1. Module details

Module name	**Network Operating Systems**
Suggested structured learning time	40 hours
Module code	NUE 119
Discipline code	0703225 Electrotechnology

2. Module purpose

This module would provide students with the knowledge and skills to install and configure a business machine on a common network O/S using TCP/IP protocols.

3. Prerequisite modules

ITH202 Using a Graphical User Interface

NE 115 Introduction to Local Area Networks

4. Relationship to competency standards

This module provides some of the skills and knowledge underpinning competence in the following:

Electrotechnology Industry Training Package National Units of Competency, specifically NES 108, NES 109 & NES 209A.

5. Content

Network systems

- Mainframe
- Mini computers
- Micro computers

WANs

- Protocols
- Protocol stacks
- Interconnectivity

LANs

- Protocols
- Terminal emulation

Operating systems

- NT
- UNIX
- LINUX
- Netware
- Windows 95
- Other NOS

Administration

- Duties
- Responsibilities
- Procedures
- User access
- Managing and configuring attached devices

TCP/IP

- Protocols
- Services
- IP addressing scheme
- Routing
- OSI model relationship
- Network address
- Broadcast address
- Multicast
- Fragmentation
- PPP implementation
- Bridging
- Network address translation

Equipment installation

- Driver loading
- Testing
- Troubleshooting

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 classroom/laboratory environment.

7. Learning outcome details

Learning outcome 1

Describe the typical network systems found in common use.

Assessment criteria

1.1 List typical mainframe network systems and their operating systems.

	1.2	List typical minicomputer network systems and their operating systems.
	1.3	List typical microcomputer network systems and their operating systems.
Learning outcome 2	**Identify and describe the fundamental characteristics of different network operating systems, highlighting the differences between them.**	
Assessment criteria	2.1	Define the purpose of an operating system.
	2.2	Describe the fundamental characteristics of different network operating systems.
	2.3	Describe the log on procedure for different operating systems.
	2.4	Describe and demonstrate the general properties of network operating systems including job scheduling, buffering, spooling, access, realtime and time-sharing.
Learning outcome 3	**Describe the duties and responsibilities of a network administrator.**	
Assessment criteria	3.1	Describe the duties and responsibilities of a network administrator.
	3.2	Establish new users on a network.
	3.3	Apply permission for a selected network device for user/group.
	3.4	State the need for an audit trail.
Learning outcome 4	**Describe the TCP/IP protocols and services.**	
Assessment criteria	4.1	Describe the TCP/IP suite of protocols.
	4.2	Draw the TCP/IP suite protocols stack.
	4.3	Draw a diagram relating the TCP/IP protocols, to the OSI model.
	4.4	Describe each of TCP/IP communication protocols.
	4.5	Describe each of the TCP/IP Suite services.
Learning outcome 5	**Describe the universal IP addressing scheme.**	

Assessment criteria	5.1	Describe the different IP address classes.
	5.2	Describe the term 'sub-net addressing'.
	5.3	Generate a sub-net addressing scheme for an organisation.
	5.4	Define the reserved IP addresses and state their use.
Learning outcome 6	**Configure and test a discrete peripheral device on a network.**	
Assessment criteria	6.1	Configure a discrete peripheral on a network using TCP/IP protocols.
	6.2	Install a software driver on a network for a discrete peripheral.
	6.3	Perform loopback testing on a discrete peripheral on a network.
	6.4	Utilise a discrete peripheral on a network.
	6.5	Ping a discrete peripheral on a network from a workstation.
	6.6	Resolve address conflicts if necessary.

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 way to achieve this is by the integration of theory and practice where students learn by experimentation and through research and laboratory reports. It is recommended that learning and assessment be facilitated in a holistic manner, which may require a learning outcome sequence other than that indicated in the module.

Recommended resource requirements

Minimum teacher qualifications:

Certificate IV Assessment & Workplace Training

Qualifications in the electrical/electronic discipline and a demonstrated high level of competency in network operations. This could be achieved by relevant workplace experience in this field.

Non human resources:

Resources should be sufficient for students to carry out practical exercises on an individual basis. This will require a small local area network.

- Computer System Basics-Peter Le Cornu
- Data Communication and Networks; Cooke, Mattingley, Sutton, Huber.
- Introduction to Network Administration; Huber, Kenny, May, Quarmby, Stephens
- Fundamentals of System Administration; Hamilton, Smith
- Network+ Guide to Networks; Tamara Dean

User Guides

Where this module is used in an approved Traineeship or Apprenticeship program students should be advised to obtain, where available, respective EEQSBA[1] ***User Guides*** (*these outline in detail what training and work performance the student is required to undertake for the program*).

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers, as well as safety procedures followed with regard to teaching/learning activities.

[1] EEQSBA - ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd