SANKALCHAND PATEL UNIVERSITY ।। अथातो ज्ञानजिज्ञासा ।।	**FACULTY OF COMPUTER SCIENCE** **Master Of Computer Application (Integrated) (Sem-III)** In Effect from Academic Year 2023-24

Branch Name:	**IMCA**
Program Code:	**CS301**
Course Name:	**DATABASE MANAGEMENT SYSTEMS-II**
Course Code:	**1CS3010304T**
Pre-requisite Course:	**Basic knowledge of Database Management System**

Course Objectives:

- To understand the fundamental concepts of Database Management Systems.
- To understand the concepts necessary for designing, using and implementing database
- This will give conceptual insight about the Database system concept, transaction management and concurrency controls. Also, gives insight about relational database recovery, security operations and Basic SQL of databases.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
3	-		3	60	40	-	-	100

Course Contents:

Unit No	Topic	Total Hours	Weightage (%)
1	**Database System Concepts and Architecture:** Data Models, the three schema architectures and data independence, Database Languages and interfaces, Database System environment, Centralized and client / Server Architecture for DBMS, Classifications of Database Management Systems	8	20
2	**Transaction Management** Transaction Concept (Transaction State, Basic Definitions, ACID Property), Implementation of Atomicity and Durability (Shadow Paging Concept), Concurrent Execution (Reasons of Concurrent Execution, Serial and Concurrent Schedule), Serializability (Conflict and View Serializability), Recoverability of Schedules (Recoverable Schedule and Cascadeless Schedule)	10	20
3	**Concurrency Controls** Lock-based Protocol (Types of Lock and Deadlock Concept), Two-Phase Locking Protocol, Deadlock Handling (Deadlock Prevention Techniques like Wait-Die, Wound-Wait), Recovery of Deadlock (Selection of Victim, Rollback, Starvation), Insert and Delete Operations (Delete, Insertion, Phantom Phenomenon), Transaction Failure	10	20

4	**Database Recovery** Database Recovery Concepts, Types of Failures and Log-Based Recovery (Deferred Database Modification, Immediate Database Modifications), Shadow Paging and Checkpoints, Forward , Backward and Media Recovery **Database Security** Overview, Goals of Database Security, Discretionary Access Control (DAC), Mandatory Access Control, Firewall, Statistical Database Security, Data Encryption	10	20
5	**SQL Concepts** :Basics of SQL, DDL,DML,DCL, structure –creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated subqueries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types. transaction control commands – Commit, Rollback, Save point	10	20

Main Reference Text Book:

1) Silberschatz, Korth, Sudarshan, “Database System Concepts” 5th Edition, McGraw Hill

2) S. K. Singh, “Database Systems : Concepts, Design and Applications”, Pearson Education

3) Ivan Bayross, SQL, PL/SQL the Programming Language of Oracle, 4th Edition, BPB Publications

Reference Books:

1) C. J. Date, A. Kannan, S. Swamynathan, “An Introduction to Database Systems” 8th Edition (2006), Pearson Education
2) Ramakrishnan, Gehrke, “Database Management Systems” 3rd Edition, McGraw Hill
3) Peter Rob, Carlos Coronel, “Database Systems : Design, Implementation and Management”, 7th Edition (2007), Cengage Learning

List of Open Source Software/learning website:

1. https://www.tutorialspoint.com/dbms/index.htm
2. https://www.w3schools.in/dbms

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	The fundamental elements of database management systems	2 Understanding
CLO2	Familiar with basic Transaction management concept and execution techniques: serialization and schedules	1 Remembering 3 Applying,
CLO3	Familiar with basic Concurrency control and its techniques	2 Understanding, 3 Applying,
CLO4	To understand the concepts necessary for database Recovery and Security using and implementing database.Working on existing database systems, designing of database.	2 Understanding 3 Applying,
CLO5	Ability to create, insert, update, and delete database information using Database administrative.	1. Remember 2. Understand 3. Apply 4. Create 5. Evaluate
CLO6	Effective transformation of the real-world data into the relational data model of the Database system and data retrieval.	1. Understand 2. Apply 3. Create

Mapping of CLOs with Pos & PSOs

Course Learning Outcomes	Program Outcomes(POs)												Program Specific Outcomes (PSOs)	
Learning Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CLO1	**M**	**M**	**L**		M		**L**	M	L	M		**M**	**H**	**M**
CLO2	M	M	H			**M**	M			**H**	L	L	**H**	**M**
CLO3	H	M	H		**M**	**M**		**M**	L	M		H	**L**	**M**
CLO4	M		**H**	**M**	M	**L**	M	**L**	**M**		H	H	H	**M**
CLO5	H		**M**	**M**	**M**	**M**	**L**	**H**	**H**	M	H	H	H	**L**
CLO6	H	M						**H**	**L**	**L**	M	**H**	H	**H**

H: High, M: Medium, L: Low