Course Name:	Data Base Management System
Course Code:	CS(EE)701D
Course Credit:	2
Contact Hour:	3L-1T
Prerequisite:	Computer Organization, Operating System, Data Structure, Mathematics

Course Objective:

The objectives of this course are

1. Understand values of Data.

2. Understand significant role of DBMS.

3. Understand need for normalizing a Database.

4. Understand problems with unnecessary duplication of data.

5. Understand concepts of transaction

6. Understand concepts of concurrent transactions

Course Outcome:

On completion of the course students will be able to

1. Acquire knowledge of handling large volume of data.

2. Acquire skills to deal with Real life database implementation.

3. Response off faster queries and serve as many users as possible concurrently.

4. Fit with any Database project in industry after completion of degree.

CO Mapping with departmental POs

H: High, M: Medium, L: Low

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	H	L	H	L	H	L	L	L	M	L	H	L
CO 2	H	L	H	L	H	L	L	L	M	L	H	L
CO 3	H	L	H	L	H	L	L	L	M	L	H	L
CO 4	H	L	H	L	H	L	L	L	M	L	H	L

Course Content

Module I: Introduction 2L

Why Database: Relation among DB, DBMS and DBS,Characteristics of Data in Database, Advantage of DBMS over FPS. Database models, Database Users, Role of DBA, Three Schema architecture of DBMS.

Module II: Entity Relationship Model 3L

Components of ER Model, ER Modeling Symbols, Attribute inheritance, Extended E-R features: Super Class and Sub class types.

Module III: Relational DBMS 8L

Introduction to Relational DBMS, RDBMS Terminology. Keys, Relationships, First Normal Form, Functional dependencies, Second Normal form, Third Normal Form, Boyce-Codd Normal form, Fourth Normal Form, Fifth Normal form, Case study.

Module IV: Relational Algebra and Relational Calculus 4L

Structure of relational Databases, Relational Algebra, Relational Calculus, Extended Relational Algebra Operations, Views, Modifications Of the Database.

Module V: Introduction to SQL   8L

History of SQL, Characteristics of SQL, Advantages of SQL, SQL in Action SQL data types and Literals, Types of SQL commands, SQL Operators and their precedence, Tables, Views and indexes, Queries and Sub Queries, Aggregate functions, Insert, Update and Delete operations, Joins, Unions, Intersection, Minus, Cursors in SQL, Embedded SQL.

Module VI: Internals of RDBMS   6L

Physical data structures, Query optimization : join algorithm, statistics and cost based optimization. Transaction processing, Concurrency control and Recovery Management : transaction model properties, Serializability, lock base protocols, two phase locking, Timestamp protocol.

Module VII: File Organization & Index Structures   6L

File & Record Concept, Placing file records on Disk, Fixed and Variable sized Records, Types of Single-Level Index (primary, secondary, clustering), Multilevel Indexes, Dynamic Multilevel Indexes using B tree and B+ tree and hash tree .

Module VIII: Backup and Recovery   4L

Database backups, Why plan backups?, Hardware protection and redundancy, Transaction logs, Database recovery, Data storage, Causes and classification of failures, Recovery concepts and terminology, Recovery facilities, Recovery techniques, Disaster Database Management System.

Module IX: Database Security and Integrity   4L

Types of Integrity constraints, Restrictions on integrity constraints, Data security Risks, Complex user management requirements, Dimensions of security, Data security requirements, Protecting data within the database, Granting and revoking privileges and roles, System viability Factors, Authenticating users to the database.

Text Books:

1. Henry F. Korth and Silberschatz Abraham, "Database System Concepts", Mc.Graw Hill.
2. Elmasri Ramez and Novathe Shamkant, "Fundamentals of Database Systems", Benjamin Cummings
1. Publishing. Company.
2. Ramakrishnan: Database Management System , McGraw-Hill
3. Gray Jim and Reuter Address, "Transaction Processing : Concepts and Techniques", Moragan Kauffman Publishers.
4. Jain: Advanced Database Management System CyberTech
5. Date C. J., "Introduction to Database Management", Vol. I, II, III, Addison Wesley.
6. Ullman JD., "Principles of Database Systems", Galgottia Publication.

Reference Books:

1. James Martin, "Principles of Database Management Systems", 1985, Prentice Hall of India, New Delhi
2. "Fundamentals of Database Systems", Ramez Elmasri, Shamkant B.Navathe, Addison Wesley
1. Publishing Edition
2. "Database Management Systems", Arun K.Majumdar, Pritimay Bhattacharya, Tata McGraw Hill