

1. Module details**Module name****Electrical Wholesale Technology II****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 18 – 20 hours.

Module code

NUE004

Discipline code

0703120

2. Module purpose

To provide knowledge of safety with regard to electrical wiring and equipment and how to use relevant standards. Students will be able to identify common cable types and also learn to select a variety of fixing devices used in installing cables, cable enclosures and accessories.

3. Prerequisites

Nil.

4. Relationship to competency standards

This module provides some of the knowledge and skills underpinning competence in the following standards. Federal Metals Industry Award Standards, Unit 10.2A.
Electrical Contracting Industry Award Standards:
Electrical Stream - 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.10
Electronic Stream - 5.1, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8
Instrumentation Stream - 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 5.8.

5. Content**The features, purposes and use of block, circuit and wiring diagrams****Use of drawing symbols and Australian Standard 1102****Electrical diagram conventions****The features purpose and use of site and floor plans and detail and standard drawings****Locating the position of electrical services from architectural drawings****The relationship between electrical and other trades in the building construction sequence****Building materials used in house construction****Building materials and their properties****Cords and Cables**

materials and specifications
colour coding
cable structures
typical applications

Conductors

size
types

Electrical accessories

type and applications
fixing methods and techniques (timber, metal, hollow wall, masonry – expansion and chemical, explosive)

6. Assessment strategy

Assessment methods

Assessment need not take place at the end of every learning outcome, that is, providers of training are encouraged to assess learning outcomes using an integrated approach where appropriate. Learning outcomes may be grouped together and assessment of the module may be achieved through an overall project or activity which takes account of all learning outcomes.

The following methods are suggested for measuring progress towards and achievement of the learning outcomes of this module:

- verbal or written report
- practical demonstration
- oral questioning etc

To be credited with this module the trainee must demonstrate competency in all learning outcomes.

Conditions of assessment

On Job assessment tasks are described in the On Job Training Record Book.

The conditions related to assessment of the learning outcomes are dependent on the mode of delivery. A range of assessment strategies or options are available to suit the needs of the trainees. The needs of the trainee will be met by the provision of:

- a real or simulated electrical wholesale environment appropriate to the assessment task
- relevant trainee handouts, guidelines and reference material
- appropriate equipment and facilities

7. Learning outcome details

Learning outcome 1

Identify and read electrical diagrams.

Assessment criteria

- 1.1 Identify and distinguish between block circuit and wiring diagrams.
- 1.2 List the information contained in the diagrams specified in 1.1.
- 1.3 State the purpose of each of the diagrams specified in 1.1.
- 1.4 Relate typical diagram symbols to physical components.

Learning outcome 2

Identify and read architectural drawings.

Assessment criteria

- 2.1 Identify and distinguish between site plans, floor plans, detail drawings and standard drawings.
- 2.2 From a site plan locate the:
 - service point
 - consumers main
 - main switchboard
 - distribution boards
 - temporary and / or builders supplies.
- 2.3 List the power and lighting outlets required.
- 2.4 Identify the types of luminaires and outlets required.
- 2.5 Identify and locate luminaire switching positions.

Learning outcome 3

Describe the constructional sequence for commonly used building construction methods.

Assessment criteria

- 3.1 Arrange the constructional states in sequence.
- 3.2 Identify the stages at which electrical first and second fixings can occur.
- 3.3 List areas of cooperation between electrical and other trades.
- 3.4 Identify building materials and their properties.

Learning outcome 4

Describe the construction, specifications, colour coding and application of cords and cables.

Assessment criteria

- 4.1 Explain the terms conductor material, stranding, insulant type, voltage rating, temperature rating, colour coding, sheathing, armour and serving.
- 4.2 State the Australian and International colour standards for cable and cords.
- 4.3 Describe the construction of the following cords and cables:
 - single - core sheathed and unsheathed cables insulated with R75, V75, V90, V105, R - EP - 90 or R - CSP - 90 insulation
 - multicores sheathed and unsheathed, armoured and unarmoured cables insulated with R75, V75, V90, V105, XPLE, R - EP - 90 or R - CSP - 90 insulation
 - screened and shielded cables
 - mineral insulated copper - sheathed cables with copper conductors
 - cables and cords with R - S - 150, Type 150 fibrous and 150 type PTFE insulation
 - paper - insulated lead - sheathed and armoured and aluminium sheathed cables.
- 4.4 Identify cords and cables by conductor size and type.
- 4.5 Describe typical application for given cord and cable types and wiring systems.

Learning outcome 5

Describe and select a range of electrical fixing devices according to the electrical accessories, in a given electrical installation.

Assessment criteria

- 5.1 Describe briefly the typical application of a variety of commonly used electrical accessories, and fixing devices.
- 5.2 Identify a range of electrical fixing devices used for fixing electrical accessories to:
 - timber
 - hollow walls
 - masonry
 - metal structures.
- 5.3 Assess the appropriate application and fixing device for the electrical accessory.
- 5.4 Identify and select the appropriate fixing device.

8. Delivery of the module

Delivery strategy

This module provides for delivery by on the job training in a variety of modes. Strategies should be selected to reflect the nature of the learning outcomes and the needs of the student. Some areas of content may be common to more than one learning outcome and therefore integration may be appropriate.

Resource requirements

Specialised facilities and equipment

The training provider should have access to:

- typical architectural and electrical drawings
- electrical accessories including various switches.

Training staff and assessors

Integrated theory and practical lessons complemented with site visits.

Learning resources

The references listed below should not be regarded as a definitive list and should be amended and updated on a regular basis. This list is not intended to be prescriptive as it is realised that many teachers / trainers have assembled their own references and resources.

Local supply authority regulations.

Pethebridge, K. and Neeson, I. *Australian Electrical Wiring, Vol. 1 and Vol. 2*, McGraw - Hill, Sydney, 1991 - 1992.

Standards Australia, SAA Wiring Rules - AS 3000, 1991.

Occupational health and safety requirements

Providers of training should ensure that the relevant industry codes of practice and occupational health and safety requirements are met during the delivery of this module.