

Course Type	Course Code	Name of Course	L	T	P	Credit
DC8	CSC301	Database Management Systems	3	0	0	9

Course Objective

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Learning Outcomes

Upon successful completion of this course, students will:

- have a broad understanding of database concepts and database management system software.
- have a high-level understanding of major DBMS components and their function.
- be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
- be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction: Introduction and Overview of a DBMS – Purpose of Database Systems, View of Data, Data Models, DDL, DML, Transaction Management, Storage Management, Database Administrator, Database Users, Overall System Structure.	5	Understanding of DBMS and what it provides. You know when to use files and when to use a DBMS. It provides idea of DBMS Architecture.
2	Entity-Relationship Model: Basic Concepts, Design Issues, Mapping Constraints, Keys, ER-Diagram, Weak Entity Sets, Extended ER-Diagram, Reduction of ER-Schema to Tables Relational Model.	5	This unit will help students in understanding the steps to prepare a data model based on user requirements.
3	Concepts: Structure of Relational Databases, Relational Algebra, Tuple Relational Calculus, Domain Relational Calculus, Extended Relational-Algebra Operations, Modification of the Database, Views.	6	This will help is designing the relation model, which will conceptualize data using the relational model. You can also express queries using relational algebra.
4	Structured Query Language	5	You can express queries using SQL.
5	Integrity Constraints: Domain Constraints, Referential Integrity, Assertions, Triggers, Functional Dependencies.	5	To understand what constraints and triggers are for and how to use them.
6	Relational Database Design: Decomposition, Normalization, Transactions.	4	This will help student in further refining the relational database for efficient management & outcome.
7	Concurrency Control: Transaction Concepts, Transaction State, Concurrent Executions, Serializability, Recoverability, Lock-Based Protocols, Timestamp-Based Protocols, Deadlock Handling Basics of Database.	5	To know all about the transactions and handling concurrent transactions in databases.
8	File Organization & Query Processing: File Organization, Organization of Records in Files, Data Dictionary Storage, Steps in Query Processing.	3	Help in understanding the organization of files for keeping databases and how to optimize the database queries for fast response.

Text Books:

1. Korth, Sliberchatz, Sudarshan, : "Database System Concepts", 6th Edition, McGraw –Hill

Reference Books:

1. Elmasri and Navathe, "Fundamentals of Database Systems", 5th Edition, PEARSON Education.
2. Peter Rob and Carlos Coronel, "Database Systems Design, Implementation and Management", Thomson Learning, 5th Edition.
3. Raghu Ramkrishnan and Johannes Gehrke, "Database Management Systems", TMH.