



Course Specification

DIPLOMA

Course Title: **Database Management Systems**

Course Code: **APDA2207**

Program: **Diploma in Data Analytics**

Department: **Diploma Department**

College: **The Applied college**

Institution: **Umm Al-Qura University**

Version: **2**

Last Revision Date: **17 June 2025**



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content.....	5
D. Students Assessment Activities	6
E. Learning Resources and Facilities.....	6
F. Assessment of Course Quality	7
G. Specification Approval	7



A. General information about the course:

1. Course Identification

1. Credit hours: (3 hours)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2nd / 1st year)

4. Course General Description:

This course introduces students to the concepts and techniques of database systems. Topics include database design, schema creation, SQL data operations, and managing relational database.

5. Pre-requirements for this course (if any):

APDA1201 Discrete Structures

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

To provide students with foundational knowledge and practical skills in database systems, including schema design, SQL query development, and performance optimization, focusing on applying these concepts in real-world data science workflows.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the differences between a relational database and flat files.	K1	Lectures, interactive discussions, guided readings	Exams, quizzes, participations
1.2	Explain the role of ER and UML diagrams in designing relational databases.	K1	Lectures, lab exercises, project-based learning	Lab projects, quizzes, exams, participations
1.3	Describe the principles of normalization and their impact on improving database design.	K1	Lectures, hands-on lab activities, case studies	Assignments, exams, participations
2.0	Skills			
2.1	Design relational database using modern tools and techniques	S2	Guided exercises, discussions on best practices, scenario-based problem solving	Projects, lab assessments, exams
2.2	Create and query database using SQL commands.	S3	Lab-based instruction, real-world SQL problems, individual assignments	Projects, lab assessments, coding test, exams
2.3	Optimize database performance through indexing and query optimization.	S4	Guided exercises, discussions on best practices, scenario-based problem solving	project evaluations, lab assessments, exams
3.0	Values, autonomy, and responsibility			



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.1	Collaborate effectively in teams to solve database-related challenges.	V3	Group projects, peer review, collaborative lab exercises	Group project evaluations, peer feedback
3.2	Demonstrate responsibility in ensuring data integrity and security.	V2	Case studies, ethical discussions, role-play scenarios	Case study analysis, reflective essays

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Database	4
2.	Database Systems Concepts and Architecture	4
3.	Database Design and Entity-Relationship (ER) Modeling	4
4.	Relational Database Model: Schema and Integrity	4
5.	The Relational Algebra	4
6.	Functional Dependencies and Normalization	4
7.	SQL Basics: Queries, Data Definition, and Manipulation	4
8.	Advanced SQL: Joins, Subqueries, and Views	4
9.	SQL: Integrity Constraints	4
10.	Indexing and Query Optimization	4
11.	Transactions, Concurrency Control, and Recovery	4
12.	Database Security and Backup Strategies	4
13.	NoSQL Database Overview	4
14.	Emerging Trends: Cloud Database and Big Data Integration	4
15.	Project Presentation and Discussion	4
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Lab Exercises	1-14	20%
2.	Midterm Exam	8	20%
3.	Group Project	15	20%
4.	Final exam	16-17	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).



E. Learning Resources and Facilities

1. References and Learning Resources

Required Textbooks	Database System Concepts by Silberschatz, Korth, and Sudarshan (7th Edition, 2021)
Essential References	<ul style="list-style-type: none"> - Fundamentals of Database Systems by Elmasri and Navathe (7th Edition, 2021) - Modern Database Management by Jeffrey A. Hoffer and Ramesh Venkataraman (12th edition, 2018) - SQL QuickStart Guide by Walter Shields (2nd Edition, 2021)
Supportive References	Online courses on database systems (Coursera)
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom & Laboratory
Technology equipment (projector, smart board, software)	Overhead projector along with relevant database management systems and IDEs.
Other equipment (depending on the nature of the specialty)	Access to cloud database platforms

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect Course survey and students' feedback.
Effectiveness of Students	Faculty Members, Peer Reviewers	Direct Report on the satisfaction of exam standards.
Quality of learning resources	Faculty Member, Course Coordinators	Direct Learning resources evaluation survey.
The extent to which CLOs have been achieved	Faculty Members, Program Leaders	Direct Course reports.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)





G. Specification Approval

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851281214463/193664
DATE	1447/01/20

