Department: Computer Science and Engineering	
Course Title: Database Laboratory	***Course Code: CS57L***
Credits(L:T:P): 0:0:1.5	***Core/Elective: Core***
Type of Course: Practical	***Total Lecture Hours: 42***
CIE Marks: 50	

Pre-requisite: Data structures and algorithms

Course Outcomes: After completion of the course, students are able to:

CO1:	Design and populate the database based on problem type.
CO2:	Demonstrate data manipulation operations for a database schema with integrity and key constraints.
CO3:	Analyze the normalization level given any schema design.
CO4:	Efficient retrieval and manipulation of database through procedures and functions.
CO5:	Select techniques and tools to design and implement a database suitable for any organization.

Unit No.	Course Content	No.of Hours
1.	**Data Definition Language (DDL) commands in RDBMS** i. Design and implement record insertion, deletion, search, update operation using file based approach. ii. Consider the database schemas given below. The primary keys are underlined and the data types are specified. Create and insert tuples for each database satisfying the defined constraints. **A. Insurance database** **PERSON** (driver id#: string, name: string, address: string) **CAR** (regno: string, model: string, year: int) **ACCIDENT** (report_ number: int, acc_date: date, location: string) **OWNS** (driver id#: string, regno: string) **PARTICIPATED**(driver id#:string, regno:string, report_ number: int, damage_amount: int) **B. Order processing database** **Customer** (Cust#: int, cname: string, city: string) **Order** (order#: int, odate: date, cust#: int, order-amt: int) **Order-item** (order#: int, Item#: int, qty: int)	08

	Item (item#: int, unitprice: int) **Shipment** (order#: int, warehouse#: int, ship-date: date) **Warehouse** (warehouse#:int, city: string) **C. Student enrollment in courses and books adopted for each course** **STUDENT** (regno: string, name: string, major: string, bdate: date) **COURSE** (course#: int, cname: string, dept: string) **ENROLL**(regno:string, course#: int,sem: int,marks: int) **BOOK-ADOPTION** (course#: int, sem: int, book-ISBN: int) **TEXT** (book-ISBN: int, book-title: string, publisher: string,author: string)	
2.	**Data Manipulation Language (DML) and Data Control Language (DCL)** Write valid DML statements to retrieve tuples from the unit 1 databases. The query may contain appropriate DML and DCL commands such as: i. Select with – %like, between, where clause – Group by – Group by having – Order by – Set Operations – Exists and not exists – Aggregate functions – Join operations ii. Grant and revoke permission	08
3.	**Design of tables by normalization and dependency analysis** Normalize all the unit 1 databases by considering the database schemas, primary keys and dependency.	08
4.	**Procedures and Functions** i. Views: creation and manipulating content. ii. Procedures: creation and execution of database procedures that accepts input parameters and processes the records based on the input parameter. iii. Functions: Practice declaring, defining and invoking a function that computes and returns the maximum, minimum, average of values. iv. Triggers: creation and execution of database triggers on every insert, delete and update operation.	08
5.	**Case study** The students have to select and implement one database case study from day to day situations using SQL/MySQL on Windows/LINUX operating System.	10

Text Books:

1. Elmasri and Navathe: Fundamentals of Database Systems, 7th Edition, Pearson Education, 2016.
2. Raghu Ramakrishnan and Johannes Gehrke: Database Management Systems, 3rd Edition, McGraw-Hill, 2015.

Reference Books:

1. Silberschatz, Korth and Sudharshan: Data base System Concepts, 6th Edition, Mc-GrawHill, 2016.
2. C.J. Date, A. Kannan, S. Swamynatham: An Introduction to Database Systems, 8th Edition, Pearson Education, 2016.

Web Resources:

1. http://nptel.ac.in/courses/106106093/
2. https://nptel.ac.in/courses/106/104/106104135/