

IV B.Tech – I Semester
(17CS742) DATABASE MANAGEMENT SYSTEMS (from CSE) (Open Elective-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	1	-	3

Pre-Requisites: Discrete Structures, Data structures

Course Objectives:

- To learn the principles of systematically designing and using large scale Database Management Systems for various applications.

UNIT-I: An Overview of Database Management, Introduction- What is Database System What is Database-Why Database- Data Independence- Relation Systems and Others- Summary, Database system architecture, Introduction- The Three Levels of Architecture-The External Level- the Conceptual Level-the Internal Level- Mapping- the Database Administrator-The Database Management Systems- Client/Server Architecture.

UNIT-II: The E/R Models, The Relational Model, Relational Calculus, Introduction to Database Design, Database Design and Er Diagrams-Entities Attributes, and Entity Sets-Relationship and Relationship Sets-Conceptual Design With the Er Models, The Relational Model Integrity Constraints Over Relations-Key Constraints –Foreign Key Constraints-General Constraints, Relational Algebra and Calculus, Relational Algebra- Selection and Projection- Set Operation, Renaming – Joins- Division- More Examples of Queries, Relational Calculus, Tuple Relational Calculus- Domain Relational Calculus.

UNIT-III: Queries, Constraints, Triggers: The Form of Basic SQL Query, Union, Intersect, and Except, Nested Queries, Aggregate Operators, Null Values, Complex Integrity Constraints in SQL, Triggers and Active Database.

UNIT-IV: Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), concept of surrogate key, Boyce-codd normal form(BCNF), Lossless join and dependency preserving decomposition, Fourth normal form(4NF).

UNIT-V: Transaction Management and Concurrency Control: Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and save point. Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods: lock granularity, lock types, two phase locking for ensuring serializability, deadlocks, Concurrency control with time stamp ordering : Wait/Die and Wound/Wait Schemes, Database Recovery management : Transaction recovery.

UNIT-VI: Overview of Storages and Indexing, Data on External Storage- File Organization and Indexing – Clustered Indexing – Primary and Secondary Indexes, Index Data Structures, Hash-Based Indexing – Tree-Based Indexing, Comparison of File Organization

Course Outcomes:

CO-1	Understand architecture of database systems.	L2
CO-2	Apply Relational Model to design and manipulate a Database.	L3
CO-3	Apply Queries, Constraints, Triggers on databases.	L3
CO-4	Design a Database using Normalization techniques.	L3
CO-5	Determine Database transactions as per concurrency and ACID properties.	L2
CO-6	Evaluate methods for storing and indexing Database Files.	L5

Correlation of COs with POs & PSOs:

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	3	2	2	-	-	-	-	-	-	-	1	1	-
CO-2	2	3	3	2	2	-	-	-	-	-	-	-	1	1	-
CO-3	2	2	3	2	2	-	-	-	-	-	-	-	1	1	-
CO-4	2	3	3	2	2	-	-	-	-	-	-	-	1	1	-
CO-5	2	2	3	2	2	-	-	-	-	-	-	-	1	1	-
CO-6	2	2	2	2	2	-	-	-	-	-	-	-	1	1	-

Text Books:

1. Introduction to Database Systems, CJ Date, Pearson
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw Hill 3rd Edition
3. Database Systems - The Complete Book, H G Molina, J D Ullman, J Widom Pearson

References Books:

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education