

GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Computer Application

Subject Name : Database Management Systems – II

Subject Code : 620006

Objectives: This course is intended to give students knowledge of how RDBMS is managed. It will prepare a theoretical as well as practical background of RDBMS.

Prerequisites: Database designing and retrieving using SQL and PL/SQL

Contents:

1. Transaction Processing and Concurrency control

Transaction concepts : Transaction execution and Problems, Transaction execution and control with SQL, Transaction properties, Transaction log, Concurrency control, Locking methods for concurrency control, Timestamp methods for concurrency control, Optimistic methods for concurrency control (Read phase, validation phase, Write phase), Deadlock handling – detection and resolution

2. Database backup and Recovery

Need of Database backup, Database backup techniques, Types of Database failures, Types of Database recovery (Forward recovery, Backward recovery, Media recovery), Recovery techniques (Deferred Update, Immediate update, Shadow Paging, Checkpoints), Buffer management.

3. Implementing Security in Databases

Security & integrity threats, Defense mechanisms, Statistical database auditing & control, Granting/revoking of privileges using SQL

4. Introduction to Other Databases

Overview of parallel databases, Overview of Distributed databases, Overview of Object oriented databases

5. Relational Algebra

Basic operators (Select, project, union, set, difference, Cartesian product and rename)

Additional operators (Set interaction, Natural Join, Division and Assignment operator),

Insert, Update, Delete operators.

6. Query Processing and Optimization

Overview, Query interpretation, Equivalence of expressions, Algorithm for executing query operations, Heuristics of Query, Optimization cost estimation of queries, Basic query optimization strategies: Selection operation, Sorting, Join operation

Main Reference books :

1. “Database Systems: Concepts, Design and Applications”, S. K. Singh., Pearson Education, (2006), ISBN: 978-81-7758-567-4.
2. “Database System Concepts”, Silberschatz, Korth, Sudarshan, Fifth Edition, McGraw Hill International Edition, ISBN: 007-124476-X.
3. “An Introduction to Database Systems”, C.J.Date, A. Kannan, S. Swaminathan, Pearson Education, Eighth Edition, (2006), ISBN: 978-81-7758-556-8

Suggested Additional Reading:

1. “Fundamentals of Database Systems”, Elmasri, Navathe, , Pearson Education , Fifth Edition (2008), ISBN: 978-81-317-1625-0
2. Database Management Systems, Ramakrishnan, Gehrke, , McGraw Hill, Third Edition.
3. “Database Systems: Design, Implementation and Management”, Peter Rob, Carlos Coronel, Cengage Learning , Seventh Edition (2007) ISBN-13: 978-81-315-0319-5 .

Chapter wise Coverage from the main reference book(s):

Book No. 1: Chapters – 4, 11, 14, 15, 17, 18

Book No. 2: Chapters-- 15, 16, 17

Accomplishments of the student after completing the course:

Knowledge of handling multiple transactions effectively, query processing and query optimization concepts.