

DEVELOP COMPUTER SOFTWARE

ISCED UNIT CODE: 0612554 12A

TVET CDACC UNIT CODE: SEC/CU/CS/CR/03/6/MA

Relationship to Occupational Standards

This unit addresses the unit of competency: Develop computer software

Duration of Unit: 200 hours

Unit Description

This unit covers the competencies required to develop computer software. It involves establishing software purpose, analysing software requirements, designing computer software, developing computer software, performing programme testing and maintenance.

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify the fundamentals to programming	1.1 Definition of terms 1.2 History of programming language 1.3 Level of programming languages 1.4 Types of programming languages 1.5 Programming paradigms 1.6 Hardware and Software considerations for object-oriented programming 1.7 Programming Development Life Cycle	• Observation • Oral questioning • Written tests • Practical tests
2. Design computer software	2.1 Program design tools 2.1.1 Pseudocodes 2.1.2 Algorithms 2.1.3 Flowcharts 2.1.4 Data Flow Diagrams	• Observation • Oral questioning • Practical tests • Written tests

Learning Outcome	Content	Suggested Assessment Methods
3. Develop computer software using an object-oriented programming language (JAVA, C++ or PYTHON)	3.1 Language structure 3.2 Features of OOP languages 3.2.1 Program writing using C++ or Python or java. 3.2.2 Basic syntax 3.2.2.1 Comments 3.2.2.2 Keywords 3.2.2.3 Importance of syntax in programming 3.2.2.4 Guidelines for naming conventions and best practices 3.3 Input and output statements 3.4 Variables 3.4.1 Types of variables 3.4.2 Variable declaration 3.4.3 Variable initialization 3.5 Data types 3.6 Operators 3.7 Program Control structures 3.7.1.1 Sequential 3.7.1.2 Selection 3.7.1.3 Switch statements 3.7.1.4 Iteration 3.8 Concepts in OOP 3.8.1 Objects and classes 3.8.2 Inheritance 3.8.3 Polymorphism 3.8.4 Encapsulation 3.8.5 Constructors 3.8.6 Operator overloading 3.9 Functions	• Observation • Oral questioning • Written tests • Practical tests

Learning Outcome	Content	Suggested Assessment Methods
	3.10 Methods 3.11 Data structures 3.11.1 Arrays 3.11.2 Pointers 3.11.3 Queues 3.11.4 Stack 3.11.5 Lists 3.11.6 Dictionaries 3.11.7 Tuples 3.12 File extensions in OOP 3.12.1 File stream 3.12.2 Features/properties 3.12.3 File operations 3.12.4 File handling	
4. Perform programme testing	4.1 Types of tests 4.1.1 Software functionality testing 4.1.2 Software security testing 4.2 Software debugging 4.3 Software reporting and testing 4.4 Quality assurance and testing	• Observation • Oral questioning • Written tests • Practical tests
5. Perform software implementation and maintenance	5.1 Meaning of terms 5.2 User acceptance and implementation 5.3 Preparation of software maintenance schedule 5.4 Software patch management 5.5 Software version control 5.6 Software review 5.7 Software monitoring and evaluation	• Observation • Oral questioning • Written tests • Practical tests

Suggested Delivery Methods

- In Instructor led facilitation of theory

- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos
- Group discussions

Recommended resources for 25 trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Trainee: Item)
A	Learning Materials			
1.	Textbooks		13 pcs	13:1
2.	Installation manuals		5pcs	5:1
3.	Charts			
4.	PowerPoint presentations	For trainer's use		
B	Learning Facilities & infrastructure			
5.	Lecture/theory room		1	25:1
6.	Computer Laboratory		1	25:1
7.	Internet Connection			
C	Consumable materials			
8	Printing papers		1 ream	1:20
9.	Toners		2 pcs	13:1
10.	Assorted colour of whiteboard markers			
D	Tools and Equipment			
11.	Computers		25 pcs	1:1
12.	Projector		1 pc	25:1
15.	Visual Studio Code (VS Code)		25pc	1:1

MODULE VI

INDUSTRY TRAINING	480	48
Total hours	480	48

INDUSTRY TRAINING

An individual enrolled in this course will be required to undergo Industry training for a minimum period of 480 hours in Cyber Security Sector upon completion of Module IV. The industrial training may be taken after completion of all units for those pursuing the full qualification or be distributed equally in each unit for those pursuing part qualification. In the case of dual training model, industrial training shall be as guided by the dual training policy