Subject: File Organization and Fundamentals of Databases-I

Semester – I   **Subject Code: BS-11502**   **Lectures: 40**

Objectives:

The syllabus aims in equipping students with,

1. Understanding data and basic file organization techniques.
2. Learning and practicing data modeling using the entity-relationship model and developing database designs.
3. Understanding the needs of database processing and learn techniques for controlling the consequences of concurrent data access.

Unit 1: File Organization   No. of Lects. 11

Chapter 1: Introduction to File Organization
- Physical / logical files
- Special characters in files
- Fields & record organization (fixed , variable length)
- Types of file organization(heap, sorted, indexed, hashed)
- Choosing a file organization

Chapter 2: Indexed File Organization
- Overview of indexes
- Types of indexes (dense, sparse, clustered, primary, secondary)
- Tree (multilevel indexes, B+ tree)
- Activity:
  - B+ tree operations

BOS Members:

Prof. Manisha Bharambe (Subject Expert)

Prof. Poonam Ponde (Subject Expert)

Ms Febi Byju (Industry Expert)

Ms Sneha Shinde-Patil (Alumni)

Prof. Ashwini Kulkarni (Chairman)

Prof. Smita Borkar (Internal Faculty)

Prof. Shubhangi Jagtap (Internal Faculty)

Unit 2: DBMS & Conceptual Design	No. of Lects.=21

Chapter 3: Introduction to DBMS   4

- Data, Database and Concept of Database Management System(DBMS)
- File system Vs DBMS
- Structure of DBMS
- Users of DBMS
- Advantages of DBMS
- Data models (relational, hierarchical, network)
- Levels of abstraction
- Data independence
- Database Languages(DDL, DML,DCL,TCL)

Chapter 4 :Conceptual Design (Entity-Relationship Model)   15

- E-R Data Model (entities, attributes, entity sets, relations, relationship sets)
- Additional constraints (key constraints, participation constraints)
- Weak and Strong entity
- Aggregation and Generalization
- Conceptual design using E-R (entities Vs attributes, entity Vs relationship, binary Vs ternary)
- Conceptual design for small to large enterprises
- Activity
    - Case study

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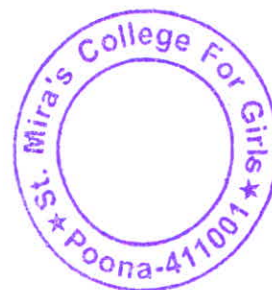
Unit 3: Relational Model and Relational Algebra	No. of Lects.=8

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Chapter 5: Relational data model and Algebra

- Relations (concepts, definition)
- Relational Model Concepts
  (Domain, Attributes, Tuples, Relations)
- Conversion of ER to Relational model
- Integrity constraints (key, referential integrity, general constraints)
- Relational Algebra :
  - ➤ Preliminaries
  - ➤ Relational Algebra operations(selection, projection, set operation, renaming, joins, division)
- Activity
  - ➤ Conversion of E-R to Relational Model
  - ➤ Relational Algebra queries

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