# 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: | 4060100 |
| 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 &ReferencesBooks | **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.
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| E-Resources | 1. <https://docs.ccsu.edu/curriculumsheets/ChadTest.pdf>
2. <https://nptel.ac.in/courses>
3. <https://freevideolectures.com/university/iitm>
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