

# AMSW25 HUMAN FACTORS ENGINEERING

## UNIT-1 OBJECTIVES

- 1.1 This course offers a good understanding of advanced database concepts and technologies.
- 1.2 It prepares the student to be in a position to use and design databases for a variety of applications.

## UNIT-2 INTRODUCTION TO DATABASE SYSTEMS

- 2.1 Database System Concepts and Architecture, Data Models,
- 2.2 Data Independence, SQL: DDL, DML, DCL,
- 2.3 Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

## UNIT-3 QUERY PROCESSING AND OPTIMIZATION

- 2.1 Query Processing, Syntax Analyzer,
- 2.2 Query Decomposition,
- 2.3 Query Optimization,
- 2.4 Heuristic Query Optimization, Cost Estimation,
- 2.5 Cost Functions for Select, Join, Query Evaluation Plans.

## UNIT-4 TRANSACTION PROCESSING AND CONCURRENCY CONTROL

- 4.1 Transaction Processing Concepts,
- 4.2 Concurrency Control Techniques:
- 4.3 Two-phase Locking, Timestamp Ordering,
- 4.4 Multiversion, Validation, Multiple Granularity Locking.

## UNIT-5 OBJECT ORIENTED AND OBJECT RELATIONAL DATABASES:

- 5.1 Object Oriented Concepts,
- 5.2 Object Oriented Data Model,
- 5.3 Object Definition Language,
- 5.4 Object Query Language,
- 5.5 Object Relational Systems, SQL3, ORDBMS Design.

## UNIT-6 DISTRIBUTED DATABASES

- 6.1 Distributed Database Concepts,
- 6.2 Advantages and Disadvantages,
- 6.3 Types of Distributed Database Systems,
- 6.4 Data Fragmentation,
- 6.5 Replication and Allocation Techniques for Distributed Database Design,
- 6.6 Five Level Schema Architecture,
- 6.7 Query Processing,
- 6.8 Concurrency Control and Recovery in Distributed Databases.

## UNIT-7 BACKUP AND RECOVERY

- 7.1 Types of Database Failures,
- 7.2 Types of Database Recovery,
- 7.3 Recovery Techniques: Deferred Update, Immediate Update,
- 7.4 Shadow Paging, Checkpoints, Buffer Management.

#### **UNIT-8 INTRODUCTION TO DATA WAREHOUSING AND DATA MINING:**

- 8.1 Introduction to OLAP,
- 8.2 OLTP, Data Warehouse,
- 8.3 Data Marts, Data Mining, Data Mining Process, Big Data.

#### **UNIT-9 ENTERPRISE DATABASE PRODUCTS**

- 9.1 Enterprise Database Products,
- 9.2 Familiarity with IBM DB2 Universal Database,
- 9.3 Oracle, Microsoft SQL Server, MySQL, their features.

#### **Reference Books:**

1. Ramez Elmasri, Shamkant Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Education, 2007.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, Tata McGraw-Hill.

