Advanced DBMS

Course Type	Course Code	Name of the Course	L	T	P	Credit
DC	NMSC_525	Advanced DBMS	3	0	0	3

Course Objective
The course introduces the management of database systems. The course emphasizes the understanding of the relational systems including data models, database architectures, and database manipulations. The course also provides an understanding of new developments and trends such as Internet database environment and data warehousing.

Learning Outcome
At the end of the course, the student will be able to: Understand terms related to database design and management Understand the objectives of data and information management Construct conceptual data models Implement relational databases using a RDBMS Retrieve data using SQL Understand the basics of data management and administration Understand the basics of data warehousing.

Unit No	Topics to be covered	Lecture hours	Learning Outcomes
1	**Object oriented model:** Nested relations, modelling nested relations as object model, extension of SQL, object definition and query language (ODL, OQL), object relational database model, storage and access methods. Active databases, Advanced trigger structures, SQL extensions.	8	At the end of this unit, students will be able to write complex data queries in SQL on relational database models, set triggers, and learn about data storage and access methods.
2	**Security and Integrity:** Discretionary and mandatory access control; Facilities in SQL, access control models for RDBMS and OODBMS. Distributed Database: Basic Structure, fragmentation algorithms, trade-offs for replication, query processing, recovery and concurrency control; multi-database systems; Design of Web Databases.	10	At the end of this unit, students will be able to write their first web application based on a distributed database.
3	**Data Mining and Warehousing:** Association Rule algorithms, algorithms for sequential patterns; Clustering and classification in data mining; Basic structure of a data warehouse; Extension of ER Model, materialistic view creation.	8	At the end of this unit, students will be able store and access data from various database storage systems and mine ana analyse databases for making business decisions.

4	**Online analytical processing and data cube.** Deductive databases, recursive 4 query construction, logical database design and data log.	8	At the end of this unit, students will be able design deductive and logical databases and write recursive queries.
5	**Advanced application development:** Performance tuning, Database application testing and standardization, Spatial and Temporal database, Multimedia database, and Advanced transaction processing.	8	At the end of this unit, students will gain in-depth understanding on the advanced topics in DBMS.
	TOTAL	42	

Textbooks

1. Korth, Silberschatz and Sudarshan. Database System Concepts, McGraw Hill, 6th Edition, 2011.

Reference books

1. P. O'Neil, Morgan Koffman. Database: Principles, Programming, Performance, 3rd Edition, 1997.

2. J. D. Ullman. Principles of Database and Knowledgebase Systems, Computer Science Press, 1988.