cable types.
<b>Assessment criteria</b>	4.1	Define cable characteristics for Category 5 or similar/higher performance transmission parameters.
	4.2	Distinguish between UTP, FTP, and STP Category 5 and similar/higher performance cables.

	4.3	State the electrical characteristics of Category 5 or similar/higher performance cable installation as defined in the standard - AS 3080-96
<b>Learning outcome 5</b>		Install and terminate Category 5 or similar/higher performance cable.
<b>Assessment criteria</b>	5.1	Define the minimum requirements for Category 5 or similar/higher performance cabling requirements including separation and segregation techniques.
	5.2	Describe the general requirements for Category 5 or similar/higher performance connecting hardware as defined in the standard - AS 3080-96.
	5.3	Demonstrate the correct installation requirements for Category 5 or similar/higher performance cable as defined in the standard - AS 3080-96.
<b>Learning outcome 6</b>		Test Category 5 or similar/higher performance cabling installation as defined in the standard - AS 3080-96.
<b>Assessment criteria</b>	6.1	Select the correct tools and test equipment required to test Category 5 or similar/higher performance cable installations.
	6.2	Describe the correct testing procedures for Category 5 cabling installations such as: <ul style="list-style-type: none"><li>• Attenuation to crosstalk ratio (ACR)</li><li>• Near End crosstalk (NEXT)</li><li>• Return loss and propagation delay</li><li>• Attenuation</li></ul>
	6.3	Describe test procedures for fault diagnosis and location techniques.
	6.4	Describe the recording process for the results of the test in accordance with requirements
<b>Learning outcome 7</b>		Install and terminate twisted pair (telephone) cabling in accordance with the standard.
<b>Assessment criteria</b>	7.1	List the approved practices for installing twisted pair telephone cabling, including separation & segregation.
	7.2	Identify the safety recommendations for telephone twisted pair cabling installations.

- 7.3 Identify the different types of telephone twisted pair cable connectors.
- 7.4 Demonstrate the correct selection of telephone twisted pair cable connectors compatible with the cable type and the environment.
- 7.5 Select the correct terminating tool for the connector type.
- 7.6 Demonstrate the correct use of tools in accordance with the manufacturer's instructions and OH&S guidelines.
- 7.7 Demonstrate the correct termination of telephone twisted pair cable connectors safely.
- 7.8 Carry out continuity test of the termination.
- 7.9 Describe test procedures for fault diagnosis and location techniques.
- 7.10 Record the outcomes in accordance with requirements

**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.

*Students will require access to the following reference material or their replacement:*

TS008

TS009

AS/NZS 1668

AS1199

AS 1670

AS1851

AS 2220

AS/NZS 3000 series and related sub-standards

AS/NZS 3100 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
- Certified testing equipment

**Occupational health  
and safety requirements**

*In addition learners will require access to:*

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

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EEQSBA<sup>1</sup> **User Guides** (*these outline in detail what training and work performance the Learner is required to undertake for the program*).

A safe and healthy environment will be provided for learners and teachers. Safety procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.

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<sup>1</sup> EEQSBA – ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd.