OPERATING SYSTEMS

UNIT CODE: ICT/CU/CS/CR/02/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Understand Operating Systems

Duration of Unit: 130 hours

Unit Description:
This unit covers the competencies required to understand operating systems. It involves understanding fundamentals of operating systems, understanding process management, understanding memory management, understanding input-output management and understanding file management.

Summary of Learning Outcomes:

1. Understand fundamentals of operating systems
2. Understand process management
3. Understand memory management
4. Understand Input and Output management
5. Understand file management

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Understand fundamentals of operating systems	• Computer software ✓ Definition ✓ Classification • Operating system ✓ Definition ✓ Concepts ✓ Functions of operating system are identified. • Operating system structures ✓ Monolithic ✓ Layered ✓ Virtual ✓ Client-server model • Types of operating systems	• Practical exercises • Oral tests • Written tests • Observation

	• Requirements for Windows OS installation • Demonstration of Windows installation ✓ Specify hardware requirements ✓ Back up data in target machine ✓ Partition creation and/or formatting ✓ Installation as per vendor instructions ✓ Testing installation	
2. Understand process management	• Process management ✓ Definitions: Process, Thread, Process Control Block ✓ Functions of the Process Manager • Computer Resources • Process states and their transition ✓ States: Ready, Waiting, Complete, Running ✓ Transitions: Dispatch, Suspend, Exit, Resume • Process scheduling ✓ Features of scheduling algorithms ✓ Types of schedulers ✓ Scheduling algorithms • Demonstration of Task Manager ✓ Observing CPU queue ✓ Stopping CPU intensive processes. • Performance monitor tools in process management	• Practical exercises • Oral tests • Written tests • Observation

3. Understand memory management	• Memory Management ✓ Definition ✓ Objectives of Memory management ✓ Components of the Memory Management unit • Memory management techniques ✓ Partitioning ✓ Virtual memory: • Paging, Segmentation • Demonstration of virtual memory settings – Increasing the Windows page file size	• Practical exercises • Oral tests • Written tests • Observation
4. Understand input and output management	• Input - output management ✓ Definition ✓ Objectives of I/O management ✓ I/O hardware ✓ I/O software ✓ Polling Vs Interrupt drive I/O • Disk operations ✓ Access time factors ✓ Techniques for resolving slow disk I/O • Computer clock system ✓ Virtual Input Output ✓ Definition of Virtual I/O ✓ Types of virtual I/O: Buffering, Spooling, Caching • Disk selection criteria ✓ Size ✓ Speed • Disk properties in Windows • Demonstration of disk storage management operations	• Practical exercises • Oral tests • Written tests • Observation

	✓ Formatting volume ✓ Partitioning volume ✓ Shrinking volume ✓ Extending volume ✓ Optimising and defragmenting disk ✓ Changing drive security permissions ✓ Backing up ✓ Copying data to optical disks ✓ Handling removable media • Demonstration of device management operations using Windows Device Manager ✓ Verifying installed drivers ✓ Resolving driver conflicts	
5. Understand file management	• File management ✓ Definition ✓ Objectives of file manager ✓ File naming concepts • File access methods ✓ Sequential access ✓ Direct/Random access ✓ Indexed sequential access • File allocation techniques ✓ Contiguous ✓ File Allocation ✓ Indexed • File protection and security ✓ Importance ✓ Access control ✓ Audit trial • Demonstration of file and directory operations ✓ Creating folders and files ✓ Renaming folders and files ✓ Deleting folders and files	• Practical exercises • Oral tests • Written tests • Observation

	✓ Copying and Moving folders and files ✓ Setting file attributes • Local security policy settings ✓ Password policy ✓ Account lockout policy ✓ Audit policy ✓ Security options	

Suggested Methods of Instruction

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;
- Visiting lecturer/trainer from the ICT sector;
- Industrial visits.

Recommended Resources

Tools

- Windows Operating system

Equipment

- Computers

Materials and supplies

- Instructional materials
- Stationery

Reference materials

- Trainer-recommended resources including web resources