MANAGE OPERATING SYSTEM

UNIT CODE: 0611 451 05B

Relationship to Occupational Standards

This unit addresses the unit of competency: **manage operating system**

Duration of Unit: 210 hours

Unit Description:

This unit specifies competencies required to manage operating system. It involves identifying fundamentals of operating system, identifying concepts of process management concepts, identifying concepts of memory management, identifying concepts of input and output devices, identifying concepts of file management, identifying emerging trends in operating system

Summary of Learning Outcomes:

1. Identifying Fundamentals of operating system
2. Identifying concepts of Process management concepts
3. Identifying concepts of Memory management
4. Identifying concepts of Input and Output devices
5. Identifying concepts of file management
6. Identifying Emerging trends in Operating system

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods

1. Identify fundamentals of Operating system	• Definition of operating system
	• Concepts of operating system
	  o Characteristics
	  o Objectives/goals
	  o Kernel
	  o System call
	  o Shell
	• Evolution of operating systems
	• Operating system structures
		• Practical exercises with observation checklist
		• Oral questioning
		• Written test
		• Learner portfolio of evidence.

Learning Outcome	Content	Suggested Assessment Methods
	○ Monolithic ○ Layered ○ Virtual ○ Client-server model • Types of operating systems • Functions of operating systems • Installation of operating systems	
2. Identify process management concepts	• Concepts of processing are identified ○ Process ○ Threads ○ Process control block • Description of process states • Definition of concurrency control • Types of concurrency control ○ Inter-process communication ○ Synchronisation • Semaphores • Monitors • Message passing • Explanation of process scheduling ○ Features of scheduling algorithms ○ Types of schedulers ○ Scheduling algorithms • Non-preemptive • Preemptive • Priority • Definition of Deadlocks ○ Conditions for deadlock ○ Detection and recovery of deadlock ○ Avoidance and prevention of deadlocks ○ Resource allocation graphs.	• Practical • Project • Observation • Written test

Learning Outcome	Content	Suggested Assessment Methods

3. Identify concepts of memory management	• Definition of memory management
	• Objectives of memory management
	• Memory management techniques
	  o Partitions
	  • Fixed partitioning
	  • Dynamic partitioning
	  o Virtual memory
	  • Thrashing
	  • Overlays
	  • Paging
	  • Segmentation
	• Memory management policies
	  o Fetch
	  o Placement
	  o Replacement
	  o Cleaning
		• Practical exercises
		• Oral questioning
		• Written test

4. Identify concepts of Input and Output devices management	• Definition of input and output devices
	  o Input
	  o Output
	• Objective of input and output device management
	• Input and output concepts
	  o Input and output categories
	  o Device controllers
	  o Interrupt-driven input/output
	  o Direct Memory Access(DMA input/output)
	• Explanation of input and output software
	  o Principles of input and output software
	  o Input and output software layers
	• Description of disks
	  o Structure
		• Practical exercises
		• Oral questioning
		• Learner portfolio of evidence.

Learning Outcome	Content	Suggested Assessment Methods
	○ Operations ○ Disk arm scheduling algorithms • First In First Out (FIFO) • Shortest Seek Time First (SSFT) • SCAN • Circular-SCAN (C-SCAN) • LOOK • Circular LOOK (C-LOOK) • RAM disk • RAID • Computer clock system ○ Hardware ○ Software • Computer terminals ○ Terminal hardware ○ Terminal software • Definition of virtual device ○ Objectives of virtual device ○ Spooling ○ Buffering ○ Caching	
5. Identify concepts of file management	• Definition of file system management • File system concepts ○ Naming ○ Structure ○ Types ○ Attributes ○ Operations	• Practical exercises • Oral questioning • Written test • Learner portfolio of evidence.

Learning Outcome	Content	Suggested Assessment Methods

	• File access methods
	• Directory implementation
	• File allocation techniques
	• File protection and security
	  o Importance
	  o Access control
	  o Audit trial	

6. Identify Emerging trends in Operating system	• Explain the emerging trends in operating systems • Challenges of emerging trends • Coping with the emerging trends	• Practical exercises • Written test • Learner portfolio of evidence.

Suggested Methods of Delivery

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;

The delivery may also be supplemented and enhanced by the following, if the opportunity allows:

- Visiting lecturer/trainer from the ICT sector;
- Industrial visits.

Recommended Resources

Tools

- Transaction Processing Systems (TPS)
- Operation Information System (OIS
- Decision Support Systems (DSS)
- Enterprise resource planning (ERP)

Equipment

- Computers

Materials and supplies

- Digital instructional material including DVDs and CDs