

Part A: Introduction

Program: Certificate Course		Class: B.Sc.-IT VI Semester	Year: 2024	Session:2024-25
1	Course Code	ITSC-6T		
2	Course Title	Relational Database Management System		
3	Course Type	Discipline Specific Course (DSC)		
4	Pre-requisite(if any)	As per Govt. Norms / Institutional Scheme		
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Learn about Database Concepts, Architecture, various user, Data models and Data Management. • Familiar with RDBMS Software like Oracle and MySql. • Create various Tables and Databases • Explore various SQL commands. • Create Database on the basis of E-R diagrams for Minor and Major Project. 		
6	Credit Values	04 (03Theory + 01 Practical)		
7	Total Marks	Max. Marks: 100 = 80Theory + 20 Internal Assessment	Min Passing Marks: 40	

Part B: Content of the Course**Total number of Teaching-Learning – Hours-45**

Unit	Topics (Course Contents)	Hours
I	Overview of Database Management System: Introduction, Data Processing versus Data Management, Data Models: Network Model, Relational Model, Hierarchical Model, Instance and schema, View of Database system, File Oriented Approach, Database Oriented Approach, Data Independence, DBMS Architecture, Different kinds of DBMS users, Introduction to Data Dictionary. Database Administration Roles, Database languages: DDL, DML, DCL, TCL, Structured Query Language (SQL): Basic data types, commands : Create, Insert, Delete, Update, Select, Alter, Truncate, Drop, Grant, Revoke, commit and Rollback, Aggregate Function. Set operations, Join operations	12
II	Database Design and E-R Model: Database Design and E-R Model: Introduction, Entity, Strong and weak entities, Relationship, Cardinality, Attributes, Concept of keys: Super key, Candidate Primary key, Alternate key, Foreign key, ER Diagram, Constraints in Database, Cord's Rules, Extended ER features: Generalization, Specialization and Aggregation, Participation, Converting an E-R model into relational Schema.	11
III	Relational Database Design and Operations: Introduction, Pitfalls in Database Design, Dependencies: Functional Dependencies, Multivalve Dependencies, Join Dependencies, Database anomalies, Decomposition, Normalization: Normal forms 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, De normalization Relational Algebra: Select operation, Project operation, Cartesian Product operation, Union operation, Intersection operation, Minus operation, Join operation, Different types of joins (Inner join, Outer join, Self join)	11
IV	Transaction: Introduction, Desirable properties of transaction (ACID), Concurrency control techniques. Transaction support in SQL, Locking Techniques. Database recovery techniques - Shadow paging, Log Based Recovery, recovery algorithm, Database Security, Deadlock: Detection, Avoidance and Recovery.	11