MNG 304D

DATA BASE MANAGEMENT

Credit: 4, Class Hours: 45

Module I : Introduction : Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Design, Object Based and Semi-structured Database, Data Storage and Querying , Transaction Management, Data Mining and Analysis, Database Architecture, Database Users and Administrations, History of Database Systems

Relational Model : Structure of Relational Database, Fundamental Relational Algebra Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Null Values, Modification of the Database

SQL: Background, Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Subqueries , Complex Queries, Views, Modification of the Database, Joined Relations,

Module II : DATABASE DESIGN METHODOLOGY : Database Design and the ER Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Entity Relationship Diagrams, EntityRelationship Design Issues], Weak Entity Sets, Extended E R Features, Database Design for Banking Enterprise, Reduction to Relational Schemes, Other Aspects of Database Design , Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependency Theory ,Functional-Dependency Theory, Decomposition Using Functional Dependencies, Decomposition Using Multivalued Dependencies;

Application Design and Development: User Interfaces and Tools, Web Interfaces to Database, Web Fundamentals, Servlets and JSP, Building Large Web Applications, Triggers, Authorization in SQL, Application Security,

Module III : Integrity Issues in Database : Backup and Recovery: Overview of Integrity

Control Functions, The Processes of Database Backup and Recovery, Backup Strategies, Summary Chart of Traditional Backup and Recovery Strategies, Residual Dump Backup Strategy, Variables in the Backup Process, Process Checkpoint and Restart,

Quality Control and Concurrent Update: Data Validation, Update Authorization, Concurrent Update Control, Update Synchronization;

Access Control and Encryption: Data Access Control Policies and Approaches, A General Model of Data Access Control, User Identification and Authentication, Authorization, Controlling Inferences from Statistical Data, Encryption, Threat Monitoring and Audit Trail; Database-System Architecture: Centralized and Client-Server Architecture, Server System

Architectures, Parallel Systems, Distributed Systems, Network Types, Parallel Database: Introduction, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism , Interoperation Parallelism , Design of Parallel Systems,

Module – IV: Distributed System: Homogeneous and Heterogeneous Database, Distributed Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Database, Availability, Distributed Query Processing, Heterogeneous Distributed Database, Directory Systems .Data Analysis and Mining: Decision-Support Systems, Data Analysis and OLAP, Data Warehousing, Data Mining