17CS41O2 - DATABASE MANAGEMENT SYSTEMS

(Common to ECE, EEE, CE and ME)

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| **Course Category:** | Open Elective | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 2-2-0 |
| **Prerequisite:** | Basic foundations in mathematics and preliminary fundamentals of data and information | **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 | Master the basic concepts of Database management systems and their applicability |
| CO2 | Understand Relational Model and study the Relational Algebraic operations. |
| CO3 | Learn ER model and its usage in database design and application development |
| CO4 | Familiar with SQL basics to create simple databases |
| CO5 | Identify the basic issues of normalization and exposure on relational database design. |
| CO6 | Acquire knowledge in Transaction Management and Recovery techniques. |
| **Course Content** | UNIT – I  **INTRODUCTION** : Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Data Storage and Querying, Transaction Management, Database Architecture, Database Users and Administrators.  UNIT – II  RELATIONAL MODEL: Structure of Relational Databases, Fundamental Relational-Algebra Operations, Additional Relational-Algebra Operations, Extended Relational-Algebra Operations, Null Values, Modification of the Database.  UNIT – III  DATABASE DESIGN AND THE E-R MODEL: Overview of the Design Process, The Entity-Relationship Model, Constraints, Entity- Relationship Diagrams, Entity-Relationship Design Issues, Weak Entity Sets, Extended E-R Features, Reduction to Relational Schemas, Other Aspects of Database Design.  UNIT – IV  SQL: Data Definition, SQL Data Types and Schemas, Integrity Constraints, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Modification of the Database, Joined Relations.  UNIT – V  **RELATIONAL DATABASE DESIGN:**Features of Good Relational Design, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional Dependency Theory, Algorithms for Functional Dependencies, Decomposition Using Multivalued Dependencies ,More Normal Form, Database-Design Process .  UNIT – VI  **TRANSACTION MANAGEMENT AND RECOVERY**: Lock Based and timestamp based Protocols,Multiple Granularity, Multiversion Schemes, Deadlock Handling, Weak Levels of Consistency, Recovery and Atomicity, recovery algorithm, Buffer Management,Remote Backup Systems. | |
| **Text Books and References:** | **Text Books:**   1. Silberschatz, Korth, Sudarshan, “Database System Concepts”, McGraw-Hill, 6thEdition, 2011.   **Reference Books:**   1. Ramez Elmasri and Shamkant Navathe, Durvasula V L N Somayajulu, Shyam K Gupta, “Fundamentals of Database Systems”, Pearson Education, 2006. 2. Thomas Connolly, Carolyn Begg, “Database Systems – A Practical Approach to Design, Implementation and Management”, Pearson Education, 3rd Edition, 2002. 3. Raghu Ramakrishna,”Database Management Systems”*,* Publisher: McGraw Hill, Thirdedition. | |
| **E-Resources** | 1. [**https://nptel.ac.in/courses**](https://nptel.ac.in/courses) 2. [**https://freevideolectures.com/university/iitm**](https://freevideolectures.com/university/iitm) | |