

MODULE I

Unit Category	Unit Code	TVET CDACC UNIT CODE	Unit Name	Unit Duration (Hours)
COMMON	0611 441 03A	ICT/CU/SD/CC/01/5/MA	COMPUTER OPERATIONS	90
COMMON	0613 451 06A	ICT/CU/SD/CC/02/5/MA	STRUCTURED PROGRAMMING	220
CORE	0611 451 07A	ICT/CU/SD/CR/01/5/MA	SOFTWARE SYSTEM REQUIREMENTS	110
			TOTAL	420

COMPUTER OPERATIONS

ISCED UNIT CODE: 0611 441 03A

TVET CDACC UNIT CODE: ICT/CU/SD/CC/01/5/MA

Duration of Unit: 90 hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply Computer Operations

Unit Description

This unit covers the competencies required to apply computer operations. It involves processing computerized word documents, manipulating computerized spreadsheets, maintaining computerized databases, prepare presentation slides, manipulating graphic application and performing online collaboration.

Summary of Learning Outcomes

Learning Outcomes	Duration (Hours)
1. Process computerized word document	20
2. Manipulate computerized spreadsheet	25
3. Maintain computerized database	15
4. Prepare Power point presentation	10
5. Manipulate graphic application	10
6. Perform online collaboration	10
TOTAL	90

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Process computerized word document	1.1 Ergonomic risk factors 1.2 Operating Computer devices 1.2.1 Meaning and importance of computer	● Practical assessment ● Simulations ● Project ● Observation Checklist

	1.2.2 Functions and Uses of Computers 1.2.3 Classification of computers 1.2.4 Components of a computer system 1.2.5 Computer Hardware 1.2.5.1 The System Unit 1.2.5.2 Input Devices 1.2.5.2.1 Mouse use techniques 1.2.5.2.2 Keyboard Parts and Use Techniques 1.2.5.3 Output Devices 1.2.5.4 Storage Devices 1.2.5.5 Computer Ports 1.2.6 Procedure for turning/off a computer 1.2.7 Desktop Customization 1.2.8 File and Files Management using an operating system 1.2.9 Computer external devices management 1.3 Creation of computerized word document 1.3.1 Introduction to word document 1.3.2 Types of word processors 1.3.3 Creating word document 1.4 Editing and formatting word document 1.3.4 Word document editing features 1.3.4.1 Text editing 1.3.4.2 Paragraph editing 1.3.4.3 Document editing 1.4.1 Word document formatting features 1.3.4.4 Text formatting 1.3.4.5 Paragraph formatting 1.3.4.6 Document formatting	● Product Checklist ● Written assessment ● Portfolio of evidence
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	1.4.2 Enhancing productivity 1.3.4.7 Set basic options/ preferences 1.3.4.8 Help resources 1.3.4.9 Use magnification/zoom tools 1.3.4.10 Display, hide built-in tool bar 1.5 Mail merge 1.5.1 Mail merge preparation 1.5.2 Mail merge output 1.6 Printing of computerized word document 1.6.1 Print setup 1.6.2 Printing	
2. Manipulate computerized spreadsheet	2.1 Creation of Computerized spreadsheet workbook 2.1.1 Spreadsheet concepts 2.1.2 Elements of spreadsheet window 2.1.2.1 Worksheet 2.1.2.2 workbook 2.1.2.3 Rows 2.1.2.4 columns 2.1.2.5 Cells 2.2 Cell referencing 2.2.1.1 Relative cell referencing 2.2.1.2 Absolute cell referencing 2.2.1.3 Mixed cell referencing 2.2.2 Spreadsheet editing features 2.2.2.1 Worksheet editing 2.2.2.2 Inserting	● Practical assessment ● Simulations ● Project ● Observation Checklist ● Product Checklist ● Written assessment ● Portfolio of evidence

	- rows/columns 2.2.2.3 Removing - rows/columns 2.2.2.4 Adjusting row - heights and column width 2.2.2.5 Inserting worksheets 2.2.2.6 Renaming - worksheets 2.2.2.7 Move or copy - worksheets 2.2.2.8 Deleting worksheets 2.2.3 Data manipulation in spreadsheets 2.2.3.1 Data entry 2.2.3.2 Types of data	
	2.3 Formulas and functions 2.3.1.1 Formulas and - functions syntax 2.3.1.2 Arithmetic functions 2.3.1.3 logical functions 2.3.1.4 Look up functions 2.3.2 Computerized spreadsheet - worksheet formatting 2.3.2.1 Font styles 2.3.2.2 Alignment 2.3.2.3 Borders and shading 2.3.2.4 Header and footer	
	2.4 Charts generation 2.4.1.1 Types of charts 2.4.1.2 Insert charts 2.4.1.3 Labelling and - Editing charts 2.4.1.4 Computerized - spreadsheet	

	workbook printing 2.4.1.5 Print setup 2.4.1.6 Printing	
3. Maintain computerised database	3.1 Computerised database user requirements collection 3.1.1 Introduction to database 3.1.1.1 Key concepts 3.1.1.2 Database organisation 3.1.1.3 Database relationships 3.1.1.4 Database operations 3.1.2 Collection of User requirements 3.2 Design Computerised database schema 3.2.1 Creating database models 3.2.1.1 ERD models 3.2.1.2 Relational models 3.3 Creation of Computerised database objects 3.3.1 Database Objects 3.3.1.1 Tables 3.3.1.2 Records 3.3.1.3 Fields 3.3.1.4 Keys 3.3.1.5 Forms 3.3.1.6 Queries 3.3.1.7 Reports 3.4 Data manipulation 3.4.1 Inserting records 3.4.2 Retrieving records 3.4.3 Deleting records 3.4.4 Updating record 3.4.5 Printing database objects 3.4.5.1 Tables 3.4.5.2 Forms	● Practical assessment ● Simulations ● Project ● Observation Checklist ● Product Checklist ● Written assessment ● Portfolio of evidence

	3.4.5.3 Queries 3.4.5.4 Reports	
4. Prepare Power point presentation	4.1 Collection of Presentation requirements 4.1.1 Definition of terms 4.2.1 Presentation requirements 4.2.2 Types of presentation software 4.2.3 Elements of presentation window 4.2.4 Manipulating presentations 4.2.4.1 Create a PowerPoint presentation 4.2.4.2 Save a PowerPoint presentation 4.2.5 Working with presentations 4.2.5.1 Switch between open PowerPoint presentations 4.2 Design presentation layout 4.2.1 Types of presentation layout 4.2.2 Factors to consider when designing presentation layout 4.3 Creation of a Slide 4.3.1 Slide views 4.3.2 Slide designs 4.3.3 Slide transition 4.4 Manipulation of a slide 4.4.1 Adding data/text to a slide 4.4.2 Slide animation 4.4.3 Formatting data/text 4.4.4 Move/copy/delete a slide 4.4.5 Inserting header and footer 4.4.6 Presentation objects	● Practical assessment ● Simulations ● Project ● Observation Checklist ● Product Checklist ● Written assessment ● Portfolio of evidence

	4.2.5.2 Tables 4.2.5.3 charts 4.4.7 Print setup 4.2.5.4 Printing PowerPoint presentation	
5. Manipulate graphic application	5.1 Collecting graphic design requirements 5.1.1 Definition of terms 5.1.2 Graphic application requirements 5.1.3 Types of graphic application software 5.1.4 Types of publications designs 5.1.4.1 Templates 5.1.4.2 Banners 5.1.4.3 Booklets 5.1.4.4 Brochures 5.1.4.5 Flyers 5.1.4.6 Posters 5.1.4.7 Cards 5.1.4.8 Certificates 5.1.4.9 Magazines 5.1.5 Elements of Graphic application window 5.2 Creation of graphic design 5.2.1 Perform basic tasks using graphic application software 5.2.1.1 Publication type 5.2.1.2 Page setup 5.2.1.3 Ruler/guides 5.2.1.4 Page views 5.2.2 Add content to a publication 5.2.3 Edit content to a publication 5.2.4 Format text and paragraphs in a publication	● Practical assessment ● Simulations ● Project ● Written assessment ● Portfolio of evidence

	5.2.5 Page formatting in a publication 5.2.5.1 Columns 5.2.5.2 Borders and shading 5.2.5.3 Headers and footers 5.2.5.4 Background 5.2.5.5 Watermarks 5.2.5.6 Orientation 5.2.6 Work with graphics objects in a publication 5.2.6.1 Textbox 5.2.6.2 Tables 5.2.6.3 Shapes 5.2.6.4 Pictures 5.2.6.5 (PNG, JPEG, GIF) 5.3 Publishing of graphic design 5.3.1 Prepare a publication 5.3.2 Print setup 5.3.3 Printing publication	
6. Perform Online Collaboration	6.1 Identification of Online collaboration tools 6.1.1 Definition of online collaboration 6.1.2 Importance of online collaboration 6.1.3 Factors to consider when choosing an online collaboration tool 6.1.4 Online collaboration tools 6.1.4.1 Microsoft teams 6.1.4.2 Skype 6.1.4.3 Google drive 6.1.4.4 Zoom 6.1.4.5 Google meet 6.1.4.6 Slack 6.2 Online collaboration preparation	● Practical assessment ● Simulations ● Project ● Observation Checklist ● Product Checklist ● Written assessment ● Portfolio of evidence

	6.2.1 Online collaboration key concepts 6.2.2 Common setup features 6.2.2.1 Download software to support online collaboration tools 6.2.2.2 Register and/ or set a user account 6.2.3 Preparation for online collaboration	
	6.3 Application of online collaborative tools 6.3.1 Using online collaborative tools 6.3.1.1 Online storage media 6.3.1.2 Using email 6.3.1.2.1 Sending and receiving email 6.3.1.2.2 Tools and settings 6.3.1.2.3 Organizing email 6.3.1.3 Using calendars 6.3.1.4 Online calendars 6.3.1.5 Social media 6.3.1.6 Online learning environment 6.3.1.7 Synchronization tools	
	6.4 Demonstrating Mobile collaborations 6.4.1 Key concepts in mobile applications 6.4.2 Mobile applications permissions 6.4.3 Synchronization	

Suggested Delivery Methods

- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos
- Group discussions
- Facilitation using active learning strategies

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Trainee: Item)
A	Learning Materials			
1.	Textbooks		5 pcs	5:1
2.	Installation manuals		5 pcs	5:1
3.	Flip Charts		5 pcs	5:1
4.	PowerPoint presentations	For trainer's use		
5.	Magazines/brochures/business cards			
B	Learning Facilities & infrastructure			
6.	Lecture/theory room		1	25:1
7.	Laboratory		1	25:1
C	Consumable materials			
8.	Printing papers		1 ream	1:20
9.	Foolscaps		1 ream	
10.	Toners/cartridges		2 pcs	13:1
11.	Assorted colour of			

	whiteboard markers			
D	Tools and Equipment			
12.	Computers		25 pcs	1:1
13.	Projector		1 pc	25:1
14.	Printers		2 pcs	1:13
15.	Whiteboard		1 pc	25:1
16.	Flash drives		5 pcs	5:1
17.	1 External Hard drive		1 pcs	25:1
18.	Application software suite		5 pcs	5:1

STRUCTURED PROGRAMMING

ISCED UNIT CODE: 0613 451 06A

TVET CDACC UNIT CODE: ICT/CU/SD/CC/02/5/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply Structured Programming

Duration of Unit: 220 Hours

Unit Description

This unit covers the competencies required to apply structured programming. It involves applying computer programming basics, writing program code, implementing program logic and implementing modular programming.

Summary of Learning Outcomes

Learning Outcomes	Duration (Hours)
1. Apply Computer Programming basics	30
2. Write program Code	40
3. Implement Program logic	70
4. Implement modular programming	80
TOTAL	220

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply Computer Programming basics	1.1. Programming Language Types 1.1.1. Overview of programming language categories 1.1.2. procedural 1.1.3. object-oriented	● Practical Activities ● Project work ● Group work ● Observation ● Portfolio of Evidence

	1.1.4. functional 1.2. Programming Paradigms 1.2.1. Explanation of common programming paradigms (e.g., imperative, declarative) 1.2.2. Choosing the appropriate paradigm based on project needs 1.3. Program Development Life Cycle 1.3.1. Stages of the program development life cycle (e.g., planning, design, implementation) 1.3.2. Best practices for adapting the life cycle to work requirements 1.3.3. Overview of program design tools (e.g. algorithms, flowcharts, wireframes, pseudocodes, decision table/trees) 1.4. Selecting design tools based on user requirements and project complexity	● Written tests
2. Write program Code	2.1. Program Writing Tools 2.1.1. Common program writing tools and IDEs (e.g. codeblocks, Turbo C, Eclipse) 2.1.2. Evaluating tools based on system requirements and developer preferences 2.2. Declaring Identifiers 2.2.1. Types of identifiers 2.2.1.1. Variable, 2.2.1.2. Functions 2.2.1.3. Arrays. 2.2.2. Ensuring identifiers align with program design specifications 2.2.3. Creating a naming convention guide for different types of identifiers.	● Practical Activities ● Project work ● Group work ● Observation ● Portfolio of Evidence ● Written tests

	2.2.4. Evaluating identifier 2.3. Initializing Variables and Constants 2.3.1. Importance of proper initialization in programming 2.3.2. Techniques for initialization based on design specifications 2.3.3. Writing code snippets demonstrating correct and incorrect initialization. 2.3.4. Best coding practices 2.3.4.1. Creating Comments in a program 2.3.4.2. Indenting statement 2.3.4.3. Program blocks of code 2.3.5. Conducting a workshop on variable and constant initialization techniques.	
3. Implement Program logic	3.1. Application of Data types 3.1.1. Data types 3.2. Application of program data control structures 3.2.1. Loops 3.2.1.1. For loops 3.2.1.2. While loops 3.2.1.3. Do while loops 3.2.2. Conditionals statements 3.2.2.1. If statements 3.2.2.2. Case statements 3.2.3. Best practices for implementing control structures as per design requirements 3.2.4. Solving coding challenges that require the use of different control structures. 3.2.5. Creating flowcharts to visually represent control structures in a program. 3.3. Application of Data Structures 3.3.1. Overview of common data structures (e.g., arrays, linked lists) 3.3.2. Selecting appropriate data structures based on design specifications	● Practical Activities ● Project work ● Group work ● Observation ● Portfolio of Evidence ● Written tests

	3.3.3. Implementing various data structures in a programming language of choice. 3.3.4. Comparing performance metrics of different data structures in a small project.	
4. Implement modular programming	4.1. Creation of Subroutines 4.1.1. Benefits of using subroutines (e.g., modularity, reusability) 4.1.2. Designing subroutines to meet user needs 4.1.3. Functions and subprograms 4.1.3.1. In built functions 4.1.3.2. User defined functions 4.1.3.2.1. Function parameters 4.1.3.2.2. Function return types 4.1.4. Design and implement a subroutine library for common tasks. 4.1.5. Program to create subroutines based on given specifications. 4.2. Application of data structures in looping through arrays in a function 4.2.1. Using various looping control structures 4.2.1.1. For loop 4.2.1.2. While 4.2.1.3. Do .. while 4.3. Perform debugging 4.3.1. Common debugging techniques and tools 4.4. Compiling a program 4.4.1. Compiling a series of programs with intentional error to learn about error messages.	● Practical Activities ● Project work ● Group work ● Observation ● Portfolio of Evidence ● Written tests

Suggested Delivery Methods

- Instructor led facilitation using active learning strategies
- Demonstration by trainer
- Practical work by trainees
- Viewing of related videos
- Field Visits
- Group Work
- Role plays
- Group projects

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommend ed Ratio (Item: Trainee)
A	Learning Materials			
1.	Internet connection	✓ For each computer	1	1:1
2.	Flip charts	A1	1	1:25
3.	Textbooks	For reference	3	3:25
B	Learning Facilities & infrastructure			
4.	Computer Laboratory	To accommodate 25 Learners	1	1:25
5.	Theory Room	furnished with 25 Arm-chairs and a suitable trainer's table	1	1:25
C	Consumable materials			
6.	Printing papers	A4	2 Reams	1:12
7.	Toner / Ink bottles	For printers	2 pcs	1:12
8.	White board markers	Assorted colors	20	4:5
D	Tools and Equipment			
9.	Computers	✓ Genuine Windows/Linux ✓ Genuine Microsoft office Software	25	1:1

		✓ Google Workspace Account ✓ Antivirus Software ✓ Suitable IDE		
10.	External storage media	HDD / SSD / Flash	1	1:25
11.	Printer	Working printer	2	1:12
12.	1 Smart-board / Smart TV / Projector (with screen)	Where available	1	1:25
13.	Whiteboard/Chalkboard	4 X 8 Feet	1	1:25

SOFTWARE SYSTEM REQUIREMENTS

ISCED UNIT CODE: 0611 451 07A

TVET CDACC UNIT CODE: ICT/CU/SD/CR/01/5/MA

Duration of Unit: 110 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Establish Software System Requirements

UNIT DESCRIPTION

This unit covers the competencies required to establish software system requirements. It involves gathering user requirements, analyzing user requirements, and planning application deliverables.

Summary of Learning Outcomes

1. To gather user requirements
2. To analyze user requirements
3. To plan application deliverables

Learning Outcomes	Duration (Hours)
1. Gather user requirements	20
2. Analyze user requirements	40
3. Plan application deliverables	50
TOTAL	110

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Gather user requirements	1.1. Key project stakeholders 1.1.1. Project team 1.1.1.1. Team members & their roles 1.1.1.2. Project managers 1.1.2 System users 1.1.1.3. Developers 1.1.1.4. System Analysts 1.1.1.5. End-users 1.1.1.6. System Administrators 1.1.3 Organization management 1.1.1.7. Organization structure 1.2. Data collection tools 1.2.1 Methods of data collection 1.2.1.1. Questionnaires 1.2.1.2. Observations 1.2.1.3. Experimentation 1.2.1.4. Interviews 1.2.1.5. Surveys 1.2.1.6. Case Studies 1.2.3. Preparation of data collection tools 1.2.3.1. Questionnaires 1.2.3.2. Observations checklist 1.2.3.3. Interviews Questions	● Practical Activities ● Project work ● Demonstration ● Group Work ● Role Plays ● Observation ● Third Party report ● Portfolio of Evidence ● Written tests

	1.3. Collection of user requirements data: 1.3.1. Questionnaires 1.3.2. Observations 1.3.3. Experimentation 1.3.4. Interviews 1.3.5. Surveys 1.3.6. Case Studies	
2. Analyze user requirements	2.1. Types of user Requirements 2.1.1. Functional Requirements 2.1.2. Non-Functional Requirements 2.1.3. Technical Requirements 2.1.4. Budget and Timeline 2.1.5. Legal and Regulatory Requirements 2.2. Identification of System application requirements. 2.2.1. Purpose and Goals 2.3. Analysis of system application requirements 2.3.1. Feasibility Analysis: 2.3.2. Requirements Prioritization 2.3.3. Functional Analysis 2.3.4. Non-functional Analysis 2.3.5. Design Analysis 2.3.6. Risk Analysis 2.4. Documenting system application requirements specifications process	● Practical Activities ● Project work ● Demonstration ● Group Work ● Role Plays ● Observation ● Third Party report ● Portfolio of Evidence ● Written tests

	2.4.1. Functional Requirements 2.4.2. Non-Functional Requirements 2.4.3. Design Requirements 2.4.4. Technical Requirements 2.4.5. Assumptions and Constraints 2.4.6. Glossary 2.4.7. Appendices 2.4.8. Reviewing and revising system application requirement specifications.	
3. Plan application deliverables	3.1. System requirement Review Process 3.1.1. Review Criteria: 3.1.1.1. Traceability 3.1.1.2. Change Management 3.1.1.3. Version Control: 3.1.1.4. Testing and Validation 3.1.2. Legal Issues 3.1.2.1. Governing laws and international treaties 3.1.2.2. End-User License Agreement 3.1.3. Dispute resolution 3.1.4. Termination of Contracts 3.2. Creating a Project work plan 3.2.1. Project Scope 3.2.2. Key deliverables 3.2.2.1. Internal deliverables 3.2.2.2. External deliverables	• Practical Activities • Project work • Demonstration • Group Work • Role Plays • Observation • Third Party report • Portfolio of Evidence • Written tests

	3.2.3. Milestones 3.2.4. Timelines 3.2.5. Duties and responsibilities 3.2.6. Quality criteria definition 3.2.7. Constraints and dependencies 3.2.8. Resource sharing 3.2.9. Communication planning 3.3. Project development agreement 3.3.1. Contents 3.3.2. Importance 3.3.3. Sign-off	
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Suggested Delivery Methods

- Instructor led facilitation using active learning strategies
- Demonstration by trainer
- Practical work by trainees
- Viewing of related videos
- Field Visits
- Group Work
- Role plays
- Group projects

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	Learning Materials			
1	Internet connection	✓ For each computer	1	1:1
	Flip charts	A1	1	1:25
	Textbooks	For reference	3	3:25

B	Learning Facilities & infrastructure			
	Theory Room	furnished with 25 Arm-chairs and a suitable trainer's table	1	1:25
C	Consumable materials			
	Printing papers	A4	2 Reams	1:12
	White board markers	Assorted colors	20	4:5
D	Tools and Equipment			
	Computers	✓ Genuine Windows/Linux ✓ Genuine Microsoft office Software ✓ Google Workspace Account ✓ Antivirus Software ✓ MS Project / Ms Visio ✓ Visual Paradigm ✓ Clickup	25	1:1
	External storage media	HDD / SSD / Flash	1	1:25
	Printer	Working printer	2	1:12
	1 Smart-board / Smart TV / Projector (with screen)	Where available	1	1:25
	Whiteboard/Chalkboard	4 X 8 Feet	1	1:25