COURSE HANDOUT

DATABASE MANAGEMENT SYSTEM (MCA-102)

MCA- 1st SEMESTER

ACADEMIC YEAR (2024-25)

Ms Arti Kotru

Associate Professor

P.G. Department of Computer Applications

Department of Computer Applications

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

www.mietjmu.in

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
MCA-102	Database Management System	PCC	4	4	0	0	40	60	100

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Identify the basic concepts, architecture and various data models used in Database Management Systems
CO2	Design ER-models to represent simple database application
CO3	Understand normalization theory and apply such knowledge to the normalization of a database.
CO4	Articulate the basic issues of transaction processing and concurrency control.
CO5	Implement advanced database queries using Structured Query Language (SQL).

Section-A

Unit-I

Database Concepts: Traditional file-based system, Conventional file organizations, Need of Database Management System, Components of DBMS, Introduction to hierarchical and network data models. Schemas and Instances, Data independence, three level Architecture of Database, Centralized and client server architecture for DBMS.

(10Hrs)

Unit-II

Relational Data Model: Entity relationship model, Relational Database Design using ER to Relational Mapping, EER Model, Joins, Relational Algebra and Relational Calculus Concepts, Queries using Relational Algebra and Calculus

(10Hrs)

Unit-III

Normalization: Concept of keys, Functional dependencies, Inference rules, Covers, Closure, Equivalence of functional dependencies, Multivalued dependencies, Theory of normalization, Normal forms (1st to 5th), BCNF, Join dependency, Domain key normal form. **(10 Hrs)**

Section-B

Unit- lV

Concurrency Control: Transaction processing, Deadlocks, Concurrency control, Locking techniques, Timestamp ordering, Recovery techniques, Distributed Database Concepts

(8Hrs)

Unit-V

SQL: SQL query processing, Table creation and management, inbuilt functions, Data integrity constraints, Views, Joins, Operators, Privileges, roles and security policies **(12Hrs)**

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Database System Concepts	Korth, Silberchatz	Mcgraw Hill	6th (2013)

Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Fundamentals of Database System	ElmasriRame, Navathe Shamkant	Pearson Education	7th (2015)
2.	The power of Oracle 9i	R. A. Parida	Firewall Media Publications	1st(2010)

COURSE PLAN		
Unit-I Database Concepts		
S.No	**Topics**	**Recommended Books**
1	Traditional file-based system	Book 1, Ch.1
2	Conventional file organizations	Book (reference)1, Ch.13
3	Need of Database Management System, Components of DBMS	Book 1, Ch.1
4	Introduction to hierarchical and network data models	Book 1 (reference), Ch.2
5	Schemas and Instances, Data independence	Book 1 (reference), Ch.2
6	Three level Architecture of Database, Centralized and client server architecture for DBMS	Book 1, Ch.20
Unit-II Relational Data Model		
7	Entity relationship model	Book 1, Ch.6
8	Relational Database Design using ER to Relational Mapping,	Book 1, Ch.6
9	Joins	Book 1, Ch.3
10	Relational Algebra	Book 1, Ch.2
11	Relational Calculus Concepts	Book 1, Ch.5
Unit-III Normalization		
12	Concept of keys	Book (reference)1, Ch.3
13	Functional dependencies	Book (reference)1, Ch.10
14	Inference rules	Book (reference)1, Ch.10
15	Covers	Book 1, Ch.7
16	Closure	Book 1, Ch.7
17	Equivalence of functional dependencies, Multivalued dependencies	Book (reference)1, Ch.10
18	Theory of normalization, Normal forms (1st to 5th), BCNF	Book (reference)1, Ch.10
Unit-IV Concurrency Control		
19	Transaction processing	Book 1, Ch.15
20	Deadlocks	Book 1, Ch.16
21	Concurrency control	Book 1, Ch.16
22	Locking techniques	Book 1, Ch.16

23	Timestamp ordering	Book 1, Ch.16
24	Recovery techniques	Book 1, Ch.17
25	Distributed Database Concepts	Book 1, Ch.22
Unit-V SQL		
26	SQL query processing	Book 1, Ch.3
27	Table creation and management	Book 1, Ch.3
28	Inbuilt functions	Book 1, Ch.4
29	Data integrity constraints	Book 1, Ch.4
30	Views	Book 1, Ch.3
31	Joins	Book 1, Ch.3
32	Operators	Book 1, Ch.3
33	Privileges	Book 1, Ch.3
34	Roles and security policies	Book 1, Ch.3

ADDITIONAL WEB RESOURCES

1.	https://www.udemy.com/relational-database-design/
2.	https://www.coursera.org/learn/introduction-to-databases
3.	https://nptel.ac.in/courses/106104135

GRADING AND ASSESSMENT

- **Sessional Test**: 20 marks
- **Assignment**: 10 marks
- **Attendance**: 10 marks
- **Final Examination**: 60 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:55 PM - 1:45 PM)
  Friday (12:55 PM - 1:45 PM)

- **Contact Information**
  arti.mca@mietjammu.in