Course Type	Course Code	Name of Course	L	T	P	Credit
DP	**NMCC525**	Database Management Systems Lab	0	0	3	1.5

Course Objective
● The course will provide an understanding of data storage, manipulation and retrieval of data. ● The objective of course is to provide fundamentals of DBMS to enable students with Query optimization through DBMS (using Structured Query Language) and to learn about Database implementation.
Learning Outcomes
Upon successful completion of this course, students will: • have a broad understanding of database concepts and database management system software and Structured Query Language (SQL). • be able to model an application's data requirements and to design database schemas based on the conceptual model. • be able to write SQL commands to create tables, triggers and indexes, insert/update/delete data, and query data in a relational DBMS.

Lab No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Introduction to MySQL. Logical and physical schema of Database. Data independence	3	Knowledge of MySQL software.
2	DDL and DML Commands with Examples. Database creation, Table creation, constraints.	3	Students will learn how to create database and tables.
3	Data insertion, update/modification/ Delete and retrieval through MySQL. Basic SQL structure. Query implementation.	3	This will help students to learn how to implement basic queries in Database through MySQL.

4	Enforcing integrity constraints (Domain, Key constraints (Primary/Foreign keys), NOT NULL, UNIQUE, DEFAULT, Check).	3	This topic will help the students to understand different integrity constraints and how to implement them in MySQL.
5	Creating and updating View. Query implementation using View.	3	Students will learn about the concept of view through MySQL.
6	Use of aggregate functions (AVG, COUNT, MIN, MAX, SUM)	3	It provides understanding and use of different aggregate functions through MySQL.
7	Use of Join operator (Natural join, Outer join (left, right and full)	3	This topic will help the students to use different Join operators.
8	Query optimization through Nested Query (Use of logical connectives, set comparison operators, Union, Intersect, Except, Exists clauses)	3	Students will get the idea of optimization of MySQL queries through nested query structure.
9	Use of Group By and Having clause,	3	This will enable students to use Group by, Having clause
10	Trigger in MySQL	3	Students will learn to enforce Trigger in MySQL
11	Index creation in SQL.	3	Students will learn how to create index through MySQL.
12	Introduction to PL/ SQL (functions of PL/SQL)	3	Knowledge of PL/SQL and its functions
13	Lab practice	3	Will enable students to revisit some experiments and will strengthen their practical skill.
14	Practice and review	3	Practice session
Total		**42**	

Text Book:

1. Silberschatz, H.F. Korth and S. Sudarshan, Database System Concepts, 5th Edition, McGraw Hill. (2006).

Reference Books:

1. Elmasri and Navathe. Fundamentals of Database Systems. 7th Edition, Pearson Education. (2017).
2. Peter Rob, Steven Morris and Carlos Coronel. Database Systems Design, Implementation and Management. Thomson Learning, 9th Edition. (2011).