

COMPUTERIZED DATABASE SYSTEMS

ISCED UNIT CODE: 0612 451 08A

TVET CDACC UNIT CODE: IT/CU/ICTA/CR/03/5/MA

Duration of Unit: 200 Hours

Relationship to Occupational Standards

This unit addresses the unit of competency: Manage Computerized Database Systems

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Unit Description:

This unit covers the competencies required to manage computerized database systems. It involves designing computerized database, creating computerized database, manipulating computerized database, testing computerized database and maintaining computerized database.

Summary of Learning Outcomes:

Learning Outcomes	Durations (Hours)
1. Design computerized database.	30
2. Create a computerized database.	60
3. Manipulate computerized database.	60
4. Test computerized database.	30
5. Maintain computerized database.	20
Total Hours	200

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Method
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1. Design computerized database.	1.1 Establishing computerized database requirements 1.1.1 Introduction to DBMS 1.1.1.1 Definition of terms 1.1.1.2 Functions of database systems 1.1.1.3 Database applications 1.1.1.4 Types of database management system 1.1.1.5 Major components of the DBMS environment. 1.1.1.6 Database architecture 1.1.2 Database requirements gathering techniques 1.1.2.1 Database requirement elicitation 1.1.2.2 Database assessment requirement report 1.2 Database models 1.2.1 Relational Models 1.2.2 Hierarchical models 1.2.3 Network Models 1.2.4 Object-oriented models 1.2.5 Dimensional model 1.3 Database design 1.3.1 Conceptual design 1.3.2 ERDs 1.3.2.1 Types of entities and notations	• Practical assessment • Project • Observation Checklist • Product Checklist • Written assessment • Portfolio of evidence
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	1.3.2.2 Types of attributes and notations 1.3.2.3 Types of relationship and notation 1.3.3 Relational model 1.3.4 Logical design 1.3.4.1 Define tables 1.3.4.2 Keys 1.3.4.3 Normalization 1.3.5 Physical design 1.3.5.1 Selection of data types 1.3.5.2 Indexing 1.3.5.3 constraints	
2. Create computerized database.	2.1 Creation of database objects 2.1.1 Database objects 2.1.1.1 Tables 2.1.1.2 Forms 2.1.1.3 Queries 2.1.1.4 Reports 2.1.1.5 Macros 2.1.2 Fields 2.1.2.1 Records 2.1.2.2 Data types 2.1.2.3 Field properties 2.1.2.4 Keys 2.2 Database development 2.2.1 Creation of tables 2.2.2 Linking of tables 2.2.3 Creation of Queries 2.2.4 Creation of forms 2.2.5 Creation of reports 2.2.6 Integrity constraints	• Practical assessment • Project • Observation Checklist • Product Checklist • Written assessment • Portfolio of evidence

	2.2.6.1 Nulls 2.2.6.2 Entity Integrity 2.2.6.3 Referential Integrity 2.2.6.4 General Constraints 2.2.7 Database indexing 2.2.7.1 Primary indexing 2.2.7.2 Secondary indexing 2.3 Data relationships 2.3.1.1 A one-to-one relationship 2.3.1.2 one-to-many relationship 2.3.1.3 Many-to-one relationship 2.3.1.4 A many-to-many relationship	
3. Manipulate computerized database.	3.1 Database population 3.1.1 Database operations 2.3.1.5 Insert 2.3.1.6 Select 2.3.1.7 Update 2.3.1.8 Delete 3.2 Data retrieval 3.2.1 Database Querying Languages – SQL 2.3.1.9 Introduction to SQL 2.3.1.10 Writing SQL commands 2.3.1.11 SQL Views 3.3 Database report Generation 3.3.1 Generate report 3.3.2 Edit report 3.3.3 Format report	• Practical assessment • Project • Observation Checklist • Product Checklist • Written assessment • Portfolio of evidence

	3.3.4 Apply header and footer 3.3.5 Print report	
4. Test computerized database.	4.1 Test plan development 4.1.1 Importance of database testing 4.1.2 Types of database testing 4.1.2.1 Structural DB testing 4.1.2.1.1 Schema 4.1.2.1.2 Table and column 4.1.2.2 Functional testing 4.1.2.2.1 Whitebox 4.1.2.2.2 Blackbox 4.1.2.3 Stored procedure 4.1.2.4 Non-functional testing 4.1.2.4.1 Load testing 4.1.2.4.2 Stress testing 4.2 Prepare test data 4.3 Perform database testing using test data 4.3.1 Validate database results 4.4 Generate test report 4.4.1 Importance of test reports 4.4.2 Prepare test report	• Practical assessment • Project • Observation Checklist • Product Checklist • Written assessment • Portfolio of evidence
5. Maintain computerized database.	5.1 Database optimization 5.1.1 Introduction to database optimization 5.1.2 Query optimization techniques 5.1.3 Indexing strategies 5.1.4 Partitioning and storage management	• Practical assessment • Project • Observation Checklist • Product Checklist • Written assessment • Portfolio of evidence

	5.2 Computerized database maintenance schedule preparation 5.2.1 Types of Database maintenance techniques 5.2.2 Database maintenance schedule preparation 5.2.3 Key elements in preparation of maintenance schedule 5.2.4 Computerized database backup and recovery 5.3 Computerized database monitoring 5.3.1 Computerized database monitoring tools 5.3.2 Resource Utilization 5.3.3 Query Performance 5.3.4 Transaction log monitoring 5.3.5 Connection monitoring 5.3.6 Alerting systems 5.4 Generation of Computer database maintenance report	
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Suggested Delivery Methods

- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos
- Group discussions
- Direct instructions
- Instructor led 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	For trainee's use	5pcs	5:1
2.	Installation manuals	For trainer's use		
3.	Charts	For trainer's use		
4.	PowerPoint presentations	For trainer's use		
B	Learning Facilities & infrastructure			
1.	Lecture/theory room	For training	1	25:1
2.	Computer Laboratory	For training	1	25:1
C	Consumable materials			
3.	Printing papers	For printing	1 ream	1:20
4.	Toners	For printers	2 pcs	13:1
5.	Assorted colour of whiteboard markers	For trainer's use		
D	Tools and Equipment			
6.	Computers	For training	25 pcs	1:1
7.	Projector	For trainer's use	1pc	25:1
8.	Printers	For printing	5 pcs	5:1
9.	Whiteboard	For trainer's use	1pc	25:1
10.	flash drives	For training	5 pcs	5:1
11.	External Hard drive	For training	5 pcs	5:1

12.	Microsoft Access	For training	25 pcs	1:1
13.	MYSQL	For training	25 pcs	1:1
14.	Test Data Generator	For training	25 pcs	1:1
15.	WAMP/XAMP	For training	25 pcs	1:1