

1. Module details

Module name

Drawings and Diagrams for Electrical Work

Module duration

It is expected that a Learner possessing the prerequisite skills and knowledge will achieve the module purpose in 36 to 40 hours.

Module code

NUE062

Discipline code

0703110

2. Module purpose

This module will develop the skills and knowledge of Learner to interpret engineering and architectural drawings and produce detailed freehand sketches of component parts, complete objects, floor plans and site layouts associated with the electrotechnology industry.

It will also provide the Learner with the skills and knowledge to identify building structures, building materials and building constructional sequences used in the building and construction industry.

Also, Learners will be introduced to electrical drawing standards and conventions and drawing of common switching arrangements.

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 of wiring and fault-findings.

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

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules in occupational health and safety and basic electrical theory 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. Mechanical drawing
 - conventions
 - abbreviation and symbols
 - interpretation
2. Mechanical drawing
 - freehand sketching
3. Architectural drawings
 - conventions
 - abbreviation and symbols
4. Electrical installation sequence
 - construction stages
 - other trades
 - building materials
5. Cable schedules
 - use
 - development
6. Electrical drawing
 - types
 - purpose
 - component symbols
7. Basic switching circuits
 - switch charts
 - single and multi switching
 - wiring methods

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

Interpret the information contained in basic engineering drawings.

Assessment criteria

- 1.1 Describe the conventions used in drawings of mechanical components.
- 1.2 Explain the meaning of basic abbreviations and symbols used in drawing of mechanical components.
- 1.3 Identify mechanical components and their specifications from information in a drawing of the component.

Learning outcome 2

Draw a freehand sketches of mechanical components.

Assessment criteria

- 2.1 Layout a drawing of a mechanical component using engineering drawing convention.
- 2.2 Draw freehand a mechanical component showing all information needed for its manufacturer/fabrication.

Learning outcome 3

Interpret the information contained in architectural drawings.

Assessment criteria

- 3.1 Describe the conventions used in construction drawings of buildings, structures and landscapes.
- 3.2 Explain the meaning of abbreviations and symbols used in construction drawings.
- 3.3 Identify the location of electrical components by the symbols shown on construction drawings.
- 3.4 Draw the location of electrical components on a floor plan.

Learning outcome 4

Explain the sequence of installing wiring accessories and current using equipment during the construction of a building.

Assessment criteria

- 4.1 Identify the stages of construction at which the installation of wiring, accessories and current-using equipment can occur.
- 4.2 List areas in which cooperation between electrical and other trades must occur.
- 4.3 Identify building materials and how their properties may effect the installation of electrical wiring and accessories.

Learning outcome 5	Use cable schedules to interpret/provide details of wiring schemes for a given installation.
Assessment criteria	5.1 Identify the type of cable, their origin and route from a cable schedule. 5.2 Develop a cable schedule for a given installation.
Learning outcome 6	Interpret the information contained in electrical diagrams.
Assessment criteria	6.1 Describe the convention used in representing electrical circuits by block diagram, circuit diagram and wiring diagram. 6.2 State the purpose of block diagrams, circuit diagrams and wiring diagrams. 6.3 Relate typical diagram symbols to physical components.
Learning outcome 7	Develop and draw freehand basic switching circuits using standard drawing conventions.
Assessment criteria	7.1 Draw a switching chart for lighting control switch. 7.2 Drawing a circuit to control light points from: <ul style="list-style-type: none">• a single position• two positions,• more that two positions. 7.3 Draw circuits to control light points using multicore cable: <ul style="list-style-type: none">• looping at the light point• looping at the switch.

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 Trade*, 4th Ed., McGraw Hill, Sydney

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

Standards Australia, Standards New Zealand:

HB3:1996 *Electrical and electronic drawing practice for Learner*

HB7 *Engineering Drawing Handbook*

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

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.