**Database Management System**

**UNIT-I** General introduction to database systems, Database-DBMS distinction, Approaches to building a database, Data models, Three-schema architecture of a database, Challenges in building a DBMS, Various components of a DBMS, E/R Data model. SQL, PL/SQL Concept

**UNIT-II** Relational Data Model, Concept of relations, Schema-instance distinction, Keys, referential integrity and foreign keys, Relational algebra operators, Tuple relation calculus, Domain relational calculus.

**UNIT-III** Physical and logical hierarchy. Concept of index, B-trees, hash index, function index, bitmap index. Concepts of Functional dependency, Normalization, Business data analysis, tools & techniques for business data analysis.

**UNIT-IV** Overview: Query Processing and Optimization, measures of query cost estimation in query optimization, pipelining and Materialization, Structure of query evaluation plans.

**UNIT-V** Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Logbased recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking

**UNIT-VI** Recovery System: failure classification, recovery and atomicity, log based recovery, checkpoints, buffer management, advanced recovery techniques. Introduction to Web databases, distributed databases, data warehousing and data mining, Data Security.

**TextBooks:** 1. Database System Concepts by AviSilberschatz , Henry F. Korth , S. Sudarshan, Tata McGraw Hill, Fifth Edition 2. Fundamentals of Database Systems – Elmasiri and Navathe, Addison Wesley, 2000. 3. An introduction to Database Systems,C J Date,A.Kannan,S.Swamynathan –Eight Edition

**Reference Books:** 1. Database Management Systems - by Raghu Ramakrishnan and Johannes Gehrke, Tata McGraw Hill Publication, Third Edition 2. Introduction to Database Management Systems by Kahate