



Program	Bachelor of Technology (B.Tech)	Semester - 3
Type of Course	-	
Prerequisite		
Course Objective	-	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE TH	IAT	SEE P	CCE	
3	0	2	4	70	-	50	-	170

SEE - Semester End Examination, IAT - Internal Assessment Test, CCE - Continues & Comprehensive Evaluation

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	<p>Introduction of Database Concepts:</p> <p>Basic Concepts of Data, Database and DBMS, Applications of Databases, Advantages of DBMS over File Processing System, Three Level Architecture of Database System, Database Schema and Instance Data Abstraction and Data Independence, Database Languages, Database Users, Database Administrator and its roles, Overall System structure.</p>	5	10
2	<p>Entity Relationship Model and Relational Model:</p> <p>The Entity-Relationship (ER) Model: Entity with its types of attributes with its types, relationships with its types. real life examples of ER diagram.</p> <p>Extended ER Model (EER): Concept of specialization, generalization and aggregation, mapping of ER and EER to relational model.</p> <p>Relational Model: Structure of Relational Databases, Keys with its Types, Relational Algebra Operations and tuple relational calculus</p>	9	20
3	<p>Introduction to Structured Query Language (SQL) and PL:</p> <p>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.</p>	9	20
4	<p>PL/SQL concepts and Integrity, Security and Authorization:</p> <p>Cursors, Stored Procedures, Stored Function, Database Triggers, Introduction, Discretionary access control, Mandatory Access Control, Data Encryption.</p>	4	10
5	<p>Relational Database Design and Query Processing:</p> <p>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, Multivalued dependency, 4NF, Join dependency and 5NF.</p> <p>Query Processing: Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions.</p>	9	20
6	<p>Transaction Management:</p>	9	20



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	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.		
Total		45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	60	20	0	0	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
C01	Understand the fundamental concepts of Database Management Systems.
C02	Understand how to design ER and EER models for solving real-life problems
C03	Apply Structured Query Language (SQL) queries on given data to retrieve meaningful information.
C04	Apply advanced SQL queries on given data to retrieve meaning insights by using security and integrity aspects.
C05	Understand the principles of relational database design using normalization techniques and to optimize query processing by analyzing query cost.
C06	Understand the concepts of transaction, concurrency, and recovery.

CO PO Mapping						
CO	CO - 1	CO - 2	CO - 3	CO - 4	CO - 5	CO - 6
PO - 1						
PO - 2						
PO - 3						
PO - 4						
PO - 5						
PO - 6						
PO - 7						
PO - 8						
PO - 9						
PO - 10						
PO - 11						

**CO PSO Mapping**

CO	CO - 1	CO - 2	CO - 3	CO - 4	CO - 5	CO - 6
PSO - 1	-	-	-	-	-	-
PSO - 2	-	-	-	-	-	-
PSO - 3	-	-	-	-	-	-

Reference Books

1.	Database System Concepts (TextBook) By Abraham Silberschatz, Henry F. Korth, S. Sudarshan McGraw-Hill 6
2.	SQL- PL/SQL by Ivan bayross. (TextBook)
3.	An introduction to Database Systems, C J Date, Addition-Wesley.
4.	Understanding SQL By Edwin Elton & Martin Gruber BPB
5.	Oracle – The complete reference – TMH /oracle press.

List of Practical

1.	Consider any one case study and execute DDL and DML queries.
2.	Implement integrity constraints with given tables and insert given values as per the given case study.
3.	Perform the queries using the given predicates as follows: LIKE, BETWEEN, IN etc.
4.	Execute various data manipulation commands, aggregate functions and sorting on all the created tables.
5.	Execute single row functions of SQL.
6.	Perform the join operations on the created table.
7.	Execute aggregation of data using GROUP function.
8.	Solve the queries using the concept of sub-queries.
9.	Apply the concept of security and privileges on any real time database table.
10.	Perform the study of transaction control commands.
11.	Execute the PL/SQL block that demonstrates the use of cursor.
12.	Execute the PL/SQL block that demonstrates the use of trigger.