



**Paper Code : DMS:401**  
**Paper Name : Database Management System**

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal Th. (marks)	External Th. (marks)	Total
4		30	70	100 (marks)

**Lectures = 68 Hours**

### Objective:

Introduce the student to the fundamental concepts necessary for designing, using and implementing database systems and applications.

### Detailed Syllabus

#### UNIT I

**15 Hours**

##### Introduction

An overview of database management system, Database System Vs File System, Database system concepts and architecture, data models, schema and instances, data independence and database language and interfaces, Data definitions language, DML, Overall Database Structure, role of a DBA,

**Data Modeling using the Entity Relationship Model:** ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, Specialization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

#### UNIT II

**15 Hours**

**Relational data**

##### Model and Language

Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints.

**Relational Algebra:** Relational algebra, relational calculus, tuple and domain calculus.

**Introduction to SQL:** Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors in SQL.

**UNIT III****15 Hours****Data Base Design & Normalization**

Functional dependencies, normal forms, first, second, third normal forms, BCNF, and Higher Normal forms, inclusion dependencies, lossless join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

**UNIT IV****8 Hours****Transaction Processing Concepts**

Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

**UNIT V****15 Hours****Concurrency Control Techniques**

Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi-version schemes, Recovery with concurrent transaction. Transaction Processing in Distributed system, data fragmentation. Replication and allocation techniques for distributed system, overview of concurrency control and recovery in distrusted database.

**Text Book:**

1. Abraham Silberschatz, Henry F.Korth, S.Sudharshan, " Database System Concepts ", III Edition, Tata McGraw, 1997.

**References**

1. C.J Date, S. Swamynathan, "An Introduction to Database System", Pearson Edition
2. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley
3. Desai, "An introduction to Database Systems", Asian Students Edition
4. Hansen & Hansen, "Database Management and Design", Eastern Economy Edition
5. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill
6. Gilfillan, "Mastering MySQL", BPB Publication
7. Kroenke, " Database Processing", Prentice-Hall India