BHAGWAN MAHAVIR UNIVERSITY

Effective From (2025-2026)

MASTER OF COMPUTER APPLICATION

Semester: I

Subject Code	Subject Title	Teaching Scheme					
		(Hours/Week)		Credits	Examination Marks		Total Marks
		Theory	Tutorial		Internal	External	
3050302102	**Relational Database Management System**	3	0	3	40	60	100

Duration of Exam: 2:30 Hours

Objective of the course:

- To introduce students to database concepts, models, query languages, normalization, and transaction management for designing efficient database applications.

Course Outcomes:

Upon completion of the course, the student shall be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand the core concepts and architecture of database systems.	25
CO-2	Apply relational algebra and SQL for managing and querying relational data.	25
CO-3	Develop PL/SQL programs using procedures, functions, and triggers.	15
CO-4	Design ER diagrams and normalize databases to remove redundancy.	20
CO-5	Understand transaction management, concurrency control and recovery mechanisms.	15

Detail Content:

Sr. No.	Topic	Total Hrs.
1	**Introduction to Database Systems** ● Definition and evolution of databases ● Applications of database systems ● Comparison: File Systems vs. DBMS ● Characteristics of DBMS ● DBMS Architecture ● Database Languages ● Database Users	12
2	**Relational Model and Structured Query Language** ● Relational Model Concepts ● Advantages of RDBMS ● Relational Algebra ● Introduction to SQL ● SQL Data Manipulation ● Advanced SELECT Queries ● Joins and Subqueries	12
3	**PL/SQL, and Programming Constructs** ● PL/SQL Introduction ● Control Structures in PL/SQL ● Exception Handling ● Cursors ● Stored Procedures and Functions ● Database Triggers	07
4	**Database Design and Normalization** ● Entity-Relationship (ER) Model ● Functional Dependencies ● Normalization Techniques ● Denormalization	10
5	**Transactions, Concurrency Control** ● Transactions in DBMS ● Deadlock Management ● Database Recovery Techniques ● Introduction to Modern Databases	07

CO-PO Mapping Matrix with Bloom's Levels

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	-	-	-	-	-	1	-	1
CO2	3	2	2	-	-	-	-	-	-	-	-	2
CO3	3	3	3	1	1	-	-	-	-	-	-	2
CO4	3	3	2	1	-	-	-	-	-	-	-	2
CO5	3	3	2	2	1	-	-	-	-	-	-	2

Scale: 3 = Strong, 2 = Moderate, 1 = Slight, - = No relation

Text books:

1. **Database System Concepts** – Abraham Silberschatz, Henry F. Korth, S. Sudarshan – McGraw Hill – Latest Edition
2. **SQL, PL/SQL: The Programming Language of Oracle** – Ivan Bayross – BPB Publications – Latest Edition
3. **Database Management Systems** – Raghu Ramakrishnan, Johannes Gehrke – McGraw Hill – Third Edition
4. **Oracle Database 12c SQL** – Jason Price – McGraw Hill Education – Latest Edition

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