

DEVELOP DATABASE MANAGEMENT SYSTEMS

UNIT CODE: MATH/OS/AS/CC/04/6/A

UNIT DESCRIPTION

This unit covers the competencies required to carry out management of databases systems. It involves identification of database management systems, designing of database, Creation and manipulation of database, database testing, implementation of the designed database, establishing transaction and concurrency mechanism and managing database security.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Identify database management system	1.1 Database requirements are established based on user needs. 1.2 Main features in databases are identified according to expected output. 1.3 Database components are identified as per the database and user needs. 1.4 Classification and categories of databases is done 1.5 Functionality of databases is identified as per the requirements 1.6 Suitable database system is adopted as per user requirements
2. Design database system	2.1 Appropriate database structures are determined 2.2 Database design is implemented based on requirements. 2.3 Database modelling is done as per the design implemented 2.4 Database operations are performed
3. Create and manipulate database system	3.1 Appropriate data Attributes are applied appropriately

	<p>3.2 Data relationships are established as per the tables created</p> <p>3.3 Model and index of the data is done.</p> <p>3.4 Data is extracted from database using SQL</p>
4. Perform database testing	<p>4.1 Test data is prepared according to the database design</p> <p>4.2 Run the test data based on the expected output</p> <p>4.3 Check the test results based on the clients' needs</p> <p>4.4 Validate the results based on the client's needs</p> <p>4.5 Report the findings as per the results.</p>
5. Implement designed database	<p>5.1 Scope is defined as per the design</p> <p>5.2 Organize database project according to time frame</p> <p>5.3 Select database management system products</p> <p>5.4 Develop initial implementation plan and schedule</p> <p>5.5 Design the database</p> <p>5.6 Install and test database</p> <p>5.7 Develop detailed conversion plan</p> <p>5.8 Convert existing applications</p> <p>5.9 Fine tune the database</p> <p>5.10 Perform training</p> <p>5.11 Periodically review database performance</p>
6. Establish transaction and concurrency mechanism	<p>6.1 Transaction mechanisms used in database management system are identified</p> <p>6.2 Management of multiple transactions in database management system are identified</p>
7. Manage database security	<p>7.1 Restriction of access to the database is established</p> <p>7.2 Backup and recovery methods are identified and implemented.</p>

RANGE

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

Variable	Range
1. Database components may include but is not limited to:	<ul style="list-style-type: none">• Software• Hardware• Data• Procedures• Database Access Language• Query Processor• Run Time Database Manager• Data Manager• Database Engine• Data Dictionary• Report Writer
2. Database structures may include but is not limited to:	<ul style="list-style-type: none">• Record Types.• Fields.
3. Database operations may include but is not limited to:	<ul style="list-style-type: none">• INSERT• SELECT• UPDATE• DELETE
4. data Attributes may include but is not limited to:	<ul style="list-style-type: none">• Atomic Attribute• Composite Attribute• Single Valued Attribute• Multi Valued Attribute• Stored Attribute• Derived Attribute• Null Valued Attribute

REQUIRED KNOWLEDGE AND SKILLS

KNOWLEDGE

The individual needs to demonstrate knowledge and understanding of:

- Database management system types
- Database manipulation and creation
- Types of database testing
- Database testing techniques
- Database structures and operations
- Data Models, Attributes and relationships
- Transactions and concurrency mechanisms
- Database design and implementation methods
- Database security features

SKILLS

- Communications (verbal and written);
- Proficient in ICT;
- Time management;
- Analytical
- Problem solving;
- Planning;
- Decision making;
- Report writing;

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none">1.1 Established Database requirements1.2 Identified database components1.3 Adopted a Suitable database system1.4 Performed Database operations
-----------------------------------	---

	<ul style="list-style-type: none"> 1.5 Applied Appropriate Data Attributes 1.6 Extracted data from database using SQL 1.7 Performed test data and validated the results 1.8 Identified transaction and concurrency mechanisms 1.9 Established restrictions to the database
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Computer 2.2 Servers 2.3 Database Software
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Oral questioning 3.2 Practical Tests 3.3 Written Tests
4. Context of Assessment	<p>Competency may be assessed individually in the actual workplace or through a simulated work place environment or During Industrial Attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>