

1. Module details

Module name

Electrical Wiring Systems

Suggested structured learning time

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

Module code

NUE407

Discipline code

0703101

2. Module purpose

This module develop knowledge and skills in the installation of wiring systems and equipment. Learners will gain skills to install TPS cable, TPI cables, MIMS cables, armoured, trailing cables, metallic wiring enclosures, cable trays and catenary wires.

Learners will also develop knowledge and skills in applying regulatory requirements to the installation of wiring and equipment.

3. Learning pathway

Intended use in the structured learning program

This module is intended to supplement workplace exposure to electrical installation work. In particular it applies the application of regulatory requirements for installing a variety of electrical wiring systems and equipment.

Therefore before undertaking this module a student should have a clear understanding and experience of the use of tools, fixing devices, accessories and cable terminations and how the fundamental principles for safety apply.

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules NE172, NE175 and NUE062 have been completed and in conjunction with module NUE044.

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 EEQSBA.

This module supports the development of essential capabilities required for electrical licensing.

5. Content

1. TPI cables and wiring enclosures
 - regulatory requirements for use and installation of cable enclosures and TPI cables
 - techniques for installing metallic and non-metallic conduit and trunking/duct wiring systems
 - techniques for connecting accessories and equipment to fixed wiring
 - testing
2. MIMS cables
 - regulatory requirements for installation of MIMS cable
 - techniques for installing, fixing/supporting and terminating MIMS cable at accessories, equipment and switchboards
 - testing
3. Armoured cable
 - regulatory requirements for installation of armoured cable
 - techniques for installing, fixing/supporting and terminating steel wire armoured cable at accessories, equipment and switchboards
 - testing
4. TPS cables
 - regulatory requirements for the installation of flat and circular TPS cables and accessories
 - installation techniques for exposed TPS wiring
 - termination at accessories, equipment and switchboards
 - testing
5. Catenary supported cables and pendants
 - regulatory requirements for the installation of catenary supports, flexible cord and pendant type socket outlets
 - techniques for installing catenary support cables and trailing cable systems
 - testing

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	Normally learning and assessment will take place in a formal learning environment.
7. Learning outcome details	
Learning outcome 1	Determine and apply the regulatory requirements in relation to the installation of TPS cables, and install TPS cables in a simulated installation.
Assessment criteria	<ul style="list-style-type: none">1.1 Determine the regulatory requirements for the installation of flat and circular TPS cables.1.2 In a simulated installation suitable for exposed circular TPS cable install a final subcircuit for lighting or a socket outlet or an appliance.1.3 Check and test the final subcircuit (1.2) to ensure it complies with requirements and is safe to connect to the supply.
Learning outcome 2	Determine and apply the regulatory requirements for cable enclosures and in relation to the installation of TPI cables and install TPI cables in a simulated installation.
Assessment criteria	<ul style="list-style-type: none">2.1 Determine the regulatory requirement for the installation of cable enclosures such as metallic and non-metallic conduit and trunking.2.2 In a simulated installation suitable for TPI cable enclosed in conduit and trunking, install a final subcircuit for lighting or a socket outlet or an appliance.2.3 Check and test the final subcircuit (2.2) to ensure it complies with requirements and is safe to connect to the supply.
Learning outcome 3	Determine and apply the regulatory requirements in relation to the installation of MIMS cables and install MIMS cables in a simulated non-domestic installation.
Assessment criteria	<ul style="list-style-type: none">3.1 Determine the regulatory requirements for the installation of MIMS cable.

	<p>3.2 In a simulated installation suitable for MIMS cable, install a final subcircuit for lighting or a socket outlet or an appliance.</p> <p>3.3 Check and test the final subcircuit (3.2) to ensure it complies with requirements and is safe to connect to the supply.</p>
Learning outcome 4	Determine and apply the regulatory requirements in relation to the installation of armoured cables and install armoured cable in a simulated installation.
Assessment criteria	<p>4.1 Determine and apply the regulatory requirements in relation to the installation of armoured cable.</p> <p>4.2 In a simulated installation suitable for armoured cable install a final subcircuit for a socket outlet or appliance.</p> <p>4.3 Check and test the final subcircuit (4.2) to ensure it complies with requirements and is safe to connect to the supply.</p>
Learning outcome 5	Determine and apply the regulatory requirements in relation to the installation of catenary supported cable, pendant-type socket outlet and trailing cables and install catenary supported cables in a simulated installation
Assessment criteria	<p>5.1 Determine the regulatory requirements for the installation of catenary supported cables and pendant-type socket outlets.</p> <p>5.2 In a simulated installation suitable for catenary support cable system install a final subcircuit for a socket outlet or a tracking cable for an appliance.</p> <p>5.3 Check and test the final subcircuit (5.2) to ensure it complies with requirements and is safe to connect to the supply.</p>
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 Learners learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for Learners to carry out exercises on an individual basis. This includes structures such as wall and ceiling framing, facilities for concealed and surface wiring and MEN earthing and switchboards.

Useful references include:

Pethebridge, K., and Neeson, I., 2001, *Electrical Wiring Practice*, 6 Ed, Vol.1& 2., McGraw Hill, Sydney.

Standards Australia, Standards New Zealand:

AS/NZS 3000:2000 *Wiring rules*

AS/NZS 4836 *Safe working practice on low-voltage electrical installations*

AS/NZS 3017 *Electrical Installations – Testing guidelines*

WorkCover Codes of Practice

Local electricity distributor and authority regulations

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EEQSBA¹ **User Guides** (*these outline in detail what training and work performance the Learner is required to undertake for the program.*)

Occupational health and safety requirements

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.

¹ EEQSBA – ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd.