II Year II Semester

Code: 17CS404

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DATABASE MANAGEMENT SYSTEMS

Objectives:
To learn the principles of systematically designing and using large scale Database Management Systems for various applications.

UNIT-I: An Overview of Database Management, Introduction- What is Database System? What is Database-Why Database- Data Independence- Relational database Systems and Others- Summary.
Database system architecture, Introduction- The Three Levels of Architecture-The External Level- the Conceptual Level- the Internal Level- Database Administrator-The Database Management Systems- Client/Server Architecture.

UNIT-II:
The E/R Models, The Relational Model, Introduction to Database Design, Database Design and E-R Diagrams-Entities ,Attributes, and Entity Sets-Relationship and Relationship Sets-Conceptual Design With the E-R Models, The Relational Model Integrity Constraints Over Relations- Key Constraints –Foreign Key Constraints-General Constraints. Relational Algebra- Selection and Projection- Set Operation, Renaming – Joins- Division.

UNIT-III:
Queries, Constraints, Triggers: The Form of Basic SQL Query, Union, Intersect, and Except, Nested Queries, Aggregate Operators, Null Values, Complex Integrity Constraints in SQL, Triggers and Active Database.

UNIT-IV:
Schema Refinement (Normalization) : Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), Boyce-codd normal form(BCNF), Lossless join and dependency preserving decomposition, Fourth normal form(4NF).

UNIT-V: Transaction Management and Concurrency Control: Transaction, properties of transactions, Transaction management with SQL using commit rollback and save point. Concurrency control with locking methods : lock granularity, lock types, two phase locking protocol for ensuring serializability.

UNIT-VI: Overview of Storages and Indexing, Data on External Storage- File Organization and Indexing – Clustered Indexing – Primary and Secondary Indexes, Index Data Structures

OUTCOMES
1. Describe a relational database and object-oriented database.
2. Create, maintain and manipulate a relational database using SQL
3. Describe ER model and normalization for database design.
4. Examine issues in data storage and query processing and can formulate appropriate solutions.
5. Understand the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage.
6. Design and build database system for a given real world problem

TEXT BOOKS:
1. Introduction to Database Systems, CJ Date, Pearson
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw Hill 3rd Edition
3. Database Systems - The Complete Book, H G Molina, J D Ullman, J Widom Pearson

REFERENCES BOOKS:
1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education 10. Shailaja Gajjala and Usha Munipalle, Univerties press, 2015