

1. Module details

Module name

Introduction To Fire Alarm Installations

Suggested structured learning time

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

Module code

NUE490

Discipline code

0703110

2. Module purpose

This module provides an introduction to the purpose of automatic fire detection and alarm equipment and how it operates. It focuses on standards and codes and the types of equipment used.

3. Learning pathway

Intended use in the structured learning program

This module is intended to supplement supervised workplace experience in installing fire alarm systems. In particular it focuses on the operation and purpose of components and the standards and regulation that apply.

Therefore before undertaking this module a learner should have a basic understanding of building structures and electrical circuits.

Recommended prerequisites

For the most effective learning, this module should be undertaken only after modules covering basic electrical circuits and building methods 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 NUEITAB.

5. Content

1. Introduction to fire alarm systems

- Purpose of fire alarm systems:
Preservation of life in addition to protection of buildings and equipment.
- Operational principles of fire alarm systems:
Fire detection, role of panels and warning devices.

2. Control and indicating equipment

- Purpose of fire alarm panels:
Role of fire alarm panels including signal processing, warning device activation, fire brigade notification and control of other automated building systems such as smoke management.
- Operational principles of fire alarm panels:
Performance requirements of the BCA and AS1670.
- Types of fire alarm panels:
Types of fire alarm panels include conventional (collective) and addressable (analogue).

3. Warning Devices

- Purpose of warning devices:
Role of warning devices including strobes and alarm sounders in notifying people of a fire hazard.
- Types of visual warning devices:
Types of visual warning devices include strobes.
- Operational principles of visual warning devices:
Performance aspects of differing types of visual warning devices including strobes.
- Types of audible warning devices:
Types of audible warning devices include alarm sounders, tone generators (speakers) and bells.
- Operational principles of audible warning devices:
Performance aspects of differing types of audible warning devices including alarm sounders, tone generators (speakers) and bells.

4. Smoke and heat detectors

- Purpose of heat and smoke detectors:
Role of heat and smoke detectors including detection of smouldering or flaming fires.
- Types of smoke detectors:
Types of smoke detectors may include ionisation, photoelectric, optical beam, and aspirating detectors.
- Operational principles of smoke detectors:
Performance aspects of differing types of smoke detectors including ionisation, photoelectric, optical beam or aspirating detectors.
- Types of heat detectors:
Types of heat detectors may include point type heat detectors and linear (including optical fibre) heat detectors.
- Operational principles of heat detectors:
Performance aspects of point type heat detectors and linear (including optical fibre) heat detectors.

5. Codes and standards

- Australian Standards:
Relevant Australian Standards include AS1603, AS1668, AS1670, AS1851, AS3000 and AS4428.
- State Government Building Regulations:
Relevant Regulations include those referencing the Building Code of Australia
- Industry Codes of Practice:
Relevant Regulations include FPAA001: Code of Practice for the Installation and Maintenance of Fire Protection Equipment
- Cabling Requirements:
Relevant requirements include AS1670 and the Australian Communications Authority's (ACA) Cabling Provider Rules.

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	Learning and assessment will take place in an environment that is conducive to a learner's development.
7. Learning outcome details	
Learning outcome 1	Define the role of a fire alarm system
Assessment criteria	<ul style="list-style-type: none">1.1 Describing the role fire alarm systems play in protecting property and life from fire.1.2 Describing the roles of detectors, fire alarm panels in addition warning devices.
Learning outcome 2	Define the role and function of control and indicating equipment
Assessment criteria	<ul style="list-style-type: none">2.1 Identify the different types of fire alarm panels.2.2 Describe the roles of fire alarm panels.2.3 Describe why different types of fire alarm panels have been selected for certain installations.2.4 Identify different types of automated building systems that may be connected to a fire alarm panel.2.5 Describe why different types of automated building systems that may be connected to a fire alarm panel.
Learning outcome 3	Define the role and function of warning devices
Assessment criteria	<ul style="list-style-type: none">3.1 Identify the different types of visual warning devices.3.2 Describe the role and function of visual warning devices.3.3 Identify the different types of audible warning devices.3.4 Describe the role and function of audible warning devices.
Learning outcome 4	Define the role and function of fire and smoke detection
Assessment criteria	<ul style="list-style-type: none">4.1 Identify the different types of smoke and heat detectors4.2 Describe operational characteristics of ionisation, photoelectric and optical beam smoke detectors.4.3 Describe operational characteristics of aspirating smoke detectors.

Learning outcome 5	4.4 Describe operational characteristics of heat detectors.
Assessment criteria	Define the role of codes and standards 5.1 List the general legislative requirements and codes in a given state or territory pertaining to automatic fire alarm systems. 5.2 List the specific legislation in a given state or territory relating to automatic fire alarm installations. 5.3 Outline the legal ramifications of failure to comply with the relevant legislation and codes. 5.4 Identify the Australian Standards which relate to the installation of fire alarm systems. 5.5 Describe the link between the Regulations, Building Code of Australia and Australian Standards 5.6 Identify industry Codes of Practice and summarise their purpose
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 learning outcome sequence other than that indicated in the module.
Resource requirements	Resources should be sufficient for students to carry out learning activities on an individual basis.

Suggested Learning Resource:

AS1603	Automatic Fire Detection and Alarm Systems
AS1668.1	The use of Mechanical Ventilation and Air-conditioning in Buildings (Part 1: Fire and smoke control in buildings)
AS1670	Automatic Fire Detection and Alarm Systems – System design, installation and commissioning (All parts)
AS1851.8	Maintenance of Fire Protection Equipment (Part 8: Automatic fire detection and alarm systems)
AS3000	Electrical Installations
TS-009	Cabling Rules
FPAA001	Code of Practice for the Installation and Maintenance of Fire Protection Equipment
BCA96	Building Code of Australia

It is strongly advised that students have access to a range of product literature available from manufacturers and suppliers of fire alarm systems.

Specialised facilities and equipment required by the training provider include:

- Access to a range of building sites where fire alarm systems are being installed
- Control and indicating equipment
- Visual warning devices and audible warning devices

In addition students will require access to:

- Standard electronic laboratory equipment should be available for practical exercises
- Standard electronic industry hand tools for assembly and installation of equipment

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).

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

**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.