|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Name:** | | | | | | | Database Management System | | | | | | | | | | | | | | | | | | | **Subject Code:** | | | | | | | | TMC 204 | | |
|  | | | | | | |  | | | | | | | | | | | | | | | | | | |  | | | | | | | |  | | |
| **Course Name:** | | | | | | | Master of Computer Applications (MCA) | | | | | | | | | | | | | | | | | | |  | | | | | | | |  | | |
|  | | | | | | |  | | | | | | | | | | | | | | | | |  | | | | | | | | |  | | | |
| **1** | **Contact Hours:** | | | | | | | | | 45 | | |  | | | | | | | | | | | | | | **L** | | 3 | | | **T** | | 0 | **P** | 0 |
|  |  | | | | | | | | |  | | |  | | | | | | | | | | | | | |  | |  | | |  | |  |  |  |
| **2** | **Examination Duration(Hrs):** | | | | | | | | | | | | | | |  | **Theory** | | | 0 | 3 |  | **Practical** | | | | | 0 | | 0 | |  | | | | |
|  |  | | | | | | | | | | | | | | |  |  | | |  |  |  |  | | | | |  | |  | |  | | | | |
| **3** | **Relative Weightage:** | | | | | | | | | |  | | | | **CWE:** | | | | 25 | **MTE:** | | | 25 | | **ETE:** | | | | 50 | | | |  | | | |
|  |  | | | | | | | | | |  | | | |  | | |  | |  | | |  | |  | | | |  | | | |  | | | |
| **4** | **Credits** | | | | | 0 | | 3 | |  | | | | | | | |  | |  | | |  | |  | | | |  | | | |  | | | |
|  |  | | | | |  | |  | |  | | | | | | | |  | |  | | |  | |  | | | |  | | | |  | | | |
| **5** | **Pre-Requisite:** | | | | | | | | | Basic of Computer Science. | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **6** | **Subject Area:** | | | | | | | | | Computer Science. | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **7** | **Objective:** | | | | | | | | To familiarize students with the concepts of Database and their application in real life software development | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | |
| **8** | **Course Outcome:** | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | |
|  | A student who successfully fulfills the course requirements will be able to: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 1** | | | | Understand the concepts of database management and can differentiate the database approach with the file system approach. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 2** | | | | Sketch and develop Entity Relationship Diagrams for real world problems and design databases. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 3** | | | | Apply and analyze Relational database queries with the help of Structured Query Language (SQL) and construct simple and moderately advanced database queries in SQL/PL-SQL. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 4** | | | | Understand the basics of NoSQL and differentiate it with relational databases. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 5** | | | | Evaluate and Apply logical database design principles, including keys, constraints and database normalization and design normalized databases. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 6** | | | | Understand and defend the importance of concurrency control in Transaction Processing Systems . | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **9** | | **Details of the Course:** | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | |
| **Unit No.** | | | | **CONTENT** | | | | | | | | | | | | | | | | | | | | | | | | | | | **CONTACT HOURS** | | | | | |
| **1** | | | | **Introduction to DBMS:** An overview of database management system, Database System Vs File System, Database system concepts, data models. Advantages of DBMS, Schema and instances, Three schema architecture, data independence. Data base languages and interfaces, Disadvantages of DBMS. | | | | | | | | | | | | | | | | | | | | | | | | | | | **5** | | | | | |
| **2** | | | | **Data Modeling and Entity Relationship Model:** ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, Candidate key, Primary key, Generalization, Specialization and Aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree, ER Case Studies.  **Relational Data Base Model (RDBMS)**: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, Relational algebra: operations and queries. | | | | | | | | | | | | | | | | | | | | | | | | | | | **7** | | | | | |
| **3** | | | | **Introduction to SQL:** Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, DDL, DML, DCL, and DQL statements, SQL operators and their use, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joins, Unions, Intersection, Minus.  Overview of PL/SQL, Variables, Datatypes, Conditions, Loops, Procedures, Functions, Triggers and cursors.  Introduction to NoSql Database, Comparison of NoSql with Relational Database, Types of NoSql Databases. | | | | | | | | | | | | | | | | | | | | | | | | | | | **13** | | | | | |
| **4** | | | | **High Level Data Base Design & Normalization:** Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs. | | | | | | | | | | | | | | | | | | | | | | | | | | | **8** | | | | | |
| **5** | | | | Transaction Processing Concepts: Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.  **Concurrency Control**: Concurrency control mechanism, locking Techniques for concurrency control. | | | | | | | | | | | | | | | | | | | | | | | | | | | **8** | | | | | |
|  | | | | **TOTAL** | | | | | | | | | | | | | | | | | | | | | | | | | | | **42** | | | | | |
|  | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | |
|  | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | |
| **11** | | **Suggested Books:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | |
| **Sl. NO.** | | | **NAME OF AUTHORS/BOOKS/PUBLISHERS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **YEAR OF PUBLICATION** | | | | |
| **1** | | | Elmasri and Navathe: Fundamentals of Database Systems, 5th Edition, Pearson Education. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2007 | | | | |
| **2** | | | Silberschatz, Korth and Sudharshan: Data base System Concepts,5th Edition, Mc-GrawHill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2006 | | | | |
| **3** | | | C.J. Date, A. Kannan, S. Swamynatham: A Introduction to Database Systems, 8th Edition, Pearson education. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1996 | | | | |
| **4** | | | Raghu Ramakrishnan and Johannes Gehrke: Database Management Systems, 3rd Edition, McGraw-Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2003 | | | | |