

Government PG College, Ambala Cantt

Course File(Session 2023-24)

Name of Professor: Dr. Poonam Dhiman

Class: BCA-II/3rd Semester/ SECTION: A and B

Subject code and Name: BCA- 235 Fundamentals of Database System

SYLLABUS

Maximum Marks: 100

External: 80

Minimum Pass Marks: 35

Internal: 20

Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS.Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users.

UNIT – II

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances. Data Independence – Logical and Physical Data Independence. Classification of Database Management System, Centralized and Client Server architecture to DBMS. Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams. Basic Concepts of Hierarchical and Network Data Model.

UNIT – IV

Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

TEXT BOOKS:

1. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.

REFERENCE BOOKS:

1. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
2. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.

COURSE OBJECTIVES

The course objectives outlined are as follows:

- **Understand Database Systems Management Systems:** Understand Database System Applications, Purpose of Database Systems, Demonstrate Database Users and Administrators, History of Data base Systems.
- **Understand Fundamental of Database System Architecture:** Introduce the foundational principles of analyzing and designing database information systems, fostering an understanding of the techniques and methodologies employed in this process. Understand Conceptual Design for Large enterprises, Demonstrate Logical data base Design.
- **Analyzing Entity-Relationship Modeling:** Enable students to Understand Data base design , ER diagrams , Understand Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Demonstrate Additional features of ER Model, Conceptual Design with the ER Model
- **Understand Basics Relational Data Model:** Provide students with theoretical concepts of Relational Data Model, Apply Form of Basic SQL Query - Examples of Basic SQL Queries.

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a RDBMS.

COURSE OUTCOMES

After the successful completion of the course, students will be able to:

- Understand the fundamental concepts of Database Management System.
- Apply the systems approach to analyze and create database.
- Define the database System and recognize its characteristics.
- Identify different types of users and their role in developing database.
- Design ER-models to represent simple database application scenarios.
- Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
- Improve the database design by conceptual Modeling.
- Familiar with basic database storage structures and access techniques
- Articulate the fundamental principles of Relational Data Model.
- Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

Lesson Plan

Week No	Scheduled Dates	Topics to be covered
1	3-8 July	Basic Concepts-Data, Information, Records and files, Traditional file-based System-File based Approach
2	10-15 July	Limitations of File Based Approach-Characteristics of Database Approach
3	17-22 July	Database Management system(DBMS),Components of DBMS Environment, DBMS Function and components
4	24-31 July	Advantages and Disadvantages of DBMS
5	1-5 August	Revision and Practice;
6	7-12 August	Roles in a Database Environment-Data and Database Administrator, Database Designers, Application Developers and Users.
7	14-19 August	Database System Architecture - Three Levels Of Architecture, External, Conceptual and Internal Levels,
8	21-28 September	Schemas, Mapping and Instances, Data Independence -Logical and Physical Data Independence
9	1-9 September	Classification Of Database Management, Centralized and Client Server Architecture to DBMS.
10	11-16 September	Data Models: - Record-based Data Models
11	18-23 September	Object based data models, Physical data model and Conceptual modeling.
12	25-30 September	Entity relationship model, entity types, entity set, attributes relationship types,
13	3- 7 October	Relationship instance and ER diagram;
14	9-14 October	Revision and Practice;
15	16-21 October	Relational data model, Brief History, terminology in relational data structure
16	23-31 October	Relations and properties of relation, Keys, domains, integrity
17	2- 9 November	Constraints over relations, base tables and views ,

18	17-24 November	Revision and Practice;
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