CS-404B	DATABASE MANAGEMENT SYSTEMS (OPEN ELECTIVE)	L	T	P	C
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COURSE OBJECTIVES:

1. To understand the fundamental concepts, historical perspectives, current trends, structures, operations and functions of different components of Databases.
2. To understand the types of integrity constraints in a relational database system and the concepts of SQL to create and access the database.
3. To understand basic concepts of ER model and database design using normalization process.
4. To understand concurrency, Recovery techniques.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. understand basic concepts and use of various database systems.
2. enforce integrity constraints to maintain validity & accuracy.
3. write relational expressions for the queries.
4. design and develop a database using normalization theory.
5. use different concurrency control and Recovery techniques.

UNIT I **(12)**

Databases and Database Users : Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach.

Database System Concepts and Architecture : Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs

UNIT II **(12)**

Data Modeling Using the Entity-Relationship (ER) Model : Using High- Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types.

The Relational Data Model and Relational Database Constraints : Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations.

UNIT III **(12)**

SQL-99 : Schema Definition, Constraints, Queries, and Views : SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL â€“ More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL.

UNIT IV **(12)**

Functional Dependencies and Normalization for Relational Databases : Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form.

Introduction to Transaction Processing Concepts and Theory :

Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability -Characterizing Schedules Based on serializability.

UNIT V **(12)**

Concurrency Control Techniques : Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering.

Database Recovery Techniques : Recovery Concepts - Recovery Techniques Based on Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging.

LEARNING RESOURCES:

TEXT BOOK(s):

Fundamentals of Database Systems, Ramez Elmasri and SHamKanth B.Navate Pearson Education, 5th edition.

REFERENCE BOOK(s):

1. Introduction to Database Systems, C.J.Date Pearson Education.
2. Data Base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rdEdition.
3. Data base System Concepts, Abraham Silberschatz, Henry.F.Korth, McGraw hill, 5th edition.