GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Science (Integrated-Information Technology)

Semester: II

Subject Name: Database Management System

Subject Code: 1320502

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE(E)	PA (M)	PA (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Teaching Hours	Module Weightage (%)
1	**Basics of Database system and architecture** Introduction of DBMS, Three levels ANSI SPARC database system, Three levels ANSI SPARC database system, Client-Server Architecture, Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).	03	07
2	**Relational and other models** Entity-relationship model Network model, relational and object oriented data models Integrity constraints Data manipulation operations.	05	12
3	**Relational query languages** Relational algebra, Tuple and domain relational calculus SQL3, DDL and DML constructs, Open source and Commercial DBMS, MYSQL, ORACLE, DB2, SQL server.	05	10
4	**Relational database design** Domain and data dependency Armstrong's axioms Normal forms Dependency preservation	05	12
5	**Query processing and optimization** Evaluation of relational algebra expressions Query equivalence Join strategies Query optimization Algorithms	05	12
6	**Storage strategies** Indices B-trees Hashing	03	07
7	**Transaction processing** Concurrency control, ACID property Serializability of scheduling	05	12

	Locking and timestamp based schedulers, Database recovery.		
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 function Set operations, sub-queries, correlated sub-queries Join, Exist, Any, Al View and its types. Transaction control commands.	**09**	**18**
9	**PL/SQL Concepts** Cursors Stored Procedures Stored Function Database Triggers	**04**	**10**

Reference Books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. "Fundamentals of Database Systems", 7th Edition by R. Elmasri and S. Navathe, Pearson
3. "An introduction to Database Systems", C J Date, Pearson.
4. "Modern Database Management", Hoffer , Ramesh, Topi, Pearson.
5. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press

Course Outcome:

1. Recognize the various elements of Database Management Systems
2. Given a problem statement, identify the entities and their relations and draw an E-R diagram and design database applying normalization
3. Solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL
4. Apply and relate the concepts of transaction, concurrency control, recovery and security in database
5. Recognize the purpose of query processing, optimization and demonstrate the SQL query evaluation.