



R21 Regulations

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

MASTER OF COMPUTER APPLICATIONS

Course Code	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
21F00105		4	0	0	4
Semester		I			
Course Objectives:					
<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 diagram for any customized application • Inducting appropriate strategies for optimization of queries. • Provide knowledge on concurrency techniques • Demonstrate the organization of Databases 					
Course Outcomes (CO): Student will be able to					
<ul style="list-style-type: none"> • Design a database for a real world information system • Define transactions which preserve the integrity of the database • Generate tables for a database • Organize the data to prevent redundancy • Pose queries to retrieve the information from database 					
UNIT – I					Lecture Hrs:
Introduction: Database systems applications, Purpose of Database Systems, view of Data, Database Languages, Database Design, Database Engine, Database and Application Architecture, Database Users and Administrators. Introduction to Relational Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Algebra					
UNIT – II					Lecture Hrs:
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, Index Definition in SQL, Authorization. Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, Advanced Aggregation Features.					
UNIT – III					Lecture Hrs:
Database Design and the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Complex Attributes, Mapping Cardinalities, Primary Key, Removing Redundant Attributes in Entity Sets, Reducing E-R Diagrams to Relational Schemas, Extended E-R Features, Entity-Relationship Design Issues, Alternative Notations for Modelling Data, Other Aspects of Database Design. Relational Database Design: Features of Good Relational Designs, Decomposition Using Functional Dependencies, Normal Forms, Functional-Dependency Theory, Algorithms for Decomposition using Functional Dependencies, Decomposition Using Multivalued Dependencies, More Normal Forms, Atomic Domains and First Normal Form, Database-Design Process, Modelling Temporal Data, Indexing.					
UNIT – IV					Lecture Hrs:
Query Processing: Overview, Measures of Query cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions, Query Processing in Memory. Query optimization: Overview, Transformation of Relational Expressions, Estimating Statistics of Expression Results, Choice of Evaluation Plans, Materialized views, Advanced Topics in Query Optimization.					
UNIT – V					Lecture Hrs:
Transaction Management: Transactions: Transaction Concept, A Simple Transactional Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements. Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Insert Operations, Delete Operations and Predicate Reads, Timestamp-Based Protocols, Validation- Based Protocols, Multiversion Schemes, Snapshot Isolation, Weak Levels of Consistency in Practice, Advanced Topics in Concurrency. Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Non-Volatile Storage, High Availability Using Remote Backup Systems, Early Lock Release and Logical Undo Operations, ARIES, Recovery in Main- Memory Databases.					
TEXT BOOKS:					
1. A.Silberschatz, H.F.Korth, S.Sudarshan, “Database System Concepts”, 7/e, TMH 2020					