



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Computer Science

M. Sc. (Information Technology) Programme

Subject Code & Name:- MITMC102-Database Management System

Teaching And Evaluation Scheme:

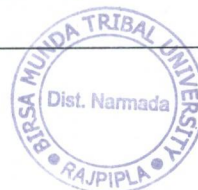
Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
4	-	-	4	50%	-	50%	-

Programme Name	M. Sc. (Information Technology)
Semester	1
Course Code	MITMC102
Course Title	Database Management System
Course Content Type (Th. / Pr.)	Th.
Course Credit	4
Sessions + Lab Per Week	4
Total Teaching/ Lab Hours	60
* 2 Lab = 1 session	

Learning Objectives

Upon successful completion of this course, students will be able to:

- Develop a comprehensive understanding of database management systems and their role in modern information systems.
- Impart knowledge of database architecture, data models, and entity-relationship modelling techniques.



- Design relational databases using normalization principles and integrity constraints.
- Understand SQL for database definition, manipulation, querying, and transaction processing.
- Explain transaction management, concurrency control, database security, backup, and recovery mechanisms.

Learning Outcomes

After successful completion of the course, students will be able to:

- Explain the concepts, architecture, and components of database management systems and various data models.
- Design conceptual and logical database schemas using Entity Relationship (ER) modelling techniques.
- Apply relational database concepts, keys, constraints, and normalization techniques to eliminate data redundancy and anomalies.
- Construct and execute SQL queries using DDL, DML, DCL, TCL commands, joins, subqueries, views, indexes, and built-in functions for efficient data retrieval and manipulation.
- Implement transaction management concepts, concurrency control mechanisms, and database security measures to ensure data consistency, integrity, and reliability

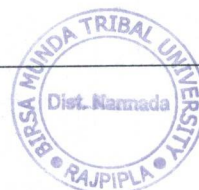
CLO – PLO Mapping Matrix

CLO/PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
CLO1	3	2	1	1	–	–	–	1	2
CLO2	3	3	3	2	1	1	–	2	2
CLO3	3	3	3	3	1	2	1	–	2
CLO4	3	3	3	3	–	1	1	1	2
CLO5	3	3	3	3	1	2	3	1	2

Detailed Contents

Unit	Topic/Sub Topic	Teaching Hours
I Database Architecture and Modelling	Introduction to DBMS • Concept and evolution • Characteristics, advantages and disadvantages • Structure and Architecture	15
	Data Models • Hierarchical, Network, Relational Models	

	• Entity Relationship Model • Entities, attributes, relationship • Entity Relationship Diagram	
II Relational Model and Normalization	Relational Model • Attributes, Tuples, Domain, Degree • Data constraint • Keys and its types (Super Key, Candidate key, primary key, alternate key, foreign key) • Relational Algebra • E F Codd's Rules Normalization • Concept, advantages and disadvantages • Data anomalies and functional dependency • Normal Forms ○ 1NF (First Normal Form) ○ 2NF (Second Normal Form) ○ 3NF (Third Normal Form) ○ BCNF (Boyce-Codd-Normal Form)	15
III Data Manipulation Commands	Data Manipulation (SQL) • Introduction and application • SQL datatypes • Operator and expressions • DDL Commands (CREATE, DROP, ALTER, TRUNCATE) • DML Commands (INSERT, UPDATE, DELETE) • DQL Commands (SELECT, WHERE, ORDER BY, GROUP BY, HAVING) • DCL Commands (GRANT, REVOKE) • TCL Commands (COMMIT, ROLLBACK, SAVEPOINT) • Join and its types • Sub queries and nested queries • Views and Indexes • SQL functions ○ Numeric Functions ○ Aggregate Functions ○ Character Functions ○ String Functions	15
IV	Transaction Management • Concept and need	15



Transaction Management and Database Security	• Transaction and its States • ACID Properties • Concept and need of concurrency control • Shared and exclusive locks • Deadlock handling • Basics of Backup and Recovery Database Security • Concept and need of authentication • Concept and need of authorization • Access control • Security threats in database management	
Reference Books		
5. Database System Concepts – Abraham, Korth and Sudarshan 6. Fundamentals of Database Systems – Elmasri and Navathe 7. Database Management Systems – Ramakrishnan and Gehrke		
Web Links		
1. https://www.geeksforgeeks.org/dbms/ 2. https://www.w3schools.com/sql/ 3. https://www.geeksforgeeks.org/dbms/transaction-management-in-dbms/ 4. https://dev.mysql.com/doc/		

L:: Lecture, **T::** Tutorial, **P::** Practical

CCE:: Continuous & Comprehensive Evaluation

(CCE theory includes Mid Semester Examination, Assignment, MCQ Quizzes, Seminar, Reflective Notes, Class Participation, Case Analysis and Presentation, Slip Tests (Announced/ Surprised), Attendance etc. or any combination of these)

PWE: Practical Work Examination

(PWE includes Laboratory Practical Work, Project Work, Viva simulation exercise work etc.)

SEE:: Semester End Evaluation

