

Course Code	DATABASE MANAGEMENT SYSTEMS		L	T	P	C
20A05401T			3	0	0	3
	(Common to CSE, IT, CSE(DS), CSE (IoT), CSE (AI), CSE (AI & ML) and AI & DS)					
Pre-requisite	NIL	Semester	IV			
Course Objectives:						
<p>This course is designed to:</p> <ul style="list-style-type: none"> • Train in the fundamental concepts of database management systems, database modeling and design, SQL, PL/SQL and system implementation techniques. • Enable students to model ER diagrams for any customized application • Inducting appropriate strategies for optimization of queries. • Provide knowledge on concurrency techniques • Demonstrate the organization of Databases 						
Course Outcomes (CO):						
<p>After completion of the course, students will be able to</p> <ul style="list-style-type: none"> • Design a database for a real-world information system • Define transactions that preserve the integrity of the database • Generate tables for a database • Organize the data to prevent redundancy • Pose queries to retrieve the information from the database. 						
UNIT - I	Introduction, Introduction to Relational Model		9Hrs			
<p>Introduction: Database systems applications, Purpose of Database Systems, view of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database users and Administrators, Introduction to Relational Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations</p>						
UNIT - II	Introduction to SQL, Advanced SQL		9 Hrs			
<p>Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub-queries, Modification of the Database. Intermediate SQL: Joint Expressions, Views, Transactions, Integrity Constraints, SQL Data types and schemas, Authorization. Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, OLAP, Formal relational query languages.</p>						
UNIT - III	Database Design and the E-R Model, Relational Database Design		8Hrs			
<p>Database Design and the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues. Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional-Dependency Theory, Algorithms for Decomposition, Decomposition Using Multivalued Dependencies, More Normal Forms.</p>						
UNIT - IV	Query Processing, Query optimization		8 Hrs			
<p>Query Processing: Overview, Measures of Query cost, Selection operation, sorting, Join Operation, other operations, Evaluation of Expressions. Query optimization: Overview, Transformation of Relational Expressions, Estimating statistics of Expression results, Choice of Evaluation Plans, Materialized views, Advanced Topics in Query Optimization.</p>						
UNIT - V	Transaction Management, Concurrency Control, Recovery System		10Hrs			
<p>Transaction Management: Transactions: Concept, A Simple Transactional Model, Storage Structures, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements.</p>						



R 20 Regulations

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

Computer Science & Engineering

Concurrency Control: Lock-based Protocols, Deadlock Handling, Multiple granularity, Timestamp-based Protocols, and Validation-based Protocols.
Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, Early Lock Release and Logical Undo Operations.
Textbooks:
1. A.Silberschatz, H.F.Korth, S.Sudarshan, “Database System Concepts”,6/e, TMH 2019
Reference Books:
1. Database Management System, 6/e RamezElmasri, Shamkant B. Navathe, PEA
2. Database Principles Fundamentals of Design Implementation and Management, Carlos Coronel, Steven Morris, Peter Robb, Cengage Learning.
3.Database Management Systems, 3/e, Raghurama Krishnan, Johannes Gehrke,TMH
Online Learning Resources:
https://onlinecourses.nptel.ac.in/noc21_cs04/preview