Advanced Database Management System
MIE 121

Semester: Second **Full Marks: 100**

Credit Hour: 4 **Internal: 40**

Final Exam: 60

General Objectives;

* Visualize the detailed concept of DBMS.

* Conceptualize the importance of using Relational Algebra, SQL.

Specific Objectives;

Specific objectives of this course are;

* to make the student realize the importance of DBMS.

* to clarify the various DBMS concepts

* to familiarize the students with the techniques of keeping data secured

* to familiarize the students with giving the concept of transaction processing, distributed database, database administration and data mining.

COURSE CONTENT

Unit 1: Introduction **5 Hrs**

Introducing the Course, Concepts of data , data base and DBMS, Levels of Abstraction, Increasing trends of storage space required, Need of having DBMS.

Unit 2: Relational Algebra **10 Hrs**

Basic Concepts, DDL & DML, Structure of Relational Databases, Fundamental Relational-Algebra-Operations, Additional Relational-Algebra-Operations, Extended Relational-Algebra-Operations, Null Values, Modification of the Database.

Unit 3: SQL/Advanced SQL **10 Hrs**

General Concepts, Basic Structure of SQL Queries, Various Examples related with SQL queries, SQL Data type & Schemas, Integrity Constraints, Advanced SQL Features.

Unit 4: Relational Database Design **5 Hrs**

Functional Dependencies and Normal Forms, Atomic Domains, Decomposition using Functional Dependencies.

Unit 5 :Application Design & Development **5 Hrs**

User Interface & tools, Web Fundamental, Servlets and JSP, Authorization in SQL, Application Security.

Unit 6: Transaction Processing; Concurrency Control and Recovery **7 Hrs**

Transaction Concept, Atomicity and Durability, Concurrent Execution, Seriaizability & Recoverability, Concurrency Control Protocols, Deadlock Handling, Recovery Model of various failures.

Unit 7: Introduction to Object Oriented Database **3 Hrs**

General Concepts, Inheritance in SQL, Object Identity and reference type in SQL, Object Oriented Vs. Object Relational.

Unit 8: Introduction to distributed Database **3 Hrs**

General Concepts, Distributed Transaction, Concurrency Control, Query Processing

Unit 9: Data Base system Architecture **5 Hrs**

Client/Server Architecture, tier architecture, Distributed Systems

Unit 10 Advanced Transaction Processing **7 Hrs**

Transactional Workflows, E-Commerce, Real Time Transaction, Long Duration Transaction, Transaction Management in Multidatabase.

References

1. Database System Concepts, Silberschatz, Korth, & Sudarshan