

1. Module details

Module name

Electrical Wiring and Equipment 4

Suggested structured learning time

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

Module code

NUE063

Discipline code

0703110

2. Module purpose

This module provides Learners with knowledge and skills in developing circuit diagrams and wiring schemes for circuits to perform a specific function. They will gain skills in developing circuit and wiring diagrams, installing such circuits, testing and diagnosing circuit faults.

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 to the installation, maintenance, commissioning, testing, fault findings and repair of control circuits and equipment.

Therefore before undertaking this module a student should have a clear understanding and experience of electrical installations in general and how the fundamental principles for safety apply. It provides an alternative pathway to NE32.1 Circuit Development 1.

Recommended prerequisites

For the most effective learning this module should be undertaken only after other modules in electrical wiring and equipment 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 EEQSBA.

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

5. Content

1. Developing circuits

- circuit diagrams
- diagrams for wiring schemes

2. Control devices
 - function
 - selection
3. Control circuits
 - operational sequence
4. Installation
 - multicore cable scheme
 - single insulated cable in conduit scheme
5. Fault finding
 - typical faults
 - fault prevention

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

Develop circuits to perform a specific function from specifications

Assessment criteria

- 1.1 Develop diagrams for each of the following
 - remotely controlled power circuit
 - stop-start circuit
 - remote stop-start circuit
 - timer-controlled circuit
 - interlocked circuit
 - non-latching jogging circuit
 - press safety circuit

	1.2	Develop wiring diagrams for the circuits developed in 1.1 for: <ul style="list-style-type: none">• multicore TPS cable scheme• TPI and conduit wiring scheme
Learning outcome 2		Select appropriate contactors and control circuit devices to perform specified functions.
Assessment criteria	2.1	Describe the function of a variety of control devices.
	2.2	Select appropriate control devices for a particular application.
Learning outcome 3		Install wiring and equipment for the circuits developed in 1.1.
Assessment criteria	3.1	Install wiring and equipment for power and control circuits using: <ul style="list-style-type: none">• multicore TPS cable• TPI and conduit wiring systems
	3.2	Test circuits to ensure they are safe.
	3.3	Test circuit operation.
Learning outcome 4		Explain the sequence of operation of basic control circuits.
Assessment criteria	4.1	Describe the operation of the circuit.
Learning outcome 5		Apply fault-finding principles and techniques to a basic control circuit.
Assessment criteria	5.1	Identify the circuit fault and its cause.
	5.2	Repair the fault.
	5.3	List possible methods of preventing the fault's re-occurrence.
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 a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for students to carry out exercises on an individual basis.

Useful references include:

Jenneson, J. R. 1996, *Electrical Principles for Electrical Trades*, 4th Ed., McGraw Hill, Sydney

Pethebridge, K., and Neeson, I., 2001, *Electrical Wiring Practice*, 6th 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

HB: 1996 Electrical and Electronic Drawing Practice for students

WorkCover Codes of Practice

Manufacturer's catalogues

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