

DESKTOP APPLICATION DEVELOPMENT

ISCED UNIT CODE: 0613 551 03 A

TVET CDACC UNIT CODE: ICT/CU/SD/CR/02/6/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Develop Desktop Application

Duration of Unit: 240 Hours

UNIT DESCRIPTION

This unit covers the competencies required to develop desktop application. It involves designing desktop application, writing desktop application source code, debugging desktop application, testing desktop application and deploying desktop application.

Summary of Learning Outcomes

Learning Outcomes	Duration (Hours)
1. To design desktop application	60
2. To write desktop application source code	60
3. To debug desktop application	40
4. To test desktop application	50
5. To deploy desktop application	30
TOTAL	240

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Design desktop application	1.1. Desktop application design tools 1.1.1. Basic desktop application programming concepts 1.1.1.1. Events 1.1.1.2. Objects 1.1.1.3. Controls 1.1.1.4. Methods 1.1.2. Application development stages 1.1.3. Identifying Desktop Application Design Tools 1.1.4. Overview of desktop application design tools 1.1.5. Criteria for selecting tools 1.1.6. Case studies of tool selection in real-world applications 1.2. Designing Application Functionality 1.2.1. Techniques for gathering user requirements 1.2.2. Mapping user needs to application features 1.2.3. Prioritizing functionality based on user feedback 1.3. Creating the Application Interface 1.3.1. Principles of effective user interface design 1.3.2. Creating wireframes and prototypes 1.3.3. User testing and feedback incorporation	● Practical Activities ● Project work ● Demonstration ● Group Work ● Observation ● Portfolio of Evidence ● Written tests

	1.4. Designing Application Output 1.4.1. Types of application output (reports, visualizations) 1.4.2. Qualities of a good system user output 1.4.3. Methods for testing and validating system output	
2. Write desktop application source code	2.1. Identifying Development Tools 2.1.1. Overview of desktop application development tools 2.1.2. Visual Studio, Netbeans, JetBrains 2.1.3. Criteria for selecting tools based on system requirements 2.1.4. Examples of popular development environments (e.g., Visual Studio, Netbeans, JetBrains) 2.1.5. Parts of Integrated Development Environment 2.1.6. Types of controls and objects 2.1.6.1. Buttons 2.1.6.2. Textboxes 2.1.6.3. Labels 2.1.6.4. Combobox 2.1.6.5. Datagrid 2.1.6.6. Listview 2.1.6.7. Forms 2.2. Developing Application Interface 2.2.1. Implementing the interface design as per specifications	● Practical Activities ● Project work ● Demonstration ● Group Work ● Observation ● Portfolio of Evidence ● Written tests

	2.2.2. Using design patterns and frameworks (e.g., MVC) 2.2.3. Ensuring user experience (UX) best practices are followed 2.3. Designing the Database 2.3.1. Understanding user needs for data management 2.3.2. Choosing the right database model (e.g., relational vs. NoSQL) 2.3.3. Creating data schemas and relationships 2.4. Database Integration 2.4.1. Techniques for integrating databases with applications 2.4.2. Ensuring data consistency and integrity eg datafield constraints 2.4.3. Using APIs and ORM (Object-Relational Mapping) tools 2.5. Implementing Application Functionality 2.5.1. Writing source code to meet user requirements 2.5.2. Testing functionality through unit and integration tests 2.5.3. Iterative development and user feedback incorporation 2.6. Observing Workplace Safety and Health Practices 2.6.1. Overview of OSHA regulations relevant to software development 2.6.2. Best practices for maintaining a safe workplace 2.6.3. Importance of ergonomics and safe equipment usage	
--	---	--

	2.7. Identifying E-Waste Storage and Disposal Methods 2.7.1. Understanding e-waste regulations as per OSHA 2.7.2. Proper storage techniques for electronic waste 2.7.3. Safe disposal methods and recycling options 2.8. Demonstrating E-Waste Management 2.8.1. Implementing e-waste management practices in the workplace 2.8.2. Training staff on e-waste handling and disposal 2.8.3. Monitoring and reporting e-waste management efforts	
3. Debug desktop application	3.1. Checking Source Code for Bugs and Errors 3.1.1. Techniques for static code analysis 3.1.2. Manual code review practices 3.2. Performing Debugging with Tools 3.2.1. Overview of popular debugging tools (e.g., GDB, Visual Studio Debugger) 3.2.2. Best practices for using debugging tools effectively 3.2.2.1. Breakpoints 3.2.2.2. Step options 3.2.2.3. Running commands eg Break, Pause & Stop 3.2.2.4. Examining variables & expressions 3.3. Conducting Regression Testing 3.3.1. Types of regression testing (e.g., automated vs. manual) 3.3.2. Strategies for identifying test cases	• Practical Activities • Project work • Demonstration • Group Work • Observation of Evidence • Written tests

	for regression 3.4. Documenting Source Code Changes 3.4.1. Importance of version control systems (e.g., Git) 3.4.2. Best practices for maintaining clear and concise documentation	
4. Test desktop application	4.1. Identifying Testing Types 4.1.1. Testing types 4.1.1.1. Unit test 4.1.1.2. Integration test 4.1.1.3. Usability test 4.1.1.4. System testing 4.1.1.5. Security test 4.1.1.6. Performance test 4.1.1.7. Compatibility test 4.1.2. Selecting appropriate testing types based on user requirements 4.2. Preparing Test Plan 4.2.1. Key components of a test plan (e.g., objectives, scope, resources) 4.2.2. Best practices for aligning the test plan with work procedures 4.3. Executing Tests as per Test Plan 4.3.1. Methods for executing various tests (manual vs. automated) 4.3.2. Tracking test progress and issues during execution 4.4. Preparing the Test Report 4.4.1. Essential elements of a test report (e.g., findings, recommendations) 4.4.2. Best practices for documenting results according to work procedures	• Practical Activities • Project work • Demonstration • Group Work • Observation • Portfolio of Evidence • Written tests
5. Deploy desktop	5.1. Identifying Deployment Strategy 5.1.1. Overview of deployment strategies	• Practical Activities

applicatio n	(e.g., phased, big bang) 5.1.2. Factors influencing the choice of deployment strategy based on work procedures 5.2. Identifying Deployment Tools 5.2.1. Overview of popular deployment tools (e.g., InstallShield, NSIS) 5.2.2. Evaluating tools based on user requirements and application needs 5.3. Packaging the Application 5.3.1. Best practices for creating installation packages 5.3.2. Ensuring compliance with application requirements (e.g., dependencies, configurations) 5.4. Distributing the Application 5.4.1. Methods for distributing applications (e.g., direct download, app stores) 5.4.2. Ensuring distribution aligns with established work procedures	• Project work • Demonstration • 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	Recommended Ratio (Item: Trainee)
A	Learning Materials			
27.	Internet connection	✓ For each computer	1	1:1
28.	Flip charts	A1	1	1:25
29.	Textbooks	For reference	3	3:25
B	Learning Facilities & infrastructure			
30.	Computer Laboratory	To accommodate 25 Learners	1	1:25
31.	Theory Room	furnished with 25 Arm-chairs and a suitable trainer's table	1	1:25
C	Consumable materials			
32.	Printing papers	A4	2 Reams	1:12
33.	Toner / Ink bottles	For printers	2 pcs	1:12
34.	White board markers	Assorted colors	20	4:5
D	Tools and Equipment			
35.	Computers	✓ Genuine Windows/Linux ✓ Genuine Microsoft office Software ✓ Google Workspace Account ✓ Antivirus Software ✓ Suitable IDE	25	1:1
36.	External storage media	HDD / SSD / Flash	1	1:25
37.	Printer	Working printer	2	1:12
38.	1 Smart-board / Smart TV / Projector (with screen)	Where available	1	1:25
39.	Whiteboard/Chalkboard	4 X 8 Feet	1	1:25