

**COURSE TITLE** : **ADVANCED DATABASE MANAGEMENT SYSTEMS**  
**COURSE CODE** : **5061**  
**COURSE CATEGORY** : **E**  
**PERIODS/WEEK** : **4**  
**PERIODS/SEMESTER** : **72**  
**CREDITS** : **4**

**TIME SCHEDULE**

<b>MODULE</b>	<b>TOPICS</b>	<b>PERIODS</b>
1	Data Storage and Query Processing	18
2	Concurrency, Recovery and Security	18
3	Data Warehousing and Mining.	18
4	Emerging Technologies	18
	<b>Total</b>	<b>72</b>

**OBJECTIVES**

**MODULE I.**

- 1.1.0 Review of RDBMS.
  - 1.1.1 Codd's Rule.
  - 1.1.2 Introduction to file and database systems.
  - 1.1.3 Compare Network, Hierarchical and Relational Models.
- 1.2.0 Data Storage.
  - 1.2.1 Hierarchy of storage devices.
  - 1.2.2 Storage of databases.
  - 1.2.3 Placing of file records on disk.
  - 1.2.4 File operations.
- 1.3.0 Organization of records in Files.
  - 1.3.1 Explain Heap Files.
  - 1.3.2 Explain Sorted files.
  - 1.3.3 Hashing Techniques.
- 1.4.0 Indexing structures for files.
  - 1.4.1 Primary indexes.
  - 1.4.2 Clustering indexes.
  - 1.4.3 Secondary indexes.
- 1.5.0 Query Processing.
  - 1.5.1 Query Processing steps.
  - 1.5.2 Explain Query optimization.

**MODULE – II.**

- 2.1.0 Concurrency Control Techniques.
  - 2.1.1 Two-Phase Locking Techniques for Concurrency Control .
  - 2.1.2 Concurrency Control based on Timestamp ordering.
  - 2.1.3 Validation Techniques.
- 2.2.0 Database Recovery Techniques.

- 2.2.1 Recovery Concepts.
- 2.2.2 Recovery Techniques based on Deferred Update.
- 2.2.3 Shadow Paging.
- 2.3.0 Database Security.
  - 2.3.1 Database Security Issues.
  - 2.3.2 Access Control.
  - 2.3.3 Statistical database Security.

### **MODULE III**

- 3.1.0 Data Warehousing.
  - 3.1.1 Introduction , Definition and Terminology.
  - 3.1.2 Characteristics of data Warehouses.
  - 3.1.3 Data Modeling for data Warehouses.
  - 3.2.4 Functionality of a data Warehouse.
- 3.2.0 Data Mining Concepts.
  - 3.2.1 Overview of Data Mining Technology.
  - 3.2.2 Knowledge Discovery in Databases.
  - 3.2.3 Types Of Knowledge discovered During Data Mining.
  - 3.3.4 Application of Data Mining.
  - 3.3.5 Commercial Data Mining Tools.
- 3.3.0 Online Analytical Processing (OLAP).
  - 3.3.1 Concept of OLAP
  - 3.3.2 Implementing OLAP.

### **MODULE – IV**

- 4.1.0 Object Oriented Database.
  - 4.1.1 Overview of Object Oriented Concepts.
  - 4.1.2 Object Identity, Object Structure and Type Constructors.
  - 4.1.3 Encapsulation of Operations, Methods and Persistence.
  - 4.1.4 Complex Objects.
- 4.2.0 Parallel DBMS.
  - 4.2.1 Overview of Parallel DBMS.
  - 4.2.2 Architecture Of Parallel Database.
- 4.3.0 Distributed DBMS.
  - 4.3.1 Advantages of Distributed Database system.
  - 4.3.2 Distributed database Storage.
  - 4.3.3 Distributed Query Processing.
- 4.4.0 Mobile Databases.
  - 4.4.1 Concept of Mobile Database.
  - 4.4.2 Mobile Computing Architecture.

## **CONTENT DETAILS**

### **MODULE I**

Review of RDBMS – Codd’ Rule – conventional file system – database system – Database Models – Hierarchical – network – Relational – Data Storage and indexing – Hierarchy of storage devices – File operations – File organization – Heap - sorted – Hashing – Indexing – Single Level and Multi level – Query Processing.

### **MODULE II**

Concurrency Control Techniques – two Phase Locking – Time Stamp Ordering – Validation Techniques – Database recovery Techniques – Recovery Concepts – Shadow Paging – Database Security – Issues – Access control – Statistical database security.

### **MODULE III**

Data Warehousing – Introduction - - Definition and Terminology - Characteristics of data Warehouses - Data Modeling - Functionality - Data Mining - Concepts - Data Mining Technology - Knowledge Discovery in Databases - Types Of Knowledge discovered During Data Mining - Application - Commercial Data Mining Tools - Online Analytical Processing (OLAP) - Concept - Implementing OLAP

### **MODULE IV**

Object Oriented Database - Overview of Object Oriented Concepts - Object Identity - Object Structure and Type Constructors - Encapsulation of Operations - Methods and Persistence - Complex Objects - Parallel DBMS - Overview - Architecture - Distributed DBMS - Advantages - Distributed database Storage - Distributed Query Processing - Mobile Databases - Concept - - Mobile Computing Architecture

### **TEXT BOOKS**

1. Fundamentals of database systems – Ramez Elmasri, Shamkanth B.Navathe, (Pearson)
2. Introduction to Database Systems – ITL Education Solutions Ltd - PEARSON