

Database Management Systems

Course Code	20CS3502	Year	III	Semester	I
Course Category	PCC	Branch	CSE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Engineering Mathematics -1, Data Structures
Continuous Internal Evaluation :	30	Semester End Evaluation:	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 SQL or Relational Algebra 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	3													
CO2													2	
CO3	2													
CO4		2				1			1	1				

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, Data Models, Schemas and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System environment, Centralized and Client-Server Architecture for DBMSs.	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,CO4
III	Relational Model: The Relational Model Concepts, Relational Model Constraints and Relational Database Schemas. Basic SQL: SQL Data Definition and Data Types, Specifying Constraints in SQL, Basic retrieval Queries in SQL ,INSERT, DELETE AND UPDATE Statements in SQL More SQL: More complex SQL retrieval queries Advanced Queries, Specifying constraints as Assertions and Actions as Triggers, Views in SQL Relational Algebra: Unary Relational Operations: Select and Project, Relational Algebra Operations from SetTheory, Binary Relational Operations: Join and Division, Examples of Queries in Relational Algebra.	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.	CO1,CO3, CO4
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.

References

1. Data base System Concepts, Abraham Silberschatz, Henry F Korth, S. Sudarshan, Fifth Edition, McGraw Hill.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, Third Edition, TMH.
3. Introduction to Database Systems, C.J.Date, Eighth Edition, Pearson

e-Resources and other Digital Material:

1. <https://nptel.ac.in/courses/106/105/106105175/>
 2. https://onlinecourses.nptel.ac.in/noc21_cs04/ 3.
- <https://nptel.ac.in/courses/106/106/106106093/>