Program : **Diploma in Computer Engineering / Cyber Forensics and Information Security / Robotics Process Automation**	
Course Code : **3133**	Course Title: **Database Management Systems**
Semester : **3**	Credits: **3**
Course Category: **Program Core**	
Periods per week: **3 (L:3 T:0 P:0)**	Periods per semester: **45**

Course Objectives:

- Impart the basic concepts of Database Management Systems.
- Enable students to construct relational database design using ER Model.
- Provide a solid technical overview of SQL.
- Familiarise good database design concepts.
- Give an idea on the requirement of concurrency control.

Course Prerequisites:

Topic	Course code	Course name	Semester
Computer Fundamentals		Introduction to IT systems Lab	I
Programming concepts		Problem Solving & Programming	II

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Describe Database Architecture and Data Models.	10	Applying
CO2	Use Structured Query Language for building and manipulating databases.	11	Applying
CO3	Illustrate the Relational Database Design using ER Model	11	Applying
CO4	Illustrate Normalization techniques and use of Transaction Processing.	11	Applying

	Series Test	2	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3	3	3				
CO4	3	3	3				

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Name of the Experiment	Duration (Hours)	Cognitive Level
CO1	**Illustrate the concepts of Relational Database Model and Structured Query Language.**		
M1.01	Outline the concept of database and database management system.	3	Understanding
M1.02	Explain Database Architecture and Languages.	3	Understanding
M1.03	Illustrate Basic Relational Model Concepts	4	Applying
Contents: **Introduction to Databases:** Data - Database - DBMS, Characteristics of Database System, Applications of Database, Different type of individuals interact with databases, Data Models, Database Schema - Instance - Database state, Three Schema Architecture and Data Independence, Database Languages, Database Interfaces, DBMS Component Modules, Centralised and Client/Server Architecture, Classification of DBMS. **Relational Model Concepts:** Domain, Attributes, Tuples and Relations, Characteristics of Relations, Relational Model Constraints and Relational Database Schemas, Update Operations and Dealing with Constraint Violations.			
CO2	**Use Structured Query Language for building and manipulating databases.**		
M2.01	Illustrate the basic features of SQL	5	Applying
M2.02	Illustrate the advanced features of SQL	6	Applying
	Series Test – I	1	
Contents: **SQL:** Data Definition and Data Types, Specifying Constraints, Basic Retrieval Queries,			

Insert, Delete and Update Statements.

Advanced Features of SQL: Complex SQL Retrieval Queries, Assertions, Triggers, Views, Schema change statements.

CO3	**Illustrate the Relational Database Design using ER Model.**		
M3.01	Explain the use of High level Conceptual Data Model for Database Design	1	Understanding
M3.02	Explain Entity Relationship Model.	3	Understanding
M3.03	Explain Enhanced ER Model.	1	Remembering.
M3.04	Illustrate mapping of Conceptual Design into Logic Design.	2	Applying
M3.05	Design ER Models for real world applications.	4	Applying

Contents:

Conceptual Modelling: High level Conceptual Data Model for Database Design, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship sets, Roles, Structural Constraints, Weak Entity Types, ER Diagrams, Naming Conventions Relationship Types of Degree higher than Two. Design ER model for Real applications.

Enhanced ER model :Specialization, Generalisation, Aggression

Relational Database Design: ER model to Relational Model Mapping

CO4	**Illustrate Normalization techniques and use of Transaction Processing.**		
M4.01	Explain design guidelines for relation schema and Functional Dependency	1	Understanding
M4.02	Illustrate normalization forms - 1NF - 2NF - 3NF - BCNF - 4NF	4	Applying
M4.03	Explain the need of Concurrency Control	2	Understanding
M4.04	Explain the desirable properties of Transaction	1	Understanding
M4.05	Outline the features, advantages, components and requirements of mobile databases	3	Understanding
	Series Test – II	1	

Contents:

Transaction Processing: Introduction to Transaction Processing, Concurrency Control, Recovery, Transaction and System Concepts, Desirable Properties of Transactions.

Mobile databases: Introduction to Mobile databases-advantages-components-Requirements

Text / Reference

T/R	Book Title/Author
T1	Elmasri, Navathe, **Fundamentals of Database Systems**, Pearson,6th Ed.
R1	Silberschatz, Korth, and Sudarshan, **Database system concepts** ,McGrawHill, 6th Ed.
R2	Bayross, Ivan BPB, **SQL/ PL/SQL**,New Delhi

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106106093/
2	https://www.w3schools.com/sql
3	https://www.tutorialspoint.com/sql
4	https://www.javatpoint.com/sql