RKUNIVERSITY

SYLLABUS

Course Title	**Relational Database Management System (RDBMS)**
Course Code	**MIT202**
Course Credit	Theory(Hrs) : 4
	Practical(Hrs) : 2
	Tutorial(Hrs) : 0
	Credits : 5

Course Description

- Effective transformation of the real-world data into the relational data model of the database system and data retrieval.
- Clear understanding for the need of a database.
- Ability to store information without unnecessary redundancy.
- Clear understanding of the concept of transaction, commit and rollback facilities.

Course Objectives

Introduces the student to the fundamental concepts necessary for designing, using and Implementing database systems and applications.

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	Section – I	

1	**Introduction to Database System Basic Concepts :** data, database, database systems, database management systems, instance, schema, Database Applications, Purpose and Advantages of Database Management System (over file systems), View of Data (Data Abstraction, Data Models), Database Languages (DML, DDL), Relational Databases (Tables, DML, DDL), Data Storage and Querying (Components, Storage Manager, Query Processor), Database Architecture, Database User and Administrators.	**08**
2	**Entity Relationship Diagram:** Design Phases, Design Alternatives (Major Pitfalls), Entity Relational Model (Entity Sets, Relationship Sets, Attributes), Constraints (Mapping Cardinalities, Keys, Participation Constraints), Entity Relationship Diagram, Weak Entity Set, Extended E-R Features (Generalization, Specialization and Aggregation), E-R Notations, Examples of ERD.	**08**
3	**Database Design:** Features of Good Relational Design, Atomic Domain and First Normal Form, Decomposition Using Functional Dependency (Key and Functional Dependency, BCNF, 2NF, 3NF), Functional Decomposition Theory (Closure Set of Functional Dependency with Armstrong Rules, Canonical Cover and Loseless Decomposition), Dependency Preservation, Comparison of 3NF and BCNF, Decomposition Using Multi-Valued Dependencies (Multi-Valued Dependency and 4 NF).	**10**
Section – II		
4	**Relational Model:** Structure of Relational Databases (Basic Structure, Database Schema, Types of Keys), Fundamental Relational Algebra Operations (Select, Project, Union, Intersection).	**07**
5	**Transaction Concepts:** Transaction Concept (Transaction State, Basic Definitions, ACID Property), Implementation of Atomicity and Durability (Shadow Paging Concept), Concurrent Execution (Reasons of Concurrent Execution, Serial and Concurrent Schedule), Serializability (Conflict and View Serializability), Recoverability of Schedules (Recoverable Schedule and Cascade-less Schedule), Lock-based Protocol (Types of Lock and Deadlock Concept), Two-Phase Locking Protocol, Deadlock Handling (Deadlock Prevention Techniques like Wait-Die, Wound-Wait), Recovery of Deadlock (Selection of Victim, Rollback, Starvation), Insert and Delete Operations (Delete, Insertion).	**15**
6	**Overview of Data Warehousing and Mining:** Data Warehousing (concept, components and characteristics), Mining (process and Applications)	**04**

Text Books

- Title: “Database System Concepts”, 5th Edition, McGraw Hill Publication
  Authors: Silberschatz, Korth, Sudarshan
- Title: ”SQL, PL/SQL – The programming Language of Oracle”, BPB Publications,
  Authors: Ivan Bayross

Reference Books

- Title: “An Introduction to Database Systems”, 8th Edition, Pearson Education
  Authors: C J Date, A Kannan, S Swaminathan
- Title: “Database Systems: Concepts, Design and Applications”, Pearson Education.
  Authors: S K Singh
- Title: “Fundamentals of Database Systems”, 5th Edition, Pearson Education
  Authors: Elmsari, Navathe
- Title: “Database Systems : Design, Implementation and Management” 7th Edition, Cengage Learning
  Authors: Peter Rob, Carlos Coronel

List of Experiments Assignments and Evaluation

The professor can assist the students in various ways, including assignment of supplemental material, additional discussions and one-on-one tutoring.The discussions are meant to provide a cooperative, group problem-solving environment. The professor will introduce the assignments at the end of each class. The students have a maximum of one week to resolve the point at hand. **ERD and Normalization:** It is recommended to give at least one case study, which requires students to analyze problem, draw ERD, convert ERD into tables and normalize the tables.

Instructional Approach

- Lectures will be conducted with the aid of multi-media projector, blackboard, OHP etc.
- Though the majority of the class will be lecture, certain skill building exercises will be introduced to expose the students to increasingly more difficult technical information.
- Minimum five experiments shall be there in the laboratory related to course contents.
- Viva will be conducted after the completion of course.