As per Choice Based Credit System (CBCS) scheme    (Effective from the academic year 2017-2018)	-
Subject Code  Number of Lecture Hours/Week  Number of Lecture Hours  So  CREDITS - 04  Total Number of Lecture Hours  CREDITS - 04  Total Number of Lecture Hours  So  CREDITS - 04  Texam Hours  Overview of Databases: Introduction, Characteristics of database applications. Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. Conceptual Data Modelling using Entities and Relationships: Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, Entity sets, examples, Specialization and Generalization.  Textbook 1: Ch 1.1 to 1.8, 2.1 to 2.6, 3.1 to 3.10  Relational Model: Relational Model Concepts, Relational Model Constraints with constraint violations. Relational Algebra: Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-Relational mapping. SQL: SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, additional features of SQL.  Textbook 1: Ch 1.1 to 4.5, 5.1 to 5.3, 6.1 to 6.5, 8.1; Textbook 2: 3.5  Module - 3  SQL : Advances Queries: More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL Database Application Development: Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The intermet Bookshop. Internet Applications: Textbook 1: Ch 7.4; Textbook 2: 6.1 to 6.6, 7.5 to 7.7.  Module - 4  Normalization: Database Design Theory – Introduction to Normalization using leading schema, inference Rules, Equivalence, and Minimal over, Properties of Relational Decompositions, Alporithms: Inference Rules, Equivalence, and Mi	
Number of Lecture Hours/Week  Total Number of Lecture Hours  Total Model Constraints  Total Model	
Total Number of Lecture Hours   50   Exam Hours   03	
Module – 1  Introduction to Databases: Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications. Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. Conceptual Data Modelling using Entities and Relationships: Entity types, Entity sets, examples, specialization and Generalization.  Textbook 1:Ch 1.1 to 1.8, 2.1 to 2.6, 3.1 to 3.10  Module – 2  Relational Model: Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-Relational mapping. SQL: additional features of SQL.  Textbook 1: Ch 1.1 to 4.5, 5.1 to 5.3, 6.1 to 6.5, 8.1; Textbook 2: 3.5  Module – 3  Module – 4  Module – 5  Module – 5  Module – 6  Module – 7  Module – 7  Module – 7  Module – 8  Module – 9  Mo	
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## Textbook 1: Ch14.1 to 14.7, 15.1 to 15.6 Module - 5 Transaction Processing: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing 10 Hours schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL. Concurrency Control in Databases: Two-phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking. Introduction to Database Recovery Protocols: Recovery Concepts, NO-UNDO/REDO recovery based on Deferred update, Recovery techniques based on immediate update, Shadow paging, Database backup and recovery from catastrophic failures Textbook 1: 20.1 to 20.6, 21.1 to 21.7, 22.1 to 22.4, 22.7.

## Course outcomes: The students should be able to:

- Summarize the concepts of database objects; enforce integrity constraints on a
- Use Structured Query Language (SQL) for database manipulation.
- Design simple database systems
- Design code for some application to interact with databases.

## Question paper pattern:

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module. Text Books:

- Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th
- Database management systems, Ramakrishnan, and Gehrke, 3<sup>rd</sup> Edition, 2014,

## Reference Books:

- 1. Silberschatz Korth and Sudharshan, Database System Concepts, 6th Edition, Mc-
- 2. Coronel, Morris, and Rob, Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.

Dept. Of Computer Science & Engineering Alva's Institute of Engg. & Teathcology Mijar, MOODBIDRI - 574 228