III/IV B.TECH. SECOND SEMESTER

DATABASE MANAGEMENT SYSTEMS (FREE ELECTIVE)

Course Code : CS6T5FE1   **Credits: 3**
Lecture: 3 periods/ week   **Internal assessment: 30 Marks**
Tutorial: 1period/week   **Semester end examination: 70 Marks**

Course Objectives:

1. The main objective of this course is to enable students to the fundamental concepts of database analysis and design.
2. To recognize the importance of database analysis and design in the implementation of any Database application and to understand the process of drawing the ER-Diagrams.
3.It also gives the knowledge of the roles of transaction processing and concurrency control.

Course Outcomes:

CO1) Understand the basic principles of database management systems.
CO2) Draw Entity-Relationship diagrams to represent simple database application scenarios
CO3) write SQL queries for a given context in relational database.
CO4)Discuss normalization techniques with simple examples.
CO5)Describe transaction processing and concurrency control concepts.

Syllabus:

UNIT 1

Introduction to Databases: Characteristics of the Database Approach, Advantages of using the DBMS Approach, A Brief History of Database Applications.
Overview of Database Languages and Architectures: Data Models, Schemas and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, Database System environment, Centralized and Client-Server Architecture for DBMS.

UNIT 2

Relational Model: The Relational Model Concepts , Relational Model Constraints and Relational Database Schemas.
SQL: Data Definition, Constraints, and Basic Queries and Updates,Views(Virtual Tables) in SQL.

UNIT 3

Conceptual Data Modeling : High-Level Conceptual Data Models for Database Design, A Sample Database Application, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types.
ER-Diagrams: Refining the ER Design, ER Diagrams, Naming Conventions and Design Issues, Relationship Types of Degree Higher Than Two.

UNIT 4

Database Design Theory: Functional Dependencies, Normal forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form.

UNIT 5

Transaction Processing: Introduction, Transaction and System Concepts, Desirable Properties of Transactions.
Introduction to Protocols for Concurrency Control in Databases : Two-Phase Locking Techniques for Concurrency Control-Types of Locks and System Lock Tables.

Learning Resource

Text Books

1. DATABASE SYSTEMS Models, Languages, Design and Application
Programming, 6th Edition, Ramez Elmasri ,Shamkant B.Navathe , Pearson.