## MC212 Database Management System DBMS (3-0-2-4)

**Autumn Semester 2025-26**
**(MnC Semester III Core Course)**

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**Extn. 548**

### Course Outline

This course teaches use of Relational Database Management System (RDBMS) to understand and solve a wide range of information storage and query processing problems in organizations ranging from large corporations to personal applications. The course combines the practical aspects of DBMS use with basic theory discussions about database design. Students will be learning basic storage and query processing concepts of Parallel and Distributed Databases. As part of the lab assignments/ a project, students will learn to build and query the database using DBMS tool for the given problem domain (case study).

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### Text Books

Silberschatz, Korth & Sudarshan, ***Database System Concepts***, Seventh Edition, 2019,McGraw-Hill

### Course Outcomes:

The students will learn to store the data and process queries using RDBMS data model. Database will be designed and implemented using relational technology.

| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | X | X | | X | | X | X | X | | X |

**Lecture Plan**

| Lectures | Topic |
|---|---|
| **2** | Course Overview: Basic Definitions, Data Storage, Queries, Transaction Management |
| **4** | Relational Model: Introduction, Integrity Constraints, Logical Database Design |
| **4** | Query Language: SQL |
| **4** | Requirements Collection and Analysis<br>Data Models: E-R Model, Conceptual Design |
| **5** | Database Design & Tuning: Functional Dependency, Normal Forms, Decomposition, Normalization, Schema Refinement |
| **4** | Data Storage: Physical Storage, Hierarchy, Data Storage Structures<br>Indexing Techniques |
| **4** | Query Processing and Optimization: Query Cost, Evaluation Plans, Materialized Views |
| **4** | Transaction Management: ACID properties, Transactions as SQL Statements<br>Concurrency Control: Lock based, Time stamp based, Validation based, Deadlock detection and handling, Multiversion, Multigranularity |
| **4** | Distributed and Parallel Databases: Data Storage and Query Processing |
| **4** | Modern Databases: NoSQL Databases, Columnar Storage |

**Evaluation Scheme**

- Labs and Assignments 30%
- InSem Exam(s) 30%
- End Semester Exam 40%

**Course Policy**

- *Attendance Policy of the institute is applicable.*
- *Student will be evaluated during each lab.*
- *Each Lab submission will be evaluated. Student has to complete all the lab assignments and evaluations in order to pass the course.*