COURSE OUTCOMES

At the end of the course students will be able to

CO1: understand fundamentals of database management systems.

CO 2: design database models and learn database languages to write queries to extract information from databases.

CO 3: Identify database anomalies and improve the design of database management system

CO 4: understand transaction management and concurrency control.

CO 5: understand storage organization and database recovery.

COURSE CONTENT

UNIT 1

Introduction: Database management system Characteristics of the Database, Database Systems and Architecture, Data Models, Schemes & Instances, DBMS Architecture & Data Independence, Database administrator & Database Users, Database Languages & Interfaces, DDL, DML, DCL, Overview Relational Data Base Management Systems

UNIT 2

Data Modeling: Data modeling using The Entity-Relationship Model – Entities, Attributes and Relationships, Cardinality of Relationships, Strong and Weak Entity Sets, Generalization, Specialization, and Aggregation, Translating your ER Model into Relational Model, Relationships of higher degree.

UNIT 3

Relational Model, Languages & Systems: Relational Data Model concepts, Relational

Model Constraints, integrity constraints ,Keys domain constraints, referential integrity, assertions triggers, foreign key

Relational Algebra and calculus, SQL. Database security.

Relational Data Base Design: Functional Dependencies & Normalization for Relational Databases, Functional Dependencies, Normal Forms Based on Primary Keys, (1NF, 2NF, 3NF & BCNF), Lossless Join and Dependency Preserving Decomposition, Functional dependencies and its closure, covers and equivalence.

Randomized algorithms: Randomized algorithms to be introduced a bit early, i.e., before NP-completeness to highlight randomization as an algorithmic technique. Application areas: Geometric algorithms: convex hulls, nearest neighbor, Voronoi diagram, etc. Algebraic and number-theoretic algorithms: FFT, primality testing, etc.

UNIT V

Graph algorithms: network flows, matching, etc. Optimization techniques: linear programming Reducibility between problems and NP-completeness: discussion of different NP-complete problems like satisfiability, clique, vertex cover, independent set, Hamiltonian cycle, TSP, knapsack, set cover, bin packing, etc. Backtracking, branch and bound, Approximation algorithms: Constant ratio approximation algorithms.

REFERENCE BOOKS

1. **E. Horowitz, S. Sahni, and S. Rajsekaran, "Funadmentals of Computer Algorithms," Galotia Publication**
2. **T .H . Cormen, C .E .Leiserson, R .L .Rivest "Introduction to Algorithms", PHI.**
3. **Sedgewich, Algorithms in C, Galgotia**
4. **Berman. Paul, "Algorithms, Cengage Learning".**
5. **Richard Neopolitan, Kumar SS Naimipour, "Foundations of Algorithms"**