COURSE TITLE	**DATABASE MANAGEMENT SYSTEM**
COURSE CODE	**05MB0105**
COURSE CREDITS	**4**

Objective:

1 Aim to provide an overview of databases, including data management systems, relational databases, data models, and database architecture.

2 Goal is to provide a comprehensive understanding of data models, including ER and relational models, along with key operations and constraints in DBMS.

3 Teach relational database design concepts, including functional dependency, normalization, concurrency control, and the ACID property in DBMS.

4 Cover SQL statements and functions for data manipulation, definition, control, constraints, operators, group by, order by, joins, dependencies, and functions in DBMS.

5 Covers PL/SQL concepts such as cursors, stored procedures, stored functions, and triggers in database management systems.

Course Outcomes: After completion of this course, student will be able to:

1 Gain an understanding of databases, encompassing data management systems, relational structures, data models, and architectural components.

2 Students can design ER and relational models, as well as essential operations and constraints within database management systems.

3 Students will master relational database design principles, including functional dependency, normalization, concurrency control, and the ACID property, facilitating adept management of databases within DBMS.

4 students will be proficient in utilizing SQL statements and functions for diverse data operations within DBMS environments.

5 Students will acquire proficiency in PL/SQL concepts including cursors, stored procedures, stored functions, and triggers, enhancing their capability in database management systems.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	4	50	30	20	0	50

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Contents : Unit	Topics	Contact Hours
1	**Introduction to Database & Data Models** Understanding Data, Database, and Database Management System, Types of Databases, what is RDBMS, DBMS vs RDBMS, Introduction Data Models, DBMS Architecture, Data Model Schema, ER Model Concept, ER Diagram, Mapping Constraints, DBMS Keys, DBMS Generalization, DBMS Specialization, DBMS Aggregation, Relation Model Concept, Relational Algebra, Join Operation, Constraints	15
2	**Relational Database Design & SQL** Functional Dependency, DBMS Normalization. Concurrency Control, ACID Property., SQL Statements with DML, DDL, SQL Statements with DCL, TCL, DBMS Constrains, Operators , Group By, Order By , Joins, Dependencies, Functions, Cursors , Stored Procedures & Stored Functions, Triggers	15
Total Hours		**30**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Unit 1** Create a simple relational database schema with tables for storing student information. Develop a relational database management system for Zomato database management system., Define the primary keys for each table and establish relationships between them., Perform insert duplicate data in the table which have primary and not null constraint., Define Not Null for each table and establish relationships between them., Write a SQL statement to insert sample data into the tables and practice querying to retrieve specific information, Write a SQL statement to create and drop tables in a relational database using SQL commands, Design an entity-relationship (ER) diagram for a given scenario, Design an entity-relationship (ER) diagram for a given scenario. (School Management System), Design an entity-relationship (ER) diagram for a given scenario. (Hospital Management System), Design an entity-relationship (ER) diagram for a given scenario. (Company Management System), Design an entity-relationship (ER) diagram for a given scenario. (Library Management System)., Design an entity-relationship (ER) diagram for a given scenario and translate it into a relational database schema. , Design an entity-relationship (ER) diagram for a given scenario and translate it into a relational database schema. (Hospital Management System), Design an entity-relationship (ER) diagram for a given scenario and translate it into a relational database schema. (Company Management System). Design an entity-relationship (ER) diagram for a given scenario and translate it into a relational database schema. (Library Management System). Design an entity-relationship (ER) diagram for a given scenario and translate it into a relational database schema. (School Management System).	30

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
2	**Unit 2** Write a SQL statement to explore SQL clauses (WHERE) to filter data. Write a SQL statement to explore SQL clauses (WHERE) to sort data. Write a SQL statement to explore SQL clauses (WHERE) to group data., Write a SQL statement to explore SQL clauses and find the top and least element from the table., Write a SQL statement to explore basic data manipulation operations such as inserting new records, updating existing records, and deleting records., In your SQL statement apply to alter command in table and change the column name, drop data, change the datatype of the column, and add the column in Table., Design a database schema for a social media platform, considering factors such as user profiles, posts, comments, and relationships., Write a SQL statement to explore SQL clauses (ORDER BY) to filter, sort, and group data. Write a SQL statement to explore SQL clauses (GROUP BY) to filter, sort, and group data. Write a SQL statement to explore DDL commands (CREATE) to modify the structure of a database schema. Write a SQL statement to explore DDL commands (ALTER) to modify the structure of a database schema.., Experiment with DDL commands (DROP) to modify the structure of a database schema., Write a SQL statement to explore different JOIN operations (INNER JOIN) to retrieve data from multiple related tables. Write a SQL statement to explore different JOIN operations (LEFT JOIN) to retrieve data from multiple related tables. Write a SQL statement to explore different JOIN operations (RIGHT JOIN) to retrieve data from multiple related tables. Write a SQL statement to explore different JOIN operations (FULL JOIN) to retrieve data from multiple related tables.., Write a SQL statement to explore different JOIN operations (INNER JOIN, LEFT JOIN, RIGHT JOIN) to retrieve data from multiple related tables.	30
Total Hours		**60**

Textbook :

1 Database System Concepts, Abraham Silberschatz, Henry F. Korth, and S. Sudarshan, McGraw-Hill Education, 2019

References:

1 Database Systems: The Complete Book, Database Systems: The Complete Book, Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom, Pearson, 2008

2 Database Systems: Design, Implementation, and Management, Database Systems: Design, Implementation, and Management, Carlos Coronel and Steven Morris, Cengage Learning, 2014

3 Database System Concepts, Database System Concepts, Abraham Silberschatz, Henry F. Korth, and S. Sudarshan, McGraw-Hill Education, 2019

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References:

4 Introduction to Database Management System, Introduction to Database Management System, Aditya Mittal and Satinder Bal Gupta, Laxmi Publications, 2016

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

1 Board work
2 PPT
3 Demo

Supplementary Resources:

1 https://www.tutorialspoint.com/dbms/index.htm
2 https://www.javatpoint.com/dbms-tutorial

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