

DATA BASE MANAGEMENT SYSTEMS	
CSE 312	Credits : 4
Instruction : 4 Periods & 1 Tut/Week	Sessional Marks : 40
End Exam : 3 Periods	End Exam Marks : 60

Prerequisites:

Elementary knowledge about computers including some experience using UNIX or Windows. Knowledge about data structures and algorithms, corresponding to the basic course on Data Structures and Algorithms.

Course Objectives:

- Understand basic database concepts, including the structure and operation of the relational data model.
- Understand logical database design principles, including E-R diagrams and database normalization.
- To learn the basics of SQL and construct queries using SQL.
- Understand the concept of database transaction and concurrency control, backup and recovery, data object locking and protocols.

Course Outcomes:

By the end of the course, the student will be able to:

1.	Describe basic concepts of database systems and principles of transaction processing, concurrency techniques and recovery of database.
2.	Apply Conceptual and logical database design principles, including E-R diagrams.
3.	Compose SQL queries to perform operations on database. (Create, Retrieve, Update, Delete)
4.	Construct relational algebra expressions for queries
5.	Analyze and apply schema Refinement ,database normalization principles.

Mapping of Course Outcomes with Program Outcomes:

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

1-low,2-Medium 3-strong

SYLLABUS

UNIT-I:

12 Periods

Introduction to DBMS:

Overview of DBMS, File system versus a DBMS , Advantages of a DBMS, Three Schema architecture of DBMS, Data Models, Database Languages, Transaction Management , Structure of a DBMS ,Client/Server Architecture ,Database Administrator and Users.

Entity-Relationship Model:

Design Issues, ER Modeling concepts , Cardinality constraints, Weak-entity types, Subclasses and inheritance, Specialization and Generalization, Conceptual Database Design With the ER Model.

UNIT-II:**10 Periods****Relational Model:**

Structure of Relational Databases, Basics of Relational Model ,Integrity Constraints, Logical Database Design, Introduction to Views, Destroying/ Altering Tables and Views, Relational Algebra, Relational Calculus.

UNIT-III:**12 Periods****SQL:**

Concept of DDL, DML, DCL, Set operations, Nested queries ,Aggregate Functions, Null Values, Referential Integrity Constraints, assertions, views, EmbeddedSQL ,Cursors Stored procedures and triggers,ODBC andJDBC, Triggers andActive Database, designing active databases.

UNIT-IV:**12 Periods****Database Design:**

Schema Refinement,Functional Dependencies,Reasoningabout Functional Dependencies, Normalization using functional dependencies, Decomposition, Boyce-Codd Normal Form, 3NF, Normalization using multi-valued dependencies, 4NF, 5NF

Security:

Access Control,DiscretionaryAccess Control - Grant and Revoke on Views and Integrity Constraints, Mandatory Access Control.

UNIT-V:**15 Periods****Transaction Management:**

The ACID Properties,Transactions & Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control.

Concurrency Control:

2PL,Serializability and Recoverability, Introduction to Lock Management, Lock Conversions, Dealing with Deadlocks, Specialized Locking Techniques, Concurrency Control without Locking.

Crash Recovery:

Introduction to ARIES, The Log, Other Recovery-Related Structures, The Write-Ahead Log Protocol, Check pointing, Recovering from a System Crash, Media Recovery.

Text Books:

1. Raghu Ramakrishnan, Johannes Gehrke "Database Management Systems", 3rd Edition, McGraw- Hill

References Books:

1. A.Silberschatz.H.Korth, "Database System Concepts" , 5th Edition, McGraw-Hill

Web Resources:

1. <https://www.youtube.com/playlist?list=PLyvBGMFYV3auVdxQ1-88ivNFpmUEy-U3M>
2. <http://nptel.ac.in/courses/IIT-MADRAS/Intro to Database Systems Design/pdf/1 Introduction.pdf>
3. <https://www.youtube.com/watch?v=1057YmExS-I>