REPUBLIC OF KENYA

COMPETENCY BASED MODULAR CURRICULUM

FOR

COMPUTER SCIENCE

KNQF LEVEL 6

(CYCLE 3)

PROGRAMME ISCED CODE: 0613 554 A.

TVET CDACC
P.O. BOX 15745-00100
NAIROBI

OPERATING SYSTEMS CONFIGURATION

ISCED UNIT CODE: 0613 554 02A

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

Relationship to Occupational Standards

This unit addresses the unit of competency: Configure Operating Systems

Duration of Unit: 240 hours

Unit Description:

This unit covers the competencies required to understand operating systems. It involves understanding fundamentals of operating systems, applying computer application softwares to solving tasks, understanding process management, understanding memory management, understanding input-output management and understanding file management.

Summary of Learning Outcomes:

Learning Outcomes	Durations (Hours)
1. Computer application software to solving tasks	70
2. Process management	25
3. Memory management	25
4. Input and output management	40
5. File management and local policy settings	40
TOTAL	**240**

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Fundamentals of operating systems	1.1 Computer software 1.1.1 Definition 1.1.2 Classification 1.2 Operating system	• Practical exercises • Oral tests • Written tests • Observation

	1.2.1 Definition 1.2.2 Concepts 1.2.3 Functions of operating system are identified. 1.3 Operating system structures 1.3.1 Monolithic 1.3.2 Layered 1.3.3 Virtual 1.3.4 Client-server model 1.4 Types of operating systems 1.5 Requirements for Windows OS installation 1.6 Demonstration of Windows installation 1.6.1 Specify hardware requirements 1.6.2 Back up data in target machine 1.6.3 Partition creation and/or formatting 1.6.4 Installation as per vendor instructions 1.6.5 Testing installation	
2. Computer application software for solving tasks	2.1 Word processing 2.1.1 Functions and concepts of word processing. 2.1.2 Documents and tables creation and manipulations 2.1.3 Mail merging 2.1.4 Word processing utilities 2.1.5 Printing 2.2 Presentation Packages;	• Oral questioning • Project • Practical tests • Written tests

	2.2.1 Types of presentation Packages 2.2.2 Creating, formulating, running, editing, printing and presenting slides and handouts 2.3 Spread sheets 2.3.1 Meaning, formulae, function and charts, uses and layout 2.3.2 Data formulation, manipulation and application to cells 2.3.3 Printing 2.4 Database design and manipulation 2.4.1 Database design, data manipulation, sorting, indexing, storage retrieval and security 2.5 Data manipulation, storage and retrieval 2.6 Office Internet and Electronic mail; 2.6.1 Office internet Connectivity 2.6.2 Internet Browsing 2.6.3 Electronic mail	
3. Process management	3.1 Process management 3.1.1 Definitions: Process, Thread, Process Control Block 3.1.2 Functions of the Process Manager 3.2 Computer Resources	• Practical exercises • Oral tests • Written tests • Observation

	3.3 Process states and their transition 3.3.1 States: Ready, Waiting, Complete, Running 3.3.2 Transitions: Dispatch, Suspend, Exit, Resume 3.4 Process scheduling 3.4.1 Features of scheduling algorithms 3.4.2 Types of schedulers 3.4.3 Scheduling algorithms 3.5 Demonstration of Task Manager 3.5.1 Observing CPU queue 3.5.2 Stopping CPU intensive processes. 3.6 Performance monitor tools in process management	
4. Memory management	4.1 Memory Management 4.1.1 Definition 4.1.2 Objectives of Memory management 4.1.3 Components of the Memory Management unit 4.2 Memory management techniques 4.2.1 Partitioning 4.2.2 Virtual memory: 4.2.3 Paging, Segmentation 4.3 Demonstration of virtual memory settings – Increasing the Windows page file size	• Practical exercises • Oral tests • Written tests • Observation
5. Input and output management	5.1 Input - output management 5.1.1 Definition	• Practical exercises • Oral tests • Written tests

	5.1.2 Objectives of I/O management 5.1.3 I/O hardware 5.1.4 I/O software 5.1.5 Polling Vs Interrupt drive I/O 5.2 Disk operations 5.2.1 Access time factors 5.2.2 Techniques for resolving slow disk I/O 5.3 Computer clock system 5.3.1 Virtual Input Output 5.3.2 Definition of Virtual I/O 5.3.3 Types of virtual I/O: Buffering, Spooling, Caching 5.4 Disk selection criteria 5.4.1 Size 5.4.2 Speed 5.5 Demonstration of disk storage management operations 5.5.1 Formatting volume 5.5.2 Partitioning volume 5.5.3 Shrinking volume 5.5.4 Extending volume 5.5.5 Optimising and defragmenting disk 5.5.6 Changing drive security permissions 5.5.7 Backing up 5.5.8 Copying data to optical disks 5.6 Handling removable media	• Observation

	5.6.1 Demonstration of device management operations using Windows Device Manager 5.6.2 Verifying installed drivers 5.6.3 Resolving driver conflicts	
6. File management	6.1 File management 6.1.1 Definition 6.1.2 Objectives of file manager 6.1.3 File naming concepts 6.2 File access methods 6.2.1 Sequential access 6.2.2 Direct/Random access 6.2.3 Indexed sequential access 6.3 File allocation techniques 6.3.1 Contiguous 6.3.2 File Allocation 6.3.3 Indexed 6.4 File protection and security 6.4.1 Importance 6.4.2 Access control 6.4.3 Audit trial 6.5 File and directory operations 6.5.1 Creating folders and files 6.5.2 Renaming folders and files 6.5.3 Deleting folders and files 6.5.4 Copying and Moving folders and files 6.5.5 Setting file attributes 6.6 Local security policy settings 6.6.1 Password policy 6.6.2 Account lockout policy	• Practical exercises • Oral tests • Written tests • Observation

	6.6.3 Audit policy 6.6.4 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 for 25 trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Trainee: Item)
1	**Learning Materials**	OS & Application Software textbook / printed notes	25 copies	1:1
2		Training manual	25 copies	1:1
3		Worksheets, quizzes, and assignments	25 sets	1:1
4	**Learning Facilities**	Training room with seating and power sockets	For 25 trainees + 1 instructors	N/A
5		Whiteboard/Smartboard with markers or projector	1	1 per class
6	**Infrastructure**	Reliable electricity and backup (UPS or generator)	1 setup	Shared
7		Networked computer lab with LAN/internet access	1 lab	Shared
8		Server system for demo	1	1 per lab

9	**Tools & Equipment**	Desktop/Laptop computers	25	1:1
10		Printer (LaserJet or Inkjet)	1–2	10–15:1
11		Projector and screen	1	1 per class
12		External storage (USBs or external HDDs)	10	2–3:1
13		Optical drives (USB DVD writer)	5	5:1
14		Network Switch + Cables	1 setup	Shared
15		Internet Connectivity (Wi-Fi or wired LAN)	1 setup	Shared
16		Office application software (MS Office / LibreOffice)	25 licenses	1:1
17		Virtualization software (VMware, VirtualBox)	25 installations	1:1
18		Operating Systems (Windows/Linux ISO images)	25 copies	1:1
19		Antivirus software	25 licenses	1:1
20	**Consumable Materials**	Writing pads, pens	25 sets	1:1
21		Printer ink and paper	As required	Shared
22		Backup media (DVDs, USB sticks)	25	1:1
23	**Instructor Materials**	Instructor laptop with teaching software	1	1:1
24		Lesson plans, slides, and teaching aids	1 set	1:1
25	**Support Tools**	Windows Device Manager & Task Manager tools	Installed on each system	1:1

26		Performance Monitor, Disk Management tools	Installed on each system	1:1