

**Prasad V. Potluri Siddhartha Institute of Technology:: Vijayawada.
Department of Computer Science and Engineering**

I/II M.Tech. (CSE) - (First Semester)

17CSCS1T5B

**ADVANCED DATABASES
Elective - I**

Credits: 4**Lecture: 4 Periods/week**

**Internal Assessment: 40 Marks
Semester end examination: 60Marks**

Course Description:

This course is to familiarize students with the advanced concepts on data bases. It also comprehends the concepts of Query Processing & Optimization Techniques. It gives the knowledge of transaction processing and concurrency control & recovery techniques in emerging and advanced database models.

Course Outcomes:

At the end of this course, the graduate is able:

- CO1:** To understand the Processing and Optimization of Queries.
- CO2:** To interpret the transaction management Techniques.
- CO3:** To discuss Concurrency control Protocols and Database Recovery Techniques.
- CO4:** To understand basic concepts relevant to Emerging and Advanced Data base concepts & models.

UNIT 1

Introduction to Query Processing and Query Optimization Techniques: Translating SQL Queries into Relational Algebra, Algorithms for External Sorting, Algorithms for SELECT and JOIN Operations, Algorithms for PROJECT and Set Operations, Implementing Aggregate Operations and OUTER JOINS, Combining Operations Using Pipelining, Using Heuristics in Query Optimization, Using Selectivity and Cost Estimates in Query Optimization, Overview of Query Optimization in Oracle, Semantic Query Optimization.

UNIT 2

Foundations of Database Transaction Processing: Introduction to Transaction and System Concepts, Desirable Properties of Transactions, Characterizing Schedules Based on Recoverability, Characterizing Schedules Based on Serializability, Transactions Support in SQL.

UNIT 3

Concurrency Control and Database Recovery: Introduction to Protocols for Concurrency Control in Databases, Two-Phase Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Multi version Concurrency Control Techniques, Validation Concurrency Control Techniques, Granularity of Data Items and Multiple Granularity Locking, Using Locks for Concurrency Control in Indexes, Other Concurrency Control Issues. Recovery Techniques Based on Immediate Update, Shadow Paging, The ARIES Recovery Algorithm.

UNIT 4

Emerging database technologies and Advanced data Models: Mobile Data Management, Multimedia Data Management, Geographic Information Systems(GIS), Biological and Genomic Databases and Emerging Applications, Active Database Concepts and Triggers, Temporal Database Concepts, Spatial Database Concepts, Multimedia Database Concepts.

Text Book:

1. Ramez Elmasri, ShamkantB. Navathe, “Database Systems-Models, Languages, Design and Application Programming”, 6thEdition, Pearson.

References:

1. Abraham Silberschatz, Henry FKorth, S.Sudarshan, “Data base System Concepts”, 5thEdition, Mc Graw Hill.
2. Raghurama Krishnan, Johannes Gehrke, “Data base Management Systems”, 3rdEdition, TMH.