



INFORMATION TECHNOLOGY
ENGINEERING

IT ENGINEERING SEM III

DATABASE MANAGEMENT

SYSTEM

Programming & development

Course Curriculum



DATABASE MANAGEMENT SYSTEM SEM III

Module 1 : Database System Concepts and Architecture

- Introduction
- Characteristics of Databases
- File system v/s Database system
- Data abstraction and Data Independence
- DBMS system architecture
- Database Administrator (DBA)
- Role of DBA
- Identify the types of Databases

Module 2: The Entity-Relationship Model

- Conceptual Modelling of a database
- The Entity-Relationship (ER) Model
- Entity Type
- Entity Sets
- Attributes and Keys
- Relationship Types
- Relationship Sets
- Weak entity Types Generalization
- Specialization and Aggregation
- Extended Entity-Relationship (EER) Model

Module 3: Relational Model & Relational Algebra

- Introduction to Relational Model
- Relational Model Constraints and Relational Database Schemas
- Concept of Keys
 - Primary Key
 - Secondary key
 - Foreign Key
- Mapping the ER and EER Model to the Relational Model
- Introduction to Relational Algebra



- Relational Algebra expressions for Unary Relational Operations
 - Set Theory operations
 - Binary Relational operation
- Relational Algebra Queries

Module 4: Structured Query Language (SQL) & Indexing

- Overview of SQL
- Data Definition Commands
- Set operations
- aggregate function
- null values
- Data Manipulation commands
- Data Control commands
- Complex Retrieval Queries using Group By
- Recursive Queries
- nested Queries
- Integrity constraints in SQL
- Database Programming with JDBC
- Security and authorization
- Grant & Revoke in SQL Functions and Procedures in SQL and cursors
- Indexing
 - Basic Concepts
 - Ordered Indices
 - Index Definition in SQL

Module 5: Relational Database Design

- Design guidelines for relational Schema
- Functional Dependencies
- Database tables and normalization
- The need for normalization
- The normalization process
- Improving the design
- Definition of Normal Forms
 - 1NF, 2NF, 3NF
 - The Boyce-Codd Normal Form (BCNF)



Module 6: Transactions Management and Concurrency and Recovery

- Transaction
 - Transaction concept
 - State Diagram
 - ACID Properties
 - Transaction Control Commands
 - Concurrent Executions
 - Serializability
 - Conflict and View
- Concurrency Control
 - Lock-based-protocols
 - Deadlock handling Timestamp-based protocols
- Recovery System
 - Recovery Concepts
 - Log based recovery

