# 20CS31O2 - DATABASE MANAGEMENT SYSTEMS

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| Course Category: | Open Elective | Credits: | 3 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 3-0-0 |
| Prerequisite: | Knowledge of basic computer programming  Knowledge of basic mathematical concepts such as sets, functions etc.  Students must have taken the introductory course in computer programming | Sessional Evaluation:  Univ. Exam Evaluation:  Total Marks: | 40  60  100 |
| Objectives: | * Understand the areas of databases and composition of queries using Structured Query Language * To study various database design models for building applications * Evaluate a business situation while designing a database system | | |

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| Course Outcomes | Upon successful completion of the course, the students will be able to: | |
| CO1 | Identify basic concepts that explores the applications and architectures of database systems. |
| CO2 | Recognize the Relational Model and the Relational Algebraic operations. |
| CO3 | Write basic SQL queries. |
| CO4 | Apply Normalization and construct complex SQL queries. |
| CO5 | Recognize the basic concepts of transaction & concurrency control techniques. |
| CO6 | Demonstrate the Security issues of database. |
| Course Content | UNIT-I  **Introduction to Databases**: Characteristics of a Database, Advantages, A brief history of database applications, When not to use DBMS.  **Overview of Database languages and architectures**: Data models, Schemas and Instances, Three-schema architecture, Data independence, Centralized and Client/Server Architecture for DBMS, Classification of DBMS**.**  UNIT-II  **Data Modeling Using (ER) Model**: High level conceptual data models, Entity types, Entity sets, Attributes, Keys, Relationship types, Weak entity types, ER diagrams, Naming conventions and Design Issues.  **Basic Relational Model**: Relational model concepts, Constraints and Relational Database Schemas, Update Operations, Transactions and Dealing with Constraint Violations.  UNIT-III  **Formal Relational Languages:** Unary relational operations, relational algebra operations, binary relational operations.  **Basic SQL:** Data definition and types, specifying constraints, Basic Retrieval Queries, INSERT, UPDATE, DELTE.  UNIT-IV  **Functional Dependencies and Normalization**: Design Guidelines for Relation Schemas, Functional dependencies, First,2nd and 3rd normal forms, Boyce-Codd normal form, Multivalued dependencies (4th normal form), Join dependencies (5th normal form.  UNIT-V  **Introduction to Transaction:** Transaction Processing**,** Transaction and System Concepts, Desirable Properties of Transactions, Characterizing Schedules Based on Recoverability.  UNIT-VI  **Database Security:** Security Issues, Discretionary Access Control based on Granting and Revoking Privileges, Mandatory Access Control and Role Based Access Control for Multilevel Security. | |
| Text Books &  References  Books | **TEXT BOOKS:**   1. Ramez Elmasri, and Shamkant B Navathe, Database Systems, 6th edition, Pearson Education,2011   **REFERENCE BOOKS:**   1. Silberschatz A, Korth H F, and Sudarshan S, Database System Concepts, 5th edition, McGraw-Hill, 2006. 2. Ramakrishnan R, and Gehrke J, Database Management Systems, 3rd edition, McGraw-Hill, 2003. | |
| E-Resources | 1. <https://docs.ccsu.edu/curriculumsheets/ChadTest.pdf> 2. <https://nptel.ac.in/courses> 3. <https://freevideolectures.com/university/iitm> | |