



Computer Science Paper II
Database Management System
[CORE COURSE]

Semester I	Credits: 2	Subject Code: BS12002	Lectures: 40
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Course Outcomes:

At the end of this course, the learner will be able to:

- Interpret the fundamental concepts of DBMS (PL/PgSQL)
- Develop an ability to understand database management operations
- Create an E-R Model for given requirements and convert the same into relational model.
- Analyze the raw data and design data dependencies.

Unit 1: DBMS & Conceptual Design

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- **Chapter 1: Introduction to DBMS**
 - Data, Database and Concept of Database Management System(DBMS)
 - File system Vs DBMS
 - Structure of DBMS
 - Users of DBMS
 - Advantages of DBMS
 - Data models (relational, hierarchical, network)
 - Levels of abstraction
 - Data independence
 - Database Languages(DDL, DML,DCL,TCL)
- **Chapter 2 :Conceptual Design (Entity-Relationship Model)**
 - E-R Data Model (entities, attributes, entity sets, relations, relationship sets)
 - Additional constraints (key constraints, participation constraints)
 - Weak and Strong entity
 - Aggregation and Generalization
 - Conceptual design using E-R (entities Vs attributes, entity Vs relationship, binary Vs ternary)
 - Conceptual design for small to large enterprises
 - Activity
 - Case study based on E-R model

Unit 2: Structured Query Language

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- **Structured Query Language**
 - Introduction to query languages
 - SQL: Basic structure
 - DDL Commands
 - DML Commands
 - Forms of a basic SQL query (Expression and strings in SQL)
 - Set operations
 - Aggregate Operators and functions

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- o Date and String functions - o Null values - o Nested Subqueries - o SQL mechanisms for joining relations (inner joins, outer joins and their types) - o Views - o Examples on SQL (case studies)	
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Unit 3: Relational Database Design	12
• Chapter 4: Relational Database Design - o Introduction to Relational-Database Design (undesirable properties of a RDB design) - o Functional Dependency(Basic concepts, F+, Closure of an Attribute set, Armstrong's axioms) - o Concept of Decomposition - o Desirable Properties of Decomposition (Lossless join, Lossy join, Dependency Preservation) - o Concept of normalization, Normal Forms (1NF,2NF and 3NF), Examples - o Keys Concept with Examples : Candidate Keys and Super Keys, Algorithm to find the super keys / primary key for a relation	

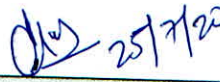
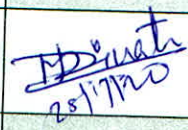
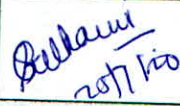
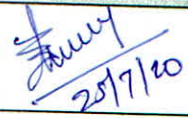
***Contact hours – 5 hours**

Reference Books:
• AviSilberschatz, Henry F. Korth, S. Sudarshan, <i>Database System Concepts</i>-6th edition- McGraw-Hill • Elmasri, Navathe, <i>Fundamentals of Database Systems</i> -5th edition –Pearson. • Joshua D. Drake, John C Worsley, <i>Practical Postgresql</i> ,(O'Reilly publications) • Raghu Ramakrishnan, <i>Database Management Systems</i>, McGraw-hill higher Education, ISBN:9780071254342 • Raghu Ramakrishnan and Johannes Gehrke, <i>Database Management Systems</i>, McGraw-Hill Science/Engineering/Math; 3 edition, ISBN: 9780072465631

Websites:
• http://www.postgresql.org/docs/9.3/static/tutorial.html

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