

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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<ul style="list-style-type: none">o Date and String functionso Null valueso Nested Subquerieso SQL mechanisms for joining relations (inner joins, outer joins and their types)o Viewso Examples on SQL (case studies)	
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Unit 3: Relational Database Design	12
<ul style="list-style-type: none">• Chapter 4: Relational Database Design<ul style="list-style-type: none">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 Decompositiono Desirable Properties of Decomposition (Lossless join, Lossy join, Dependency Preservation)o Concept of normalization, Normal Forms (1NF,2NF and 3NF), Exampleso Keys Concept with Examples : Candidate Keys and Super Keys, Algorithm to find the super keys / primary key for a relation	

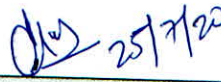



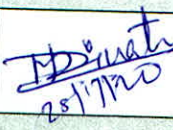

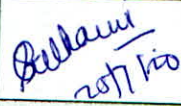
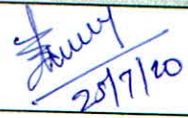
***Contact hours – 5 hours**

Reference Books:
<ul style="list-style-type: none">• 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:
<ul style="list-style-type: none">• http://www.postgresql.org/docs/9.3/static/tutorial.html

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