Program	Bachelor of Technology (BTech)	**Semester - 3**
Type of Course	-	
Prerequisite		
Course Objective	-	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		
Lecture	**Tutorial**	**Practical**	**Credit**	**SEE (T)**	**CIA (T)**	**SEE (P)**	**CIA (P)**	**Total Marks**
3	-	4	5	100	60	-	50	210

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Database system architecture** Introduction to DBMS- Historical perspective, File Versus a DBMS, Advantages of DBMS, Describing and storing data in DBMS, Architecture of a DBMS Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).	5	10
2	**Data models** Entity-relationship model, Features of ER Model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.	6	15
3	**Relational query languages** Relational algebra, Tuple and domain relational calculus and SQL – Queries, Constraints, Form of SQL Query , UNION, INERSECT and EXCEPT, Nested Queries, Aggregate Operators, Null values, Complex Integrity constraints in SQL, triggers and Embedded SQL	4	10
4	**Relational database design** Domain and data dependency, Armstrong's axioms, Normal forms-1NF, 2NF, 3NF and BCN. Dependency preservation, Lossless design.	5	15
5	**Query Processing & Query Optimization** Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.	6	10
6	**Transaction processing** Concurrency control, ACID property, Serializability of scheduling, Locking and time stamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery. Security and Authorization- Access control, Direct access control and Mandatory access control, Role of DBA, Application development.	6	15
7	**SQL Concepts**	13	25

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	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. PL/SQL Concepts : Cursors, Stored Procedures, Stored Function, Database Triggers		
8	**-**		
9	**--**		
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate
Weightage	20	20	30	15	15

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:	
CO1	Understand functional components of the DBMS.
CO2	Design queries using Relational Algebra, Relational Calculus and SQL
CO3	Apply SQL to find solutions to a broad range of queries
CO4	Implementing the SQL Concepts
CO5	Develop Data Models

Reference Books

1. **An introduction to Database Systems**
By C J Date | Pearson
2. **Database System Concepts**
By Abraham Silberschatz, Henry F. Korth, S. Sudarshan | McGraw-Hill
3. **SQL- PL/SQL**
By Ivan bayross

List of Practical

1.	To study DDL-create and DML-insert commands.
2.	Create the below-given table below and insert the data accordingly. Perform the following queries.
3.	To perform various data manipulation commands, aggregate functions and sorting concept on all created tables.
4.	To study Single-row functions.
5.	Displaying data from Multiple Tables (join)
6.	To apply the concept of Aggregating Data using Group functions.
7.	To solve queries using the concept of sub query.
8.	Manipulating Data
9.	To apply the concept of security and privileges.
10.	To study transaction control commands.
11.	Write cursors and triggers.

List of Tutorial

1.	ONLINE RETAIL APPLICATION DATABASE PROJECT
2.	COLLEGE DATABASE
3.	HOSPITAL MANAGEMENT SYSTEM
4.	LIBRARY MANAGEMENT SYSTEM
5.	RESTAURANT MANAGEMENT