WITH EFFECT FROM THE ACADEMIC YEAR 2012 - 2013

CS 301

DATABASE MANAGEMENT SYSTEMS

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 75 Marks
Sessional 25 Marks

UNIT-I

Introduction : Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Specialty Databases, Data Storage and Querying, Data Mining and Information Retrieval, Database Architecture, Database Users and Administrators.

Database Design and E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams, E-R Design Issues, Extended E-R Features, Reduction to Relation Schemas, Other Aspects of Database Design.

UNIT-II

Relational Model: Structure of Relational Databases, Database Schema, Keys, Relational Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Modification of the Database.

Structured Query Language: Overviews, Basic Structure of SQL Queries, Set Operations, Null Values, Additional Basic Operations, Aggregate Functions, Nested Sub queries, Views, Join Expression.

UNIT-III

Advanced SQL: SQL Data Types , Integrity Constraints, Authorization, Functions and Procedural Constructs, Recursive Queries , Triggers, JDBC,ODBC, Embedded SQL.

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal form, Decomposition Using Functional Dependencies, Functional Dependency Theory, Algorithm for Decomposition, Decomposition using Multivalve Dependencies.

UNIT-IV

Indexing and Hashing: Basic Concepts, Ordered Indices, B+ Tree Index Files, B Tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

Transaction Management: Transaction Concept, Storage Structure Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability , Recoverability, Transaction Isolation Levels ,Implementation of Isolation Levels.

UNIT-V

Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert or Delete Operations and Predicate Read , Concurrency in Index Structures.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Recovery Algorithms, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Suggested Reading:

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, *" Database System Concepts",* Sixth Edition, McGraw-Hill International Edition,2011
2. Date CJ, Kannan A, Swamynathan S, *"An Introduction to Database Systems",* Eight Edition, Pearson Education, 2006.
3. Raghu Ramakrishnan, Johnnes Gehrke, *"Database Management Systems" ,* Third Edition, McGraw Hill,2003.
4. Ramez Elmasri, Durvasul VLN Somayazulu, Shamkant B Navathe, Shyam K Gupta, *"Fundamentals of Database Systems",* Fourth Edition, Pearson Education,2006.
5. Peter Rob, Carlos Coronel, *"Database Systems",* Thomson, 2007.