**CS8492 DATABASE MANAGEMENT SYSTEMS L T P C 3 0 0 3**

**OBJECTIVES**

• To learn the fundamentals of data models and to represent a database system using ER diagrams.

• To study SQL and relational database design.

• To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.

• To understand the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.

• To have an introductory knowledge about the Storage and Query processing Techniques

**UNIT I RELATIONAL DATABASES 10**

Purpose of Database System – Views of data – Data Models – Database System Architecture – Introduction to relational databases – Relational Model – Keys – Relational Algebra – SQL fundamentals – Advanced SQL features – Embedded SQL– Dynamic SQL

**UNIT II DATABASE DESIGN 8**

Entity-Relationship model – E-R Diagrams – Enhanced-ER Model – ER-to-Relational Mapping – Functional Dependencies – Non-loss Decomposition – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form – Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

**UNIT III TRANSACTIONS 9**

Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Transaction Recovery - Save Points – Isolation Levels – SQL Facilities for Concurrency and Recovery.

**UNIT IV IMPLEMENTATION TECHNIQUES 9**

RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Algorithms for SELECT and JOIN operations – Query optimization using Heuristics and Cost Estimation.

**UNIT V ADVANCED TOPICS 9**

Distributed Databases: Architecture, Data Storage, Transaction Processing – Object-based Databases: Object Database Concepts, Object-Relational features, ODMG Object Model, ODL, OQL - XML Databases: XML Hierarchical Model, DTD, XML Schema, XQuery – Information Retrieval: IR Concepts, Retrieval Models, Queries in IR systems. **TOTAL: 45 PERIODS**

**OUTCOMES:** Upon completion of the course, the students will be able to:

• Classify the modern and futuristic database applications based on size and complexity

• Map ER model to Relational model to perform database design effectively

• Write queries using normalization criteria and optimize queries

• Compare and contrast various indexing strategies in different database systems

• Appraise how advanced databases differ from traditional databases.

**TEXT BOOKS:**

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ―Database System Concepts‖, Sixth Edition, Tata McGraw Hill, 2011.
2. Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems‖, Sixth Edition, Pearson Education, 2011.

**REFERENCES:**

1. C.J.Date, A.Kannan, S.Swamynathan, ―An Introduction to Database Systems‖, Eighth Edition, Pearson Education, 2006.

2. Raghu Ramakrishnan, ―Database Management Systems‖, Fourth Edition, McGraw-Hill College Publications, 2015.

3. G.K.Gupta,"Database Management Systems‖, Tata McGraw Hill, 2011.