GUJARAT TECHNOLOGICAL UNIVERSITY
B.E   Semester: 3
Information Technology

Subject Code   130703
Subject Name   DATABASE MANAGEMENT SYSTEM

Sr.No	Course content
1.	Introductory concepts of DBMS : Introduction and applications of DBMS, Purpose of data base, Data Independence, Database System architecture- levels, Mappings, Database users and DBA
2.	Relational Model : Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries
3.	Entity-Relationship model : Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema
4.	Relational Database design : Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1Nf, 2NF, 3NF, Decomposition using FD- dependency preservation, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF
5.	Query Processing & Query Optimization : Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views
6.	Transaction Management : Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Log-based recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking
7.	Security: Introduction, Discretionary access control, Mandatory Access Control, Data Encryption

8.	SQL Concepts : Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, join, Exist, Any, All , view and its types., transaction control commands.
9.	PL/SQL Concepts : Cursors, Stored Procedures, Stored Function, Database Triggers

Reference Books:

1. An introduction to Database Systems, C J Date, Addition-Wesley.
2. Database System Concepts, Abraham Silberschatz, Henry F. Korth & S. Sudarshan, McGraw Hill.
3. Understanding SQL by Martin Gruber, BPB
4. SQL- PL/SQL by Ivan bayross
5. Oracle – The complete reference – TMH /oracle press