3.5 DATABASE MANAGEMENT SYSTEM

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RATIONALE

Database management systems have become an essential component of everyday life in modern society. This course will acquaint the students with the knowledge of fundamental concepts of DBMS and its application in different areas. It will give exposure to the students about storage, manipulation and retrieval of data using query languages like Oracle/My SQL/SQL

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

CO1: Define and describe the database
CO2: Compile the design of database architecture
CO3: Convert database in the form of tables
CO3: Provide the security to the database
CO5: Respond various queries in the SQL

DETAILED CONTENTS

UNIT I

Introduction to Database system Concepts and Architecture

Database Systems; Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS Users; Actors on the scene, Database Administrators, Database Designers, End Users, System Analysts and Application Programmers, Workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel).

Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. Database Languages and Interfaces; DBMS Language, DBMS Interfaces. Classification of Database Management Systems- Centralized, Distributed, parallel and object based.

UNIT II

Data Modeling using E.R. Model (Entity Relationship Model) and Relational

Data Models Classification; File based or primitive models, traditional data models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities, Database design with E/R model.

Relational Model Concepts: Domain, Attributes, Tuples cardinlity, keys (Primary, Secondary, foreign, alternative keys) and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints and constraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key. Comparison b/w E/R model and Relational model.

UNIT III

Normalization Trivial and Non-trivial Dependencies.

Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/Codd normal form, denormalization.

UNIT IV

Database Access and Security

Creating and using indexes, creating and using views.

Database security, process controls, database protection, grant and revoke.

UNIT V

MYSQL/SQL (Structured Query Language)

SQL* DDL (Data Definition Languages): Creating Tables, Creating a table with data from another table, Inserting values into a table, updating columns of a Table, Deleting Rows, Dropping a Table. DML (Data Manipulation Language): Database Security and Privileges, Grant and Revoke Command, Maintaining Database Objects, Commit and Rollback, various types of select commands, various types of joins, sub query, aggregate functions. Challenges of My SQL. Introduction to Big Data. Understanding Big Data with samples.

PRACTICAL EXERCISES

1. Exercises on creation and modification of structure of tables.
2. Exercises on inserting and deleting values from tables.
3. Exercises on querying the table (using select command).
4. Exercises on using various types of joins.

5. Exercises on using functions provided by database package.
6. Exercises on commands like Grant, Revoke, Commit and Rollback etc.
7. Design of database for any application**.**

RECOMMENDED BOOKS

1. Dr. Renu Vig and Ekta Walia, "Fundamentals of Database Management Systems", an ISTE, Publication, New Delhi.
2. Arun K Majumdar and P Bhattacharya, "Database Management Systems", Tata Mc Graw Hill Education Pvt. Ltd., New Delhi.
3. ISRD Group, "Introduction to DBMS", Tata McGraw Hill Education Pvt. Ltd., New Delhi.
4. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas Publishing House Pvt. Ltd., New Delhi.
5. Date C.J. Adison Wesley, "An Introduction to Database Systems".
6. Elmasri/Navathe/Adison Wesley, "Fundamentals of Database Systems".
7. "SQL Unleashed", Hans Ladanyi Techmedia Publications, New Delhi.
8. e-books/e-tools/relevant software to be us as recommended by AICTE/HSBTE/NITTTR.

SUGGESTED WEBSITES

1. http://swayam.gov.in

INSTRUCTIONAL STRATEGY

This is hands on practice based subject and topics taught in the class should be practiced in the Lab regularly for development of required skills in the students. This subject contains five units of equal weight age. Server can be used as package to explain concepts.