

# **DATABASE MANAGEMENT SYSTEMS**

## **IV SEM**

**Course Code: 16CS302**

### **Module 1**

Introduction: Purpose of Database System--Views of data-data models, database management system, three-schema architecture of DBMS, components of DBMS. E/R Model - Conceptual data modelling - motivation, entities, entity types, attributes, relationships, relationship types, E/R diagram notation, examples.

### **Module 2**

Relational Model: Relational Data Model - Concept of relations, schema-instance distinction, keys, referential integrity and foreign keys, relational algebra operators, SQL -Introduction, data definition in SQL, table, key and foreign key definitions, update behaviours. Querying in SQL, notion of aggregation, aggregation functions group by and having clauses.

### **Module 3**

Database Design: Dependencies and Normal forms, dependency theory - functional dependencies, Armstrong's axioms for FD's, closure of a set of FD's, minimal covers, definitions of 1NF, 2NF, 3NF and BCNF, decompositions and desirable properties of them, algorithms for 3NF and BCNF normalisation, 4NF, and 5NF.

### **Module 4**

Transactions: Transaction processing and Error recovery - concepts of transaction processing, ACID properties, concurrency control, locking based protocols for CC, error recovery and logging, undo, redo, undo-redo logging and recovery methods.

### **Module 5**

Embedded SQL: triggers, procedures and database connectivity. Introduction to NoSQL.