

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	CSC502	Advanced DBMS	3	0	0	9
	NCSC507	Advanced DBMS	3	1	0	

Course Objective

This course is intended to provide the students with an understanding of the current theory and practice of database management systems. To help the students more fully appreciate their nature, the course provides a solid technical overview of database management systems, using a current database product as a case study.

Learning Outcomes

Students will be learning advanced database management strategies which will help them in campus placement and research work.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Relational Databases: Integrity Constraints, Functional Dependency, Multi-valued Dependency	3	Understanding of the fundamentals of Relational databases
2	Query Processing and Optimization: Evaluation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Data access from disk, Index based access, Sort and Join Processing, Physical plan selection, Limitations of Relational Data Model;	8	To understand query processing enhancement techniques using indexing on relational models.
3	Parallel and Distributed Databases: Distributed Data Storage, Fragmentation & Replication, Location and Fragment Transparency	7	To understand fundamental knowledge about fragmentation and replication on various locations.
4	Distributed Query Processing and Optimization, Distributed Transaction Modeling and Concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation.	6	Understanding the concept of distributed query processing and concurrency models
5	Advanced Transaction Processing: Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Workflows, Transaction Processing Monitors	7	To understand basic and advanced level of transaction processing mechanisms with various workflows.
6	Object Oriented and Object Relational DBs: Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases;	7	Understanding different type of relational databases and their need with required modalities.
7	NoSQL databases: Cassandra, MongoDB, etc.,	4	To understand the advanced level of cloud databases for practical importance

Textbooks:

1. Avi Silberschatz, Henry F. Korth & S. Sudarshan, “**Database System Concepts**”, Tata Mc-Graw-Hill.

Reference Books:

1. W. Kim, “**Modern Database Systems**”, Addison Wesley.
2. W. Kim, “**Introduction to Object Oriented Databases**”, MIT Press.
3. J. D. Ullman, “**Principles of Database and Knowledge Base Systems**”, Computer Science Press.