	Course Title: DATABASE MANAGEMENT SYSTEMS		
	Course Code : 21CST503	**No. of Credits: 3: 0: 0 (L-T-P)**	**No. of lecture hours/week : 3**
	Exam Duration : 3 hours	**CIE+ Assignment + SEE = 45+5+50=100**	**Total No. of Contact Hours : 42**

	Description
Course Objectives:	1. To understand the different issues involved in the design and implementation of a database system. 2. To study the physical and logical database designs, database modeling, relational algebra concepts. 3. To understand and use data manipulation language to query, update and manage a database. 4. To develop an understanding of essential DBMS concepts such as normalization and transaction concepts.

Unit No	**Syllabus Content**	**No of Hours**
1	**Introduction:** Introduction, an example, Characteristics of Database approach; Advantages of using DBMS approach; Data models, schemas and instances; three schema architecture and data independence; Database languages and interfaces; Classification of Database management systems. Entity-Relationship 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; Refining the ER Design, ER to relational schema diagram mapping	9
2	**Relational Model and Relational Algebra:** Relational Model Concepts; relational Model constraints and Relational Database Schemas; update operations, Transactions and dealing with constraint violations; Unary Relational Operations; SELECT and PROJECT; Relational Algebra Operations from Set Theory; Binary Relational Operations: JOIN and DIVISION; Additional Relational Operations; Examples of Queries in Relational Algebra.	8
3	**SQL:** Specifying basic constraints in SQL; schema change statements in SQL; Basic queries in SQL; More complex SQL queries-Insert, Delete and Update statements in SQL; Specifying constraints as Assertion and Trigger; Views (Virtual Tables) in SQL.	8
4	**Database Design:** Informal Design Guidelines for Relation Schemas; Functional Dependencies; Normal Forms Based on Primary Keys; General Definitions of Second and Third Normal Forms; Boyce-Cod Normal form, Properties of Relational Decompositions; Algorithms for relational Database Schema Design; Multi-valued Dependencies and Fourth Normal Form; Join Dependencies and Fifth Normal Form	9

5	**Transaction Management:** Transaction and System Concepts, Desirable Properties of Transactions, characterizing schedules based on Recoverability, characterizing schedules based on Serializability. Two-Phase Locking Techniques for Concurrency Control, Concurrency Control based on Timestamp ordering.	8

Course Outcomes	Description	RBT Levels
CO1	Understand the basic concepts and architecture associated with DBMS so as to employ the conceptual and relational models to design large database systems.	**L4**
CO2	Create, maintain and manipulate a relational database using SQL.	**L4**
CO3	Analyze the database design & normalize it so that the data conforms to design principles.	**L4**
CO4	Apply the characteristics of database transactions and assess how they affect database integrity and consistency.	**L3**

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	P06	PO 7	PO8	PO9	PO10	PO11	PO12
CO1	**3**	**3**	**3**	**2**								
CO2	**3**	**3**	**3**	**3**	**2**							
CO3	**3**	**3**	**2**	**2**								
CO4	**2**	**2**	**2**									

Strong -3 Medium -2 Weak -1

TEXT BOOKS:

1. Fundamental of Database Systems by Elmasri and Navathe, 7th Edition, Addison-Wesley, 2015, **ISBN-10:** 0133970779, **ISBN-13:** 978-0133970777

REFERENCE BOOKS:

1. Database Management Systems by Raghu Ramakrishnan and Johannes Gehrke – 3rd Edition, McGraw-Hill, 2006.
2. An Introduction to Database Systems by C.J. Date, A. Kannan, S. Swamynathan, 8th Edition, Pearson Education,2013.
3. Data Base system Concepts by Silberschatz, Korth and Sudharshan, 5th edition McGraw Hill, 2011.

SELF STUDY REFERENCES / WEBLINKS:

1. Database Management System: https://onlinecourses.nptel.ac.in/noc19_cs46/course
2. Introduction to Database Management Systems: https://www.youtube.com/watch?v=OMwgGL3lHlI&list=PLBlnK6fEyqRiyryTrbKHX1Sh9luYI0
3. SQL Tutorial - Full Database Course for Beginners: https://www.youtube.com/watch?v=HXV3zeQKqGY

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