Database Management Systems	3	0	2	Data structures

Course Objective: 1. To understand the concepts of database management system and its applications, data modeling, database design, and query languages.
 2. To understand different files structures, transaction management, concurrency control, database recovery, query processing and optimization

S. NO	Course Outcomes (CO)
CO1	Ability to apply different data modeling methods in requirement analysis, design, and implementation of database system.
CO2	Ability to apply the normal forms for efficient designing of relational database.
CO3	Ability to use appropriate storage and access structures .
CO4	Ability to use techniques for transaction management, concurrency control, and recovery.
CO5	Ability to analyze complexity issues of query execution

S. NO	Contents	Contact Hours
UNIT 1	Introduction: Database system concepts and its architecture, Data models schema and instances, Data independence and database language and interface, Data definition languages, DML. Overall database structure.Data modeling using Entity Relationship Model: E.R. model concept, notation for ER diagrams mapping constraints, Keys, concept of super key, candidate key, primary key generalizations, Aggregation, reducing ER diagrams to tables, extended ER model.	9
UNIT 2	Relational Data Model and Language: Relational data model concepts, integrity constraints, Keys domain constraints, referential integrity, assertions, triggers, foreign key relational algebra, relational calculus, domain and tuple calculus, SQL data definition queries and updates in SQL.	9
UNIT 3	Data Base Design: Functional dependencies, normal forms, 1NF, 2NF, 3NF and BCNF, multi-valued dependencies fourth normal form, join dependencies and fifth normal form. Inclusion dependencies, lossless join decompositions, normalization using FD, MVD and JDs, alternatives approaches to database design	8
UNIT 4	File Organization, Indexing and Hashing Overview of file organization techniques, Indexing and Hashing- Basic concepts, Static Hashing, Dynamic Hashing, Ordered indices, Multi-level indexes, B-Tree index files, B+- Tree index files, Buffer management Transaction processing concepts: Transaction processing system, schedule and recoverability, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recovery from transaction failures, deadlock handling.	8
UNIT 5	Concurrency Control Techniques: Locking Techniques for concurrency control, time stamping protocols for concurrency control, concurrency control in distributed systems. multiple granularities and multi-version schemes.	8
	TOTAL	42