

Department of Computer Engineering & Applications

GLA University, Mathura

Teaching cum Learning Delivery Plan

Course: B.Tech CSE

Year: II

Sem: III

Session: 2023-24

Subject Name & Code: Database Management System (BCSC1003)

Total No of Lectures: 40

Lect	Module	Topic	Pre Reading Material	Sub Topic	Ref. No.	Page No.	Methodology	Learning Outcomes(Chapter wise)
1	1	Introduction	https://www.youtube.com/watch?v=3EJlovevfcA&t=6s	Introduction: An Overview of Database Management System, Database System vs File System	R1	1-20	PPT, Self study	Students will be able to understand the fundamental concepts of databases and its importance in modern applications.
2	1		https://www.youtube.com/watch?v=dfMgbbULh	Database System Concept and Architecture	R1	25-43	PPT	
3	1		https://www.youtube.com/watch?v=OwQoj3GJfn	Data Models	R3	5-12	PPT	
4	1		https://www.youtube.com/watch?v=IPvY9Gp83WM	Schema and Instances, Database Language and Interfaces (DDL, DML, DCL)	R3	5-12	PPT cum Chalk & Board	Students will be able to identify Structure Query Language statements used in creation and manipulation of database.
5	1		https://www.youtube.com/watch?v=S8xFSUjGYhs&t=24s	Database Development Life Cycle (DDLC) with Case Studies.	R1	303-311	PPT, Self study	Students will learn the various phases required for developing a database.
6	2	Data Modeling Using the Entity-Relationship Model:	https://www.youtube.com/watch?v=wOD02sezmm	ER Model Concepts, Notation for ER Diagram	R1	49-68	PPT cum Chalk & Board	Students will be able to conceptualize the database design. It will help to identify the entities, attributes, and relationships in database, and then map them to tables and columns.
7	2		https://prepinsta.com/dbms/mapping-constraints/	Mapping Constraints	R1	212-218	PPT cum Chalk & Board	Students will learn essential skills and knowledge to build robust, well-organized, and secure databases with the knowledge of mapping constraints.
8	2		https://www.youtube.com/watch?v=_UZLrD_R0T4&t=486s	Keys	R1	68-72	PPT cum Chalk & Board	Students will learn the concepts of keys and gain skills to design database as keys are crucial for data integrity, security etc.
9	2		https://www.educba.com/specialization-in-dbms/ https://www.educba.com/generalization-in-dbms/ https://www.educba.com/aggregation-in-dbms/	Specialization and generalization, Aggregation	R1	85-110	PPT, self study	Students will design database entities or subclasses that inherit attributes from more generalised entities, specialised entities into a super class as well as aggregate database entities of data into simple findings.
10	2		youtube.com/watch?v=I9BRmq7pgZ8&list=PLBI	Reduction of an ER Diagram to Tables	R3	62-68	PPT cum Chalk & Board	Students will be able to design relational databases used in business processes.

11	2		https://youtu.be/YiMpUhZ92JE	Extended ER Model.	R1	85-110	PPT cum Chalk & Board	Students will be able to identify the data requirements and constraints of your system, such as what entities and attributes are needed, how they are related, and what rules or conditions apply.
12	3	Relational Data Model and Language:	https://youtu.be/rnGeA8C6-K4	Relational Data Model Concepts, Integrity Constraints	R1, R3	125-138, 79-85	PPT cum Chalk & Board	Students will be able to learn basic concepts of relational data model, able to store data for real life scenario in organized form. Students will be able to specify rules from data in a relational databases.
13	3		https://www.scaler.com/topics/dbms/integrity-con	Entity Integrity, Referential Integrity, Domain Constraints	R1, R3	132-140, 85-89	PPT cum Chalk & Board	Students will be able to understand the fundamental concepts of Entity Integrity, Referential Integrity, and Domain Constraints in the context of database management systems.
14	3		https://www.youtube.com/watch?v=_UZLrD_R0T4&t=191s	Keys Constraints, Primary Key, Foreign Key, Candidate Key, Super Key	R1	68-72	PPT cum Chalk & Board	Students will be able to Define the concept of keys in the context of database management systems and explain their importance in ensuring data integrity and uniqueness. will be able to differentiate between different types of keys, such as Primary Key, Foreign Key, Candidate Key, and Super Key, and understand their specific roles and functionalities.
15	3		https://www.youtube.com/watch?v=8PJGw123zeE&list=PLBlnK6fEygRi_CUQ-FXxgzKQ1dwr_ZJWZ&index=22	Relational algebra :Basic RA operators -Select, Project, Union, Intersection	R1	149-153	PPT cum Chalk & Board	Students will learn concept of RA operators with implementation.
16	3		https://www.youtube.com/watch?v=evDqDiJpw5k	Minus, Cartesian Product, Division operation, Rename and assignment operator	R1	156-161	PPT cum Chalk & Board	Students will be able to understand the various RA operators functioning in practical scenario.
17	3		https://www.youtube.com/watch?v=sJtuZq-LEQM&list=PLBlnK6fEygRi_CUQ-FXxgzKQ1dwr_ZJWZ&index=24	Extended RA Operators - , Natural Join, Theta Join, Equi Join	R1	161-168	PPT cum Chalk & Board	Students will learn about various joins and their implementations.
18	3		https://www.youtube.com/watch?v=4kqoN9-rqIQ&list=PLBlnK6fEygRi_CUQ-FXxgzKQ1dwr_ZJWZ&index=25	Outer Joins (Left, Right, Full),	R1, R3	157-165, 230-235	PPT cum Chalk & Board	Students will learn all types of outer joins with examples.
19	4		https://www.youtube.com/watch?v=qn5neFBpU4	Functional Dependencies	R1	304-306	PPT cum Chalk & Board	Students will learn to ensure the same data doesn't exist repetitively across a database or network of databases. Maintain the quality and integrity of data.
20	4	Database Design	https://www.codingninjas.com/studio/library/canonical-cover	Canonical Cover	R1	549-552		Students will learn to remove functional dependencies while preserving the same meaning and integrity constraints.
21	4		https://www.youtube.com/watch?v=5GDTIUvIHE	Normal Forms, First, Second,	R1	315-319		Students will learn to eliminate redundant data, minimize data

22	4	Database Design & Normalization I	https://www.youtube.com/watch?v=leSai2JVm78	Third Normal Forms, BCNF	R1	319-326		modification errors, and simplify the query process.
23	4		https://www.youtube.com/watch?v=qwl0oe3-g9g	Lossless Join and Dependency Preserving Decomposition,	R1	336-340	PPT cum Chalk & Board	student will learn concept of Lossless Join and Dependency Preserving Decomposition.
24	4		https://www.tutorialspoint.com/multivalued-depe	MVD and 4th Normal Form	R1	347-351	PPT	students will learn to identify & eliminate redundancy & anomalies.
25	4		https://www.youtube.com/watch?v=Sabwow_e2	JD and 5th Normal Form, Inclusion Dependence.	R1	571-575	PPT	Students will learn inclusion dependence by using Multivalued dependency and join dependency
26	5	Database Design & Normalization II	https://www.youtube.com/watch?v=E--yzX05_k8	Indexing	R1	455-475	PPT cum Chalk & Board	Students will learn the knowledge and skills to design, implement, and optimize indexing strategies
27	5		https://www.youtube.com/watch?v=s8QlJoL1G6w	Structure of Index files and Types (primary , secondary and clustering)	R1	455-475	PPT cum Chalk & Board	Understanding different index types empowers students to improve query performance and database management.
28	5		https://www.youtube.com/watch?v=vjrHialfOI8	Dense and Sparse Indexing	R1	455-475	PPT, self study	Students will learn to make decisions for index selection and implementation in databases.
29	6	Transaction Processing Concept:	https://www.youtube.com/watch?v=t5hsV9lC1rU	Transaction System	R3	565-576	PPT cum Chalk & Board	Students will gain a thorough understanding of how to manage data consistency and reliability.
30	6		https://www.youtube.com/watch?v=s8QlJoL1G6w	Testing of Serializability, Serializability of Schedules,	R3	565-576	PPT cum Chalk & Board	Students will be able to test whether the given schedule is serializable or not.
31	6		https://www.youtube.com/watch?v=zy0ba0lok1Y	Conflict & View Serializable Schedule	R3	576-586	PPT cum Chalk & Board	Students will learn how to ensure consistency of the database in non serial environment.
32	6		https://www.geeksforgeeks.org/database-recovery-techniques-in-dbms/	Recoverability, Recovery from Transaction Failures	R3	639-653	PPT cum Chalk & Board	Students will learn recovery techniques and prevent data loss in transaction systems.
33	6		https://youtu.be/0YhOYqPeq0g	Log Based Recovery	R3	639-653	PPT, self study	Students will be able to understand and apply log based recovery.
34	6		https://youtu.be/lz66t1uyYIM	Deadlock Handling.	R3	615-616	PPT, self study	Students will learn about Deadlock concepts and ways to handle it
35	7	Concurrency Control Techniques	https://www.youtube.com/watch?v=fTRF3cr10R0	Concurrency Control,	R3	591-603	PPT	students will get the idea about concurrency control its need and problem with concurrent access
36	7		https://www.youtube.com/watch?v=1pUaEDNLW	Locking Techniques for Concurrency Control, 2PL,	R3	604-606	PPT cum Chalk & Board	student learn how to deal with concurrency through locks.

37	7	Techniques	https://www.youtube.com/watch?v=27NtGV1vN0	Time Stamping Protocols for Concurrency Control, Validation Based Protocol.	R3	591-603	PPT, self study	student learn shortcomings of locks and use timestamp to deal with it. student learn how validation based protocol works
38	8	Distributed Database:	https://www.youtube.com/watch?v=aUyqZxn12s	Introduction of Distributed Database	R4	3-6	PPT, self study	Students will be able to know: what is Distributed database, How it is different from Centralized DB, Why and where it is needed, what are the goals and challenges of DDBMS.
39	8		https://www.youtube.com/watch?v=GzDvynMxM	Data Fragmentation	R4	93-125	PPT cum Chalk & Board	Students will be able to understand what is Fragmentation, Why and Where it is needed and what are it's type.
40	8		https://www.youtube.com/watch?v=7FMTEmyyX	Data Replication	R4	126-133	PPT cum Chalk & Board	Students will be able to understand what is Replication, Why and Where it is needed.
References								
R1. Elmasri and Navathe (2010), "Fundamentals of Database Systems", 5th Edition, Addison Wesley								
R2. Date C J, "An Introduction to Database Systems", 8th Edition, Addison Wesley.								
R3. Korth, Silbertz and Sudarshan (1998), "Database Concepts", 4th Edition, TMH.								
R4. M. Tamer Oezsu, Patrick Valduriez (2011). "Principles of Distributed Database Systems", 2nd Edition, Prentice Hall.								