**Course Content: Database Management Systems - BCSE2073**

|  |  |  |
| --- | --- | --- |
| **Unit 1** | **Introduction** | **9 hours** |
| Introduction: An overview of database management system, database system Vs file system, Database system concept and architecture, data model schema and instances, data independence and database language and interfaces, data definitions language, DML, Overall Database Structure. | | |
| **Unit II** | **Relational data Model and Language** | **9 hours** |
| Relational data model concepts, integrity constraints, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus. Introduction on SQL: Characteristics of SQL, advantage of SQL. SQl data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL | | |
| **Unit III** | **Data Base Design & Normalization** | **10 hours** |
| Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.. | | |
| **Unit-IV** | **Transaction Processing Concept** | **6 hours** |
| Transaction system, Testing of serializability, serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling. Distributed Database: distributed data storage, concurrency control, directory system. | | |
| **Unit-V** | **Concurrency Control Techniques** | **6 hours** |
| Concurrency control, Locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation-based protocol, multiple granularities, Multi version schemes, Recovery with concurrent transaction, case study of Oracle. | | |
| **Unit-VI** | **Advancements and Research** | **6 hours** |
| The advances and the latest trends in the course as well as the latest applications of the areas covered in the course. The latest research conducted in the areas covered in the course. Discussion of some latest papers published in IEEE transactions and ACM transactions, Web of Science and SCOPUS indexed journals as well as high impact factor conferences as well as symposiums. Discussion on some of the latest products available in the market based on the areas covered in the course and patents filed in the areas covered in the course. | | |

**Text Books**

1. “Database system concepts” Henry F Korth, Abraham Silberschatz, S. Sudurshan, McGraw- Hill

**Reference Books**

1. Date C J, “ An Introduction to Database Systems”, Addision Wesley
2. Elmasri, Navathe, “ Fundamentals of Database Systems”, Addision Wesley
3. O’Neil, Databases, Elsevier Pub.
4. Leon & Leon,”Database Management Systems”, Vikas Publishing House
5. Bipin C. Desai, “ An Introduction to Database Systems”, Gagotia Publications
6. Majumdar & Bhattacharya, “Database Management System”, TMH (14)
7. Ramkrishnan, Gehrke, “ Database Management System”, McGraw Hill