PVP SIDDHARTHA INSTITUTE OF TEHNOLOGY, KANURU, VIJAYAWADA

(AUTONOMOUS)
INFORMATION TECHNOLOGY
DATABASE MANAGEMENT SYSTEMS

Course Code	20IT3401	Year	II	Semester	II
Course Category	PC	Branch	IT	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Data Structures
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes	
Upon Successful completion of course, the student will be able to	
CO1	Understand the basic concepts of database management systems — L2
CO2	Apply SQL as well as Relational Algebra to find solutions to a broad range of queries — L3
CO3	Apply various data models for database design — L3
CO4	Apply normalization techniques to improve database design — L3
CO5	Analyze a given database application scenario to use ER model for conceptual design of the database and make an effective report (Assignment) — L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1													3	
CO2	3											3	3	
CO3	3										3	3	3	
CO4	3										3		3	
CO5		3							3	3	3		3	

Syllabus

Unit No	Contents	Mapped CO
I	**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 DBMSs.	CO1

II	**Relational Model:** The Relational Model Concepts, Relational Model Constraints and Relational Database Schemas. **SQL:** Data Definition, Constraints, and Basic Queries and Updates, SQL Advanced Queries, Assertions, Triggers, and Views **Formal Relational Languages:** Relational Algebra: Unary Relational Operations: Select and Project, Relational Algebra Operations from Set Theory, Binary Relational Operations: Join and Division, Examples of Queries in Relational Algebra.	**CO1, CO2, CO5**
III	**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, Refining the ER Design, ER Diagrams, Naming Conventions and Design Issues, Relationship Types of Degree Higher Than Two Relational Database Design Using ER-to-Relational Mapping.	**CO1, CO3, CO5**
IV	**Database Design Theory:** Functional Dependencies, Normal forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form, Multi valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.	**CO1, CO4, CO5**
V	**Transaction Processing:** Introduction, Transaction and System Concepts, Desirable Properties of Transactions, Characterizing Schedules Based on Recoverability &Serializability, Transaction Support in SQL. **Introduction to Concurrency Control:** Two-Phase Locking Techniques: Types of Locks and System Lock Tables, Guaranteeing Serializability by Two-Phase Locking. Introduction to Recovery Protocols – Recovery Concepts, No-UNDO/REDO Recovery based on Deferred Update, Recovery Techniques based on Immediate Update, Shadow Paging.	**CO1**

Learning Recourses
Text Books
1. *DATABASE SYSTEMS Models, Languages, Design and Application Programming*, Sixth Edition, Ramez Elmasri, Shamkant B. Navathe, Pearson.
Reference Books
1.*Data base System Concepts*, Fifth Edition, Abraham Silberschatz, Henry F Korth, S. Sudarshan, McGraw Hill. 2.*Data base Management Systems*, Third Edition, Raghurama Krishnan, Johannes Gehrke, TMH. 3.*Introduction to Database Systems*, Eighth Edition , C.J.Date, Pearson
E-Recourses and other Digital Material
NPTEL VIDEO LECTURES