# 19CS1203 - DATABASE MANAGEMENT SYSTEMS

**(Common to CSE & IT)**

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| Course Category: | Core | Credits: | 3 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 3-0-0 |
| Prerequisite: | Basic foundations in mathematics and preliminary fundamentals of data sets | Sessional Evaluation:  Univ. Exam Evaluation:  Total Marks: | 40  60  100 |
| Objectives: | Students undergoing this course are expected to:   1. Understand the areas of databases and composition of queries using Structured Query Language. 2. Study various database design models for building applications. 3. 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 | Have a general overview of the nature and purpose of database systems. |
| CO2 | Understand the concepts of E-R model and Relational Model. |
| CO3 | Learn basic SQL primitives and Relational Algebraic operations. |
| CO4 | Familiar with relational Data Base design techniques and Normal forms. |
| CO5 | Understand variety of storage devices, files, and data-storage structures. |
| CO6 | Identify the basic issues of query and transaction processing. |
| Course Content | UNIT – I  **Introduction**: Database-System Applications, Purpose of Database Systems , View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Database Users and Administrators, History of Database Systems.  UNIT – II  **Entity-Relationship Model:** Overview of the Design Process, The Entity- Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams**.**  **Relational Model:** Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.  UNIT – III  **SQL:** Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub queries, Modification of the Database.  **Other Relational Languages:** The Relational Algebra, The Tuple Relational Calculus  UNIT – IV  **Relational** Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional- Dependency Theory, Algorithms for Decomposition, Decomposition Using Multi valued Dependencies, More Normal Forms.  UNIT – V  **Storage and File Structure:** Overview of Physical Storage Media, Magnetic Disk and Flash Storage, File Organization, Organization of Records in Files, Data- Dictionary Storage, Database Buffer.  **Indexing and Hashing:** Basic Concepts, Ordered Indices, B+-Tree Index Files,B+- Tree Extensions, Static hashing, Dynamic Hashing  UNIT – VI  **Query Processing:** Overview, Measures of Query Cost, Join Operation.  **Transactions:** Transaction Concept, A Simple Transaction Model, Storage Structure Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels Transactions as SQL Statements. | |
| Text Books &  References  Books | **TEXT BOOKS**   1. Silberschatz A, Korth H F, and Sudarshan S, Database System Concepts, 6th edition, McGraw-Hill, 2009.   **REFERENCE BOOKS**   1. Ramez Elmasri, and Shamkant B Navathe, Database Systems, 6th edition, Pearson Education 2. Ramakrishnan R, and Gehrke J, Database Management Systems, 3rd edition, McGraw-Hill, 2003. 3. Date C J, An Introduction to Database Systems, 7th edition, Pearson Education, 2000.Rob P, Database Systems – Design, Implementation, and Management, 7th edition, Thomson, 2007 | |
| E-Resources | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> | |