4.3 DATABASE MANAGEMENT SYSTEM

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3 - 3

RATIONALE

Database and database 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, storage, manipulation and retrieval of data using query languages.

DETAILED CONTENTS

1. Introduction (8 hrs)

1.1 Database Systems

- 1.1.1 Introduction to Database and its purpose
- 1.1.2 Introduction to Database system
- 1.1.3 Why Database
- 1.1.4 History of Database System
- 1.1.5 Characteristics of the database approach
- 1.1.6 Advantages and disadvantages of database systems
- 1.1.7 Introduction to Conventional File System
- 1.1.7 Concept of files ,record, data, information retrieval.
- 1.1.9 Comparison between Conventional System and DataBase System

1.2 Classification of DBMS Users

- 1.2.1 Actors on the scene
- 1.2.2 Database Administrators, Database Designers, End Users, System Analysts and Application Programmers
- 1.2.3 Workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel)
- 1.2.4 History of data base System

2. Database System Concepts and Architecture (12 hrs)

2.1 Data models: (Physical Model, Object based Model, Record based Model Network Model, Heirachical Model) schemas, sub schemas instances, data base state. Case Study of models and schemas (examples student information System)

2.2 DBMS Architecture: Three Level of Architecures

- 2.2.1 The External level
- 2.2.2 The conceptual level
- 2.2.3 The internal level
- 2.2.4 Mappings

2.3 Data base Administrator and Administration, Database Management System – Advantage and Disadvantage, Classification of DBMS, DBMS Interfaces

2.4 Concept of centralized and Client /Server Architecture for DBMS: Single Tier, Two Tier and Three Tier

2.5 Data Independence

2.5.1 Logical data Independence
2.5.2 Physical data Independence

2.6 Database Languages and Interfaces

2.6.1 DBMS Language
2.6.2 DBMS Interfaces

2.7 Classification of Database Management Systems:Centralized, Distributed, parallel and Object based

3. Data Modeling using E.R. Model (Entity Relationship Model) (12 hrs)

3.1 Data Models Classification : File based or primitive models, traditional data models, semantic data models.
3.2 Entities and Attributes
3.3 Entity types and Entity sets
3.4 Key attribute and domain of attributes
3.5 Relationship among entities
3.6 Database design with E/R model
3.7 ER Design Issues
3.8 Mapping Constraints

4. Relational Model: (6 hrs)

4.1 Relational Model Concepts: Domain, Attributes, Tuples, Cardinality Keys(Primary, Secondary, foreign, Alternative Keys etc)and Relations

5. Structured Query Language (10 hrs)
Data definition language : Create, Alter, Drop commands]

5.1 Data Manipulation Language (DML)
5.2 Select command with where clause using conditional expressions and Boolean operators, group by clause, like operator.
5.3 Insert, Update and Delete commands

LIST OF PRACTICALS

1. Overview, Features and functionality, Application development in MS-Access
2. Exercises on different forms of select statement, altering and droping of tables
3. Exercises on creation of tables
4. Exercises on insertion of data into tables
5. Exercises on deletion of data using different conditions
6. Exercises on UPDATE statement

INSTRUCTIONAL STRATEGY

Explanation of concepts using real time examples, diagrams etc. For practical sessions books along with CDs or learning materials with specified activities are required. Various exercises and small applications should be given along with theoretical explanation of concepts.

RECOMMENDED BOOKS

Database system concepts by Abraham

1) Database system concepts by Abraham Silberschatz, Henry F.Kroth and S. Sudharshan; McGraw Hill Publishers, 5th Edition.

2) Fundamentals of Database Systems by Elmasri/Navathe/Adison Wesley

3) An introduction to database systems by Date C.J. Adison Wesley

4) SQL Unleashed by Hans Ladanyi Techmedia Publications, New Delhi

5) Database Management Systems by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., New Delhi

6) Fundamentals of Database Management Systems by Dr Renu Vig and Ekta Walia, - an ISTE, Publication, New Delhi

7) Oracle 8, The complete reference by Koch and Loney, Tata McGraw Hill Publications New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Allotted time (in hrs)	Allotted Marks (in %)
1	8	16
2	12	26
3	12	26
4	6	12
5	10	20
Total	**48**	**100**