

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Master of Computer Application

**Subject Name** : Database Management Systems-I

**Subject Code** : 610005

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**Objectives:** This course is intended to introduce the fundamental concepts necessary for designing , using and implementing Database systems and applications

**Prerequisites:** Basic Knowledge of working with Computer.

### Contents:

- 1. Introduction** : Basic Concepts: data, database, database systems, database management system, Purpose and advantages of Database management system (over file systems), data models: Introduction; Three level architecture, Overall architecture of DBMS, Various components of a DBMS
- 2. Relation Data Model** : Relational Structure – tables (relations), rows (tuples), domains, columns (attributes), Entity sets, attributes, Types of entities, Relationships (ER) and Types of relationships, Database modeling using entity and relationships, Enhanced entity relationship diagrams , keys: super key, candidate keys, primary key, entity integrity constraints, referential integrity constraints.
- 3. Database Design** : Relational structure – tables (relations), rows (tuples), domains, columns (attributes), Database design process, Anomalies in a database, Functional Dependencies (Lossless decomposition, Dependency preservation, Closure set of FD, Canonical Cover, Lossless Joins), Finding Candidate keys using Armstrong rules, Stages of Normalization: 1NF, 2NF, 3NF, BCNF (with general definition also) and Multivalued Dependency: 4NF & 5NF (Project Join NF) Translation of E-R schemes (logical design) to relational schemes (Physical design): A case study.
- 4. Data Dictionary & Utilities**  
Introduction to data dictionary, Usage of data dictionary.

### Main Reference books :

1. Database System Concepts- Silberschatz, Korth, Sudarshan, Fifth Edition, McGraw Hill
2. Fundamentals of Database Systems, Elmasri ,Navathe, Pearson Education, Fifth Edition (2008)

3. An Introduction to Database Systems, C.J.Date, a Kannan, S Swaminathan, Pearson Education, Eighth Edition (2006) (Equivalent Reading)
4. Oracle 9i, PL/SQL Programming by Scoot Urban, Oracle Press

**Suggested Additional Reading:**

1. Database Systems: Concepts, Design and Applications, S. K. Singh. Pearson Education
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)
4. Practice book on SQL and PL/SQL by Anjali, Amisha, Roopal and Nirav publications.
5. SQL, PL/SQL – The programming Language Oracle-by Ivan Bayross
6. Database management Systems, Leon and Leon, Vikas Publication

**Chapter wise Coverage from the Main book(s):**

Book No. 1: Chapter 1, 6, 7, 11(11.8)

Book No. 2: Chapter 10, 11

**Accomplishments of the student after completing the course:**

Effective user or a DBMS Professional. A student would be able to effectively squeeze the “real world” data into the relational data model of the database system and would be able to retrieve the data afterwards, Designing, Stored procedures, utilization of triggers/cursors to control and retrieve data efficiently