

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
INFORMATION TECHNOLOGY

PRINCIPLES OF DATABASE MANAGEMENT SYSTEMS

Course Code	23IT2601	Year	III	Semester	II
Course Category	OE	Branch	Offered by IT	Course Type	Theory
Credits	3	L – T – P	3-0-0	Prerequisites	-
Continuous Internal Evaluation	30	Semester End Examination	70	Total Marks:	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Understand the basic concepts of database management systems	L2
CO2	Apply ER model, Relational Algebra and SQL operations to find solutions for a given application	L3
CO3	Apply normalization techniques to improve database design	L3
CO4	Analyze a real time scenario to use Conceptual and Relational data models for designing the database	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2												1	
CO2	3													
CO3	2	1	1											
CO4	1	2	2							1		1		

Syllabus		
Unit No.	CONTENTS	Mapped CO
I	Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system environment, Centralized and Client Server architecture for the databases.	CO1

II	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, CO2, CO4
III	Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra Basic SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update). SQL querying using where clause, arithmetic & logical operations, SQL functions (Date and Time, Numeric, String). Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, views, relational set operations.	CO1, CO2, CO4
IV	Database Design Theory and Normalization: Functional Dependencies, Normal forms based on Primary Keys, General definitions of Second and Third Normal Forms, Boyce-Codd Normal Form, Multi valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Denormalization	CO1, CO3
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 for concurrency control: 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 Resources

Text Books

1. Fundamentals of Database Systems, Ramez Elmasri, Shamkant B. Navathe, Seventh edition, Pearson.

Reference Books

1. Introduction to Database Systems, Eighth Edition, C J Date, Pearson.
2. Data base System Concepts, Abraham Silberschatz, Henry F Korth, S. Sudarshan, Fifth Edition, McGraw Hill.
3. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, 3rd Edition, TMH
4. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

E-Resources & other digital material

1. <https://nptel.ac.in/courses/106/105/106105175/>
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01275806667282022456_shared/overview
3. https://onlinecourses.nptel.ac.in/noc21_cs04/
4. <https://nptel.ac.in/courses/106/106/106106093/>