MSCS104   DATABASE MANAGEMENT SYSTEMS (3-0-0)

Module-1 (10 Hours)
Introduction and overview of DBMS. Comparison of Database Systems with file systems. Database users and Administrators, DB Languages, 3-schema Architecture and Data Independence.
Conceptual Modelling: ER Model - Entity types, Key, Relationship types and constraints, Weak Entity types and its relationship, ER Diagram, Extended ER Features.

Module-2 (10 Hours)
EF Codd rules. Relational Model, its structure, keys, Integrity constraints, Conversion of ER Model to Relational Model, Relational Algebra, Tuple Relational Calculus.
Relational Database Design: Functional Dependencies, closure, cover, equivalent set of FDs, Minimal cover.
Module 3 (10 Hours)
Relational Database Design (Contd.)- Normalization- Aim, 1NF,2NF,3NF, BCNF, Decomposition using FDs, Lossless and Dependency Preserving Scheme of Decomposition, MVD and 4NF, JD and 5NF.
Query Optimization: Various Optimization Algorithms, Transforming Relational Algebra into Query trees. Heuristic Optimization Rules.

Module 4 (10 Hours)
SQL - DDL, DML, DCL, Constraints, keys, set operations, Aggregate Functions, Group by, Join and its Types, Sub Query, Views, PL/SQL-Cursor, Trigger.
Transaction Concepts: Properties, Problems with concurrent Transactions, Concurrency Control, Serializability, Testing for serializability, Cascade less and Recoverable schedules, 2 Phase Locking Protocol and its Variations, Deadlocks, Recovery Management

Advanced Database (Outline) : OODB, WEB DB, Data Warehousing and Data Mining

Text Books:
1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, "Database Systems Concepts", McGraw-Hill Education , New Delhi
2. RamezElmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", Pearson Education Inc., New Delhi.

Reference Books:
1. Hector Garcia-Molina, Jeffret D. Ullman, Jenniffer Widom, "Database Systems: A Complete Book", Pearson Education Inc., New Delhi.
2. C. J. Date "An introduction to Database System", Pearson Education Inc., New Delhi.
3. Bipin Desai, "An introduction to Database System", Galgotia Publications.
4. Peter Rob & Carlos Coronel, "Database Systems: Design, Implementation, and Management", CENGAGE Learning India Pvt. Ltd., New Delhi.
5. Mark L. Gillenson, "Fundamentals of Database Management Systems", Wiley India Pvt. Ltd., New delhi.
6. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw-Hill Education (India), New Delhi.