

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
REFERENCES						
S.No.		Name of Books/Authors/Publishers				Year of Publication / Reprint
1		Elmasri, Navathe, ”Fundamentals of Database systems”, Addison Wesley				2019

2	Korth, Silbertz, Sudarshan,"Data base concepts", McGraw-Hill.	2021
3	Ramakrishna, Gehkre, "Database Management System", McGraw-Hill	2002
4	Date C.J.,"An Introduction to Database systems"	2006

B.Tech. Information Technology						
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Course code: Course Title	Course Structure			Pre-Requisite
	L	T	P	Probability, Statistics