

**10. Module details****Module name****Telecommunications Optical Fibre Cabling****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 - 40 hours.

**Module code**

NUE195

**Discipline code**

0703225.

**2. Module purpose**

This module provides the student with the knowledge and skills in identifying, preparing, terminating and installing optical fibre cable and connector types.

**3. Prerequisites**NBB02 Occupational Health and Safety.  
NUE190 Telecommunications Standards and Regulations.**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****Operating principles of fibre optical cable****Installation of fibre optical cable****Termination and splicing techniques****Transmission testing****Fault-finding****Testing according to requirements and OH&S guidelines****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

**Describe the operating principles of optical fibre transmission.**

#### Assessment criteria

- 1.1 List the range and advantages of the different types of optical fibre types available in the market, in terms of telecommunications voice and data transmission.
- 1.2 Describe the difference between multimode and single mode transmission.
- 1.3 Identify the advantages of optical fibre cable compared to other cables.
- 1.4 Define the applications of optical fibre cables.
- 1.5 Identify the requirements of optical fibre cables as specified in standards - AS 3080-96
- 1.6 Identify the immediate hazards associated with working with optical fibre.

### Learning outcome 2

**Describe installation techniques for optical fibre.**

#### Assessment criteria

- 2.1 Explain the purpose and procedures for pre-testing optical fibre cable prior to installation.
- 2.2 Identify any applicable regulations, standards or codes used for optical fibre installation
- 2.2 Explain the purpose for planning a cable route to ensure manufacturer specifications, for bending radii and hauling, are adhered to.
- 2.3 Describe the support and securing mechanisms for optical fibre installations.
- 2.4 State the precautions when handling optical fibre cables.
- 2.5 State the methods for securing and protecting cable against mechanical damage and stress.
- 2.6 Demonstrate the installation of an optical fibre cable in a given situation

**Learning outcome 3**

**Describe the termination and splicing techniques employed in optical fibre cable installations.**

**Assessment criteria**

- 3.1 Describe suitable and safe techniques for the preparation of fibre for termination.
- 3.2 Describe the direct termination method using connectors recommended in the standard - AS 3080-96 and in accordance with manufacturer's specifications.
- 3.3 Describe the termination procedure of prepared fibre utilising either pre-connectorised pigtailed using fusion-splicing equipment or similar approved techniques.
- 3.4 State appropriate devices used to protect terminations and splices against mechanical damage and, that prevent contamination.
- 3.5 Terminate and splice an optical fibre in a given situation

**Learning outcome 4**

**Perform transmission tests on optical fibre cabling installations using appropriate test equipment.**

**Assessment criteria**

- 4.1 State the essential eye safety practices and precautions when testing optical fibre installations.
- 4.2 Describe the use of optical fibre light source and power meter to accurately measure optical loss.
- 4.3 Describe the correct procedure to using an OTDR to measure optical power loss at a splice and from terminated fibre to terminated fibre.
- 4.4 Define the maximum optical loss for splices and connector terminations as specified in the standard - AS 3080.96.
- 4.5 Conduct transmission tests on optical fibre using test equipment

**Learning outcome 5**

**Test for and locate faults on optical fibre cable in accordance with requirements and OH&S guidelines.**

<b>Assessment criteria</b>	<p>5.1 Using appropriate test equipment (ODTR, Light Source Meter, etc.) test optical fibre cables and locate faults associated with faulty splice or connector, cracked or broken fibre and fibre contamination (moisture, dust, paint, etc) according to requirements, standards, codes and/or manufacturer's specifications.</p> <p>5.2 Identify active and inactive fibres using appropriate test equipment.</p> <p>5.3 Describe relevant documentations processes required for recording and reporting the results.</p>
<b>8. Delivery of the module</b>	
<b>Delivery strategy</b>	<p>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.</p>
<b>Resource requirements</b>	<p>Resources should be sufficient for students to carry out learning activities on an individual basis. This will require a range of support equipment and reference material.</p> <p><i>Students will require access to the following reference material or their replacements:</i></p> <ul style="list-style-type: none"> <li>• TS008</li> <li>• TS009</li> <li>• AS/NZS 1668</li> <li>• AS 1670</li> <li>• AS1851</li> <li>• AS 2220</li> <li>• AS/NZS 3000 series and related sub-standards</li> <li>• Telecommunications Act 1997 - overview</li> <li>• The Building Code of Australia Volumes 1-3</li> <li>• Australian Communications Authority Cabling Provider Rules – Benchmark Cabler Competency Requirements - 2000</li> <li>• Communication Cabling Manual BCL Package</li> <li>• Certified Components List (CCL)</li> <li>• Labelling</li> </ul>

**Occupational health  
and safety requirements**

*Specialised facilities and equipment required by the training provider include:*

- Access to a range of industrial sites that can assist in providing experiential learning associated with optical fibre installation and work.

*In addition learners will require access to:*

- Standard workshops and equipment should be available for practical exercises
- Approved optical fibre tools and testing equipment
- Approved safety equipment

A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.