

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-402	Relational Database Management System	PCC	4	3	1	0	50	100	150

Course Outcomes:

At the end of the course the student will be able to	
CO1	Identify the basic concepts, architecture and various data models used in Database Management Systems.
CO2	Identify basic database storage structures and access techniques such as file organizations, indexing methods.
CO3	Design queries using Structured Query Language (SQL) for database definition and database manipulation.
CO4	Apply the use of normalization and functional dependencies in DBMS.
CO5	Implement the concept of transaction, concurrency control and recovery in DBMS

Detailed Syllabus**Section-A**

Unit 1: Basic Concepts: Introduction, characteristics, history and applications, Components of DBMS, Advantages and Disadvantages of DBMS. Language and Architecture: Data Modeling, Records and Files, Abstraction and data Integration, Views, Data Independence, Data Associations, Data Models Classification. **(8 Hrs.)**

Unit 2: Entity Relationship Model- Basic concepts, constraints, design issues, Entity Relationship diagram, Weak Entity sets, Extended ER features, Design of ER database schema, Reduction of ER schema to tables. Relational Model- Attributes and domains, Tuples, Relations and Schemas, Relation representation, keys, Integrity Rules, Relational algebra, Relational Calculus, Data Manipulation using SQL. **(12 Hrs.)**

Unit 3: Relational Database Design: Normalization using Functional Dependency, Normalization using Join dependencies, Domain key normal form. **(8 Hrs.)**

Section-B

Unit 4: Transactions: Introduction to transaction and system concept, transaction state, desirable properties of transactions (ACID properties), Concurrent executions, Serializability, Recoverability, implementation of isolation, transaction definition in SQL. Concurrency Control: Lock based protocols, Timestamp-based protocols, Validation-based protocols, Multiple Granularity, Multi version Schemes, Deadlock Handling, Insert and Delete operations. **(12 Hrs.)**

Unit 5: Recovery Systems: Failure classification, Storage Structure, Recovery and Atomicity, Log based recovery, Shadow Paging, Recovery with Concurrent Transitions, Buffer Management. **(8 Hrs.)**

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Database System Concepts	Korth, Silberchatz	Mcgraw Hill Education	7th (2021)

Reference Book

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Fundamentals of Database System	Imasri Ramez, Navathe Shamkant	Pearson Education	7th (2017)