

I Year I Semester
Code: 17CS104

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DATABASEMANAGEMENTSYSTEMS

UNIT-I:

Database System Applications, Purpose of Database Systems, View of Data–Data Abstraction, Instances and Schemas, Data Models – the ER Model, Relational Model, Other Models – Database Languages–DDL, DML, Database Access from Applications Programs, Transaction Management, Data Storage and Querying, Database Architecture, Database Users and Administrators, History of Database Systems. Introduction to Database design, ER diagrams, Beyond ERDesign, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ERModel, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. Relational Model: Introduction to the Relational Model–Integrity Constraints Over Relations, Enforcing Integrity constraints, Querying relational data, Logical database Design, Introduction to Views–Destroying /altering Tables and Views.

UNIT-II:

Relational Algebra and Calculus: Relational Algebra–Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus–Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus. Form of Basic SQL Query–Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set – Comparison Operators, Aggregate Operators, NULL values – Comparison using Null values –Logical connectives –AND, OR and NOT – Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Databases.

UNIT-III:

Introduction to Schema Refinement – Problems Caused by redundancy, Decompositions – Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms – FIRST, SECOND, THIRD Normal forms –BCNF–Properties of Decompositions–Lossless-join Decomposition, Depend encypreserving Decomposition, Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form, Join Dependencies, FIFTHN Normal form, Inclusion Dependencies.

UNIT-IV:

Overview of Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions – Lock Based Concurrency Control, Deadlocks – Performance of Locking –Transaction Support in SQL. Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions, Dealing with Dead Locks, Specialized Locking Techniques –Concurrency Control without Locking. Crash recovery: Introduction to Crash recovery, Introduction to ARIES, the Log, and Other Recovery related Structures, the Write-Ahead Log Protocol, Check pointing, recovering from a System Crash, Media recovery

UNIT-V:

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing– Clustered Indexes, Primary and Secondary Indexes, Index data Structures – Hash Based Indexing, Tree based Indexing, Comparison of File Organizations. Storing data: Disks and Files:-The Memory Hierarchy – Redundant Arrays of Independent Disks. Tree Structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM)B+ Trees: A Dynamic Index Structure, Search, Insert, Delete. Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extend blevs .Linear Hashing.

TEXTBOOKS:

1. Database Management Systems, Raghu Ramakrishna, Johannes Gehrke, TMH, 3rd Edition, 2003.
2. Database System Concepts, A.Silberschatz, H.F. Korth, S. Sudarshan, McGraw hill, VIedition, 2006.
3. Fundamentals of Database Systems 5th edition. Ramez Elmasri, Shamkat B.Navathe, Pearson Education, 2008.

REFERENCEBOOKS:

1. Database Management System Oracle SQL and PL/SQL, P.K.Das Gupta, PHI.
2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
3. Database Systems, A Practical approach to Design Implementation and Management Fourth edition, Thomas Connolly, Carolyn Begg, Pearson education.