

**1. Module details**

**Module name**

**Lighting**

**Suggested structured learning time**

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 18 to 20 hours.

**Module code**

NE164.1

**Discipline code**

0703110

**2. Module purpose**

This module provides Learners with knowledge and skills for installing, fault finding and repair lighting and luminaries.

Learners will gain knowledge of the basic concept of illumination, the various types of lamps and luminaires and the installation requirements for general and emergency lighting. Learners will gain knowledge of the operating principles of discharges lighting and develop skills in locating and repairing faults. Installation of smokes detectors, often installed on lighting circuits, is also covered.

**3. Learning pathway**

**Intended use in the structured learning program**

This module is intended to supplement exposure to electrical installation work. In particular it applies to the installation, maintenance, testing, commissioning, fault finding and repair of lighting and luminaries.

Therefore before undertaking this module a Learner should have a clear understanding and experience of electrical installations and how the fundamental principles for safety apply.

**Recommended prerequisites**

For the most effective learning this module should be undertaken only after modules in single phase theory and 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. Lighting principles
2. Lamp types
3. Luminaire circuits
  - auxiliary equipment – purpose; rating; etc.
  - circuit
  - typical fault symptoms / test results
4. Lighting arrangements
  - regulation
  - multiway switching
  - master switching
  - dimming
  - Lighting Energy Management / Integrated Systems
5. Emergency lighting

**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**

Demonstrate an understanding of the basic illumination principles and the use of the appropriate terminology and relevant standards.

**Assessment criteria**

- 1.1 Use the inverse square law in lighting calculations
- 1.2 Describe factors that are essential to produce visual comfort including recommended lighting levels.
- 1.3 Use and identify the correct lighting terms and their units in describing process and concepts of illumination.

<b>Learning outcome 2</b>	Demonstrate an understanding of the basic types of luminaries.
<b>Assessment criteria</b>	2.1 Identify luminaries types both functional and decorative. 2.2 Describe the advantages of the use of reflectors and diffusers.
<b>Learning outcome 3</b>	Demonstrate knowledge and skills in installing, diagnosing faults and repairing luminaries.
<b>Assessment criteria</b>	3.1 Identify lamp types and describe their characteristics. 3.2 Describe the operating principles of various types of lamps and luminaries and the purpose of their auxiliary control equipment. 3.3 Describe the cause of low power factor and the measures used to improve power factor in discharge lighting. 3.4 Determine the Wiring Rules requirements for the installation of lighting equipment and accessories. 3.5 Diagnose faults and repair fault lamp circuits and luminaries.
<b>Learning outcome 4</b>	Describe the special requirements for emergency lighting.
<b>Assessment criteria</b>	4.1 State factors and special requirements for emergency lighting. 4.2 Describe the requirements for the installation, of smoke detection in domestic and residential premises. 4.3 Determine the requirements for the installation testing and maintenance of emergency lighting smoke detectors. 4.4 Determine the requirements for the installation testing and maintenance of smoke detectors.

**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.

Useful references include:

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

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

Standards Australia, Standards New Zealand:

*AS/NZS 3000:2000 Wiring rules*

*AS/NZS 2293 (series) Emergency evacuation lighting for buildings*

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

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 EEQSBA<sup>1</sup> **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.

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