Course Type	Course Code	Name of Course	L	T	P	Credit
DC	**NMCC523**	Data Base Management Systems	3	1	0	4

Course Objective

- To introduce the concepts of Database implementation, understanding of file management and Query optimization and to impart an understanding of data storage, manipulation and retrieval.

Learning Outcomes

- Upon successful completion of this course, students will be enabled with Database management skill and they will understand the basic operations and role of Database Administrator.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Introduction to DBMS, Advantages, Database applications, purpose, accessing and modifying databases, architecture - users and administrators.	6L+3T	On successful covering these contents students will be introduced to DBMS with its advantages and architectural aspects.
2	Data Modelling, Database concepts, E-R data model, network and hierarchical data models, Relational Model (database schema, keys, integrity constraints)	9L+3T	These content will establish the understanding of the steps to prepare a data model, fundamentals of relational data model its structure, designing and advantages.
3	Query Languages, Relational Algebra (Fundamental and derived operators), Relational calculus (tuple and domain calculus), SQL (Basic SQL structure, view, Referential integrity, join, set operations, nested queries, aggregation, database modification, triggers) query optimization using SQL	10L+3T	These content will enable the learner to express queries using relational algebra, relational calculus and SQL.
4	Functional dependency, Relational Database Design (Decomposition, Normalization, Transactions)	7L+3T	These content will help learner to understand the architecture of Relational database which will further help in efficient management & outcomes.
5	Storage media and storage structure, file organization. Indexing (concepts, clustered and non-clustered indices), Heap file, indexed file, B+ tree file, file with variable length records, performance and evaluation. Introduction to different types of NoSQL databases: MongoDB and Neo4j.	10L+2T	After successful coverage of these contents learner will be able to understand the organization of files for keeping databases and how to optimize the data base queries for fast response
Total		42L+14T	

Text Books

1. A. Silberschatz, H.F. Korth and S. Sudarshan, Database System Concepts, 6th Edition, McGraw Hill, 2013.
2. R. Elmasri and S. B. Navathe, "Fundamentals of Database Systems", 5th Edition, PEARSON Education, 2007.

Reference Books

1. R. Ramakrishnan and J. Gehrke, Database Management Systems, 3rd Edition, McGraw Hill, 2003.
2. C.J. Date, A. Kannan and S. Swamynathan, An Introduction to Database Systems, 8th Edition, PEARSON Education, 2006.