



GUJARAT TECHNOLOGICAL UNIVERSITY
Master of Science (Integrated-Computer Science)
Semester: II
Subject Name: Database Management System
Subject Code: 1320302

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				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	05	12



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	Serializability of scheduling 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.