DEMONSTRATE DATABASE MANAGEMENT SKILLS

UNIT CODE: ICT/OS/CS/CR/05/6/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate database management skills. It involves understanding database fundamentals, designing a database, using Structured Query Language, understanding design of object oriented databases, understanding indexing and hashing and understanding database applications.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the **key outcomes** which make up **workplace function**.	**PERFORMANCE CRITERIA** These are **assessable** statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the range.)***
1. Understand Database fundamentals	1.1 A database is defined 1.2 ***Terminologies used with databases*** are explained 1.3 Reasons of using databases are explained 1.4 Relational Model is defined 1.5 Key concepts in relational modelling are explained 1.6 Properties of a table/relation are explained 1.7 Relational Database Management Systems (RDBMSs) products are compared 1.8 Installation of MS SQL server is demonstrated 1.9 MS SQL server interface is explained 1.10 ***Properties of MS SQL server database*** are explained
2. Design a database	2.1 ***Phases of database design*** are explained 2.2 Entity modeling is illustrated using UML notation 2.3 Normalisation is demonstrated 2.4 Validation of the ER model is done according to the requirements
3. Use Structured Query Language	3.1 Structured Query Language (SQL) is explained 3.2 ***Data definition queries*** are explained 3.3 Creation of tables using the SQL CREATE TABLE statement is demonstrated 3.4 ***CREATE TABLE statement constraints*** are demonstrated

	3.5 The table schema is edited using the SQL ALTER statement 3.6 A table is dropped using the SQL DROP TABLE statement 3.7 ***Data manipulation query statements*** are demonstrated. 3.8 SQL joins are explained 3.9 Database is created and queried from validated ER model 3.10 ***Types of joins*** are demonstrated
4. Understand design of object oriented databases	4.1 An object oriented database is explained. 4.2 ***Object oriented database concepts*** are explained. 4.3 Object Oriented database concepts are implemented from a set of requirements. 4.4 Creating of **views and triggers** in object oriented databases is demonstrated.
5. Understand indexing and hashing	5.1 Indexing and hashing are explained. 5.2 Indexing in databases is demonstrated. 5.3 Hashing in databases is demonstrated. 5.4 Indexing and hashing is implemented in an existing database
6. Understand Database applications	6.1 Decision support systems are explained. 6.2 Data mining is explained 6.3 Distributed databases are demonstrated 6.4 Data warehousing is illustrated 6.5 Spatial and geographical databases are explained 6.6 Multi-media databases are illustrated 6.7 Mobility and personal databases are explained. 6.8 Data warehouses are designed and implemented from a given set of requirements.

RANGE

This section provides work conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	**Range**
1. Terminologies used with databases may	• Table • Records

Variable	Range
include but not limited to:	• Field • DBMS
2. Properties of MS SQL server database may include but not limited to:	• Deleting a database • Deleting data or log files • Increasing database size • Shrinking database • Renaming database • Importing a database • Exporting a database
3. Phases of database design may include but not limited to:	• Conceptual design • Logical design • Physical design
4. Data definition queries may include but not limited to:	• CREATE • DROP • ALTER
5. CREATE TABLE statement constraints may include but not limited to:	• Primary key • Foreign key • UNIQUE • CHECK • NOT NULL • DEFAULT
6. Data manipulation query statements may include but not limited to:	• INSERT • SELECT • UPDATE • DELETE
7. Types of joins may include but not limited to:	• Simple Join or Inner Join • Left Join • Right Join • Outer Join
8. Object oriented database concepts may include but not limited to:	• Classes • Objects • Attributes • Inheritance
9. Views may include but not limited to:	• Create a view • Rename a view

Variable	Range
	• Drop a view
10. Triggers may include but not limited to:	• Create a trigger • Alter a trigger • Drop a trigger

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required skills

The individual needs to demonstrate the following skills:

- Communications (verbal and written);
- Time management;
- Problem solving;
- Planning;
- Decision Making;
- Research;

Required knowledge

The individual needs to demonstrate knowledge of:

- Database concepts
- Database design
- Structured Query Language
- Object oriented database design
- Applications of object oriented databases

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Installed MS SQL server 1.2 Explained reasons for using databases 1.3 Explained relational modeling concepts 1.4 Created an entity relationship model 1.5 Normalized database tables 1.6 Validated an ER model

	1.7 Created, edited and dropped tables using SQL 1.8 Retrieved, added, removed and updated records using SQL statements 1.9 Created and queried a database from a validated ER model. 1.10 Retrieved data from several tables using joins 1.11 Explained object oriented database concepts 1.12 Prescribed a database type based on user requirements. 1.13 Demonstrated Object Oriented Concepts 1.14 Demonstrated designing of views and triggers in object oriented databases. 1.15 Implemented Indexing and hashing 1.16 Explained the applications databases.
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
3. Methods of Assessment	Competency may be assessed through: 3.1 Oral questioning 3.2 Practical demonstration 3.3 Observation 3.4 Written test
4. Context of Assessment	Competency may be assessed 4.1 Off the job 4.2 on the job 4.3 During industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.