DATABASE MANAGEMENT SYSTEMS
(Common to CSE & IT)

Course Code : 15CT1108

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Course Outcomes:

At the end of the course, a student will be able to

CO 1 Design Entity Relationship models.

CO 2 Distinguish procedural and non-procedural query languages.

CO 3 Design database schema using normalization.

CO 4 Explain lock-based, time stamping and tree-based protocols.

CO 5 Illustrate Database Recovery methods.

UNIT-I **(10 Lectures)**

History of Data base Systems. Data base System Applications, data base System vs file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL, DML — Transaction Management – data base System Structure – Storage Manager – the Query Processor.

Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT-II **(10 Lectures)**

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data

– Logical data base Design – Introduction to Views – Destroying / altering Tables and Views. Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Relational calculus –Tuple relational Calculus– Domain relational calculus

UNIT-III (8 Lectures)

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF– Schema refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form.

UNIT-IV (11 Lectures)

Transaction Concept- Simple Transaction Model-Storage Structure-Transaction State- Implementation of Atomicity and Durability, Isolation– Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation-Transactions as SQL Statements.

Concurrency Control: Lock – Based Protocols-Dead lock Handling– Timestamp Based Protocols- Validation- Based Protocols-Multi version schemes-insert, delete and predicate operations– Multiple Granularity.

UNIT-V (11 Lectures)

Recovery System: Recovery and Atomicity – Log – Based Recovery– Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems-ARIES

Data on External Storage – overview of physical storage media-RAID-File Organization and Indexing-Data Dictionary Storage– Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing —B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, *"Data base Management Systems"*, 3rd Edition, TATA McGrawHill, 2008.
2. Silberschatz, Korth, *"Data base System Concepts"*, 6th Edition, McGraw Hill, 2010.
3. C.J.Date, *"Introduction to Database Systems"*, 7th Edition, Pearson Education, 2002.

REFERENCES:

1. Peter Rob & Carlos Coronel, *"Data base Systems design, Implementation, and Management"*, 7th Edition, Pearson Education, 2000.
2. Elmasri Navrate, *"Fundamentals of Database Systems"*, 5th Edition, Pearson Education, 2007.