Community College of Skill Development

Lesson Plan: Database Management System

Program: B.Voc Web Development **Semester:** 3rd **Course Code:** WD-303

Credits:

L	T	P
3	0	0

Course Objectives This course aims to impart a comprehensive understanding of Database Management Systems (DBMS) and relational model concepts, enabling students to design, implement, and manage databases efficiently while ensuring data integrity, security, and optimal performance through SQL queries, schema refinement, and transaction management techniques.

Course Outcomes:

After the successful completion of the course, students will be able to:
CO1: Analyze the role and significance of Database Management Systems (DBMS) in various applications and understand database system architecture.
CO2: Evaluate database design principles using Entity-Relationship (ER) diagrams, normalization techniques, and relational model concepts for effective schema design.
CO3: Apply Structured Query Language (SQL) to perform data manipulation, define constraints, and manage transactions efficiently in relational databases.
CO4: Create normalized database schemas, enforce integrity constraints, and manage transactions to ensure data consistency, reliability, and concurrency control effectively.

Equipment required in Classroom/ Laboratory/ Workshop

i. LCD/Projector
ii. Whiteboard/ Black Marker

Assessment Scheme

S.No.	Criteria	Marks
1	End Term Examination	75
2	Internal Evaluation Scheme	25
2a	Class Tests	15

2a (i)	Class Test-I	7.5
2a (ii)	Class Test-II	7.5
2(b)	Teacher Assessment (Continuous Evaluation)	10
2b (i)	Attendance	5
2b (ii)	Assignment / Presentation	5

Lect. No	Content to be covered	Pedagogy	Date of Implementation	Course Outcomes Covered	Faculty Sign
	Unit-1				
L1	Data, Information, DBMS introduction and applications.	Lecture-cum-discussion using examples and multimedia presentation; real-life case studies of DBMS applications.	**21-07-2025**	Analyze the role and significance of Database Management Systems (DBMS) in various applications and understand database system architecture.	
L2	Advantages and disadvantages of DBMS	Interactive discussion; comparison chart between File System and DBMS; question–answer session	**23-07-2025**		
L3	3 level Architecture, Data Independence	Lecture with diagrammatic explanation; demonstration through visual aids; classroom activity to identify levels.	**24-07-2025**		
L4	DBMS Users and DBA	Role-play activity to identify DBMS users; discussion	**28-07-2025**		

		on DBA responsibilities and functions.			
L5	ER Diagram (Entities, Attributes, Relationships)	Lecture-cum-demonstration; chalk and board explanation; drawing sample ER diagrams in class.	**30-07-2025**		
L6	Types of attributes, Examples of ER Diagrams	Hands-on practice creating ER diagrams for sample problems; group activity and peer review.	**4-08-2025**		
L7	Constraints, Keys	Lecture with examples; whiteboard demonstration; problem-solving on identifying primary, candidate, and foreign keys.	**5-08-2025**		
L8	Extended ER features, Generalization, Specialization, Aggregation	Lecture-cum-discussion; visual examples; group activity to model extended ER diagrams.	**7-08-2025**		
L9	Revision of Unit-1	Chalk and talk and worksheets	**13-08-2025**		
Unit-2					
L10	The Relational Model: Introduction to the relational model	Lecture using diagrams; compare ER and relational models; problem-solving exercises.	**14-08-2025**	Evaluate database design principles using Entity-Relationship (ER)	
L11	RDBMS Integrity Constraints	Explanation with examples; classroom	**18-08-2025**		

		exercises to identify and apply integrity constraints.		diagrams, normalization techniques, and relational model concepts for effective schema design.	
L12	Logical database design: ER to relational	Hands-on conversion of ER diagrams to relational schema; group activity using case studies.	**20-08-2025**		
L13	Introduction to views, Destroying/altering tables and views. Querying of data in RDBMS	Demonstration through SQL commands; lab-based practical session; student exercises.	**21-08-2025**		
L14	Relational Algebra	Lecture with examples and symbolic notation; solving practice problems in class.	**25-08-2025**		
L15	Operations in RA	Problem-solving approach; blackboard demonstration; group exercises.	**27-08-2025**		
L16	Relational Calculus -Tuple and domain relational calculus	Lecture-cum-discussion; worked examples and comparison between RA and RC.	**28-08-2025**		
L17	Revision of Unit-2	Chalk and talk and worksheets			
Unit-3					
L18	Basics of SQL	Demonstration of SQL commands; lab exercises;	**01-08-2025**	: Apply Structured Query	

		hands-on query writing.		Language (SQL) to perform data manipulation, define constraints, and manage transactions efficiently in relational databases.	
L19	DDL,DML languages	Practical session with examples of table creation and manipulation; mini assignments.	**03-09-2025**		
L20	DCL,TCL commands	Lecture with live SQL environment; practice tasks for permission and transaction control.	**04-09-2025**		
L21	SQL constraints(not null, Primary, Foreign key ,Unique, check, IN operator,)	Lecture-cum-lab demonstration; case-based examples for applying constraints.	**08-09-2025**		
L22	view and its types	Demonstration of creating, modifying, and using views; hands-on practice.	**10-09-2025**		
L23	join and its types	Interactive lecture using Venn diagrams; lab-based exercises for different joins.	**11-09-2025**		
L24	Functions(Aggregate, Numeric, Date)	Practical exercises; live demonstration in SQL editor; quiz on function outputs.	**15-09-2025**		
L25	String Functions in SQL	Hands-on practice using SQL functions; short exercises for syntax and usage.	**17-09-2025**		
L26	Set functions, , subqueries, correlated subqueries	Lecture-cum-lab activity; practice with	**18-09-2025**		

		nestedqueries; problem-solving.			
L27	Groupby, Having Clause	SQL query practice with group data examples; in-class exercises.	**06-10-2025**		
L28	Any, all, Exist, Order by	Lecture-cum-demonstration; example-based practice for condition testing and sorting.	**08-10-2025**		
L29	Commit, Rollback, Save point, cursors, stored procedures, Triggers	Lab-based practical demonstrations; guided examples on transaction management and PL/SQL blocks.	**09-10-2025**		
L30	Revision of Unit-3	Chalk and talk and worksheets	**13-10-2025**		
Unit-4					
L31	Introduction to schema refinement, functional dependencies, reasoning about FDs.	Lecture-cum-discussion; blackboard derivation of dependencies; numerical examples.	**15-10-2025**	Create normalized database schemas, enforce integrity constraints, and manage transactions to ensure data	
L32	1NF,2NF	Step-by-step normalization examples; classroom exercises converting relations to 1NF and 2NF.	**16-10-2025**		

L33	3NF, BCNF	Illustrative examples; comparison of normal forms; problem-solving exercises.	**27-10-2025**	consistency, reliability, and concurrency control effectively.	
L34	Properties of decompositions, normalization, schema refinement in database design, case studies	Case-based discussion; group project to normalize a given database design.	**29-10-2025**		
L35	Transactions Management: Transaction concept, transaction state,	Lecture-cum-demo using transaction examples; simulation of ACID properties through SQL examples.	**30-10-2025**		
L36	Implementation of atomicity and durability	Class activity	**3-11-2025**		
L37	Implementation of isolation, transaction definition in SQL,	Class activity	**6-11-2025**		
L38	Concurrent executions	Discussion on concurrency issues.	**10-11-2025**		
L39	Serializability, testing for Serializability	Interactive problem-solving;	**11-11-2035**		
L40	Recoverability	Lecture with examples;	**13-11-2025**		
L41	Concurrency Control	Class activity	**17-11-2025**		
L42	Revision of Unit-4	Chalk and talk and worksheets	**19-11-2025**		
L43	Revision of Full Syllabus	Chalk and talk and worksheets	**20-11-2025**		

Text Books:

1. Database System Concepts, 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.

2. Principles of Database and Knowledge – Base Systems, Vol 1 by J. D. Ullman, Computer Science Press.

Reference Books:

1. Fundamentals of Database Systems, 5th Edition by R. Elmasri and S. Navathe, Pearson Education
2. Foundations of Databases, Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-WesleyOxford University Press.