

Lovely Professional University, Punjab

Course Code	Course Title	Course Planner	Lectures	Tutorials	Practicals	Credits
INT306	DATABASE MANAGEMENT SYSTEMS	14557::Avinash Kaur	0	0	5	3
Course Weightage	ATT: 5 CA: 25 MTT: 20 ETT: 50	Exam Category: 13: Mid Term Exam: All MCQ – End Term Exam: MCQ + Subjective				
Course Orientation	KNOWLEDGE ENHANCEMENT, PLACEMENT EXAMINATION(Mass Recruiters), SKILL ENHANCEMENT					

Course Outcomes :Through this course students should be able to

CO1 :: develop skills and understanding in the database design and make use of database management systems for applications

CO2 :: develop understanding about relational algebra, relational model and SQL for implementing and maintaining databases

CO3 :: develop understanding about the different issues involved in the design and implementation of a database system

CO4 :: develop skills and understanding about the real time transaction management systems and the concurrency control techniques

CO5 :: compose programming constructs such as functions, stored procedures and triggers that can be shared by multiple forms, reports and data management applications

	TextBooks (T)		
Sr No	Title	Author	Publisher Name
T-1	DATABASE SYSTEM CONCEPTS	HENRY F. KORTH, ABRAHAM SILBERSCHATZ, S. SUDARSHAN	MCGRAW HILL EDUCATION

	Reference Books (R)		
Sr No	Title	Author	Publisher Name
R-1	DATABASE SYSTEMS: MODELS, LANGUAGES, DESIGN AND APPLICATION PROGRAMMING	RAMEZ ELMASRI, SHAMKANT B. NAVATHE	PEARSON
R-2	AN INTRODUCTION TO DATABASE SYSTEMS	C. J. DATE, S. SWAMYNATHAN, A. KANNAN	PEARSON
R-3	SQL, PL/SQL: THE PROGRAMMING LANGUAGE OF ORACLE	IVAN BAYROSS	BPB PUBLICATIONS
R-4	SIMPLIFIED APPROACH TO DBMS	PRATEEK BHATIA AND GURVINDER SINGH	KALYANI PUBLISHERS

Relevant Websites (RW)		
Sr No	(Web address) (only if relevant to the course)	Salient Features
RW-1	https://www.geeksforgeeks.org/deadlock-in-dbms/	Deadlock in DBMS
RW-2	https://www.geeksforgeeks.org/database-management-system-er-model/	Database Design
RW-3	https://www.geeksforgeeks.org/database-management-system-introduction-set-1/	Introduction to Database Systems
RW-4	https://www.geeksforgeeks.org/database-management-system-introduction-set-2-3-tier-architecture/	Database Management System Introduction
RW-5	https://www.geeksforgeeks.org/concurrency-control-introduction/	Introduction to Concurrency Control
RW-6	https://www.geeksforgeeks.org/exception-handling-plsql/	Types of exceptions and Exception Handling
RW-7	https://www.tutorialspoint.com/plsql/plsql_exceptions.htm	Exception Handling
RW-8	https://www.geeksforgeeks.org/dbms-file-organization-set-1/	Types of File Organizations
RW-9	https://cs.nyu.edu/courses/Fall12/CSCI-GA.2433-001/lecture9.pdf	File organization
RW-10	https://www.tutorialspoint.com/plsql/	Procedures, Cursors and Triggers
RW-11	https://www.tutorialspoint.com/sql/sql-sub-queries.htm	SQL - Sub Queries
RW-12	https://www.w3schools.com/sql/sql_constraints.asp	SQL Constraints
RW-13	https://www.geeksforgeeks.org/sql-join-set-1-inner-left-right-and-full-joins/	SQL Join
RW-14	https://www.w3schools.com/sql/sql_view.asp	SQL Views
RW-15	https://www.studytonight.com/dbms/set-operation-in-sql.php	SET Operations in SQL
RW-16	https://www.w3schools.com/sql/sql_count_avg_sum.asp	Aggregate Function in SQL
RW-17	https://www.tutorialcup.com/dbms/keys.htm	Database Keys
RW-18	https://www.tutorialspoint.com/dbms/dbms_transaction.htm	Transactions and Schedules
RW-19	https://www.coursera.org/lecture/intro-sql/basic-sql-operations-0jEbQ	Basic SQL Operations
RW-20	https://www.w3schools.com/sql/sql_operators.asp	SQL Operators
RW-21	https://www.mongodb.com/nosql-explained	NoSQL Database
RW-22	http://www.cs.sfu.ca/CourseCentral/354/zaiane/material/notes/Chapter11/node1.html	Indexing and Hashing
RW-23	http://en.wikipedia.org/wiki/PL/SQL	Programming Constructs in Databases
RW-24	http://db.grussell.org/section015.html	Transaction and Recovery
RW-25	http://en.wikipedia.org/wiki/Concurrency_control	Concurrency Control

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

RW-26	http://en.wikipedia.org/wiki/Transaction_processing	Transaction Processing
RW-27	http://holowczak.com/database-normalization/	Normalization
RW-28	http://www.w3schools.com/sql/	SQL Command
RW-29	http://jcsites.juniata.edu/faculty/rhodes/dbms/relcalc.htm	Relational Calculus
RW-30	http://www.databasteknik.se/webbkursen/relalg-lecture/	Relational Algebra
RW-31	http://www.siue.edu/~dbock/cm450/3-ermodel.htm	E-R Modeling
RW-32	http://unixspace.com/context/databases.html	Data Models
RW-33	http://jcsites.juniata.edu/faculty/rhodes/dbms/dbarch.htm	Three level Database Architecture
RW-34	http://infolab.stanford.edu/~ullman/fcddb.html	Database System course by Stanford
RW-35	http://nptel.iitm.ac.in/video.php?subjectId=106106093	Video Tutorials from the IIT
RW-36	http://nptel.iitm.ac.in/courses/IIT-MADRAS/Intro_to_Database_Systems_Design/	DBMS PDF of IIT-M
RW-37	https://www.tutorialspoint.com/hadoop/hadoop_big_data_overview.htm	Introduction to Big data

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples
Week 1	Lecture 1	Introduction to Databases (purpose of database systems, components of dbms, applications of dbms)	T-1 R-1 R-4	RW-3 RW-34 RW-35 RW-36	Lecture zero and Introduction to Database System, components of DBMS and its applications	Students will learn about the basics of database system	Discussion	Bank database, University database , Railways database, business applications and Social Media Sites

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Week 1	Lecture 2	Introduction to Databases (purpose of database systems, components of dbms, applications of dbms)	T-1 R-1 R-4	RW-3 RW-34 RW-35 RW-36	Lecture zero and Introduction to Database System, components of DBMS and its applications	Students will learn about the basics of database system	Discussion	Bank database, University database , Railways database, business applications and Social Media Sites
	Lecture 3	Introduction to Databases (three tier dbms architecture)	T-1 R-1 R-2 R-4	RW-4 RW-33 RW-35 RW-36	2-tier and Three level dbms architecture, Internal , Conceptual and External Level, mappings, practice MCQ till this topic	Students will learn three level architecture of database system	Discussion using Power Point Presentation	Bank database, University database , Railways database
	Lecture 4	Introduction to Databases (three tier dbms architecture)	T-1 R-1 R-2 R-4	RW-4 RW-33 RW-35 RW-36	2-tier and Three level dbms architecture, Internal , Conceptual and External Level, mappings, practice MCQ till this topic	Students will learn three level architecture of database system	Discussion using Power Point Presentation	Bank database, University database , Railways database
	Lecture 5	Introduction to Databases (data independence, database schema, instance)	T-1 R-1 R-2 R-4	RW-35 RW-36	Physical and logical data independence, database schema and its types, database state and instances	Students will learn about the basics of database system	Discussion using Power Point Presentation	Applications that run on World Wide Web
Week 2	Lecture 6	Introduction to Databases (data independence, database schema, instance)	T-1 R-1 R-2 R-4	RW-35 RW-36	Physical and logical data independence, database schema and its types, database state and instances	Students will learn about the basics of database system	Discussion using Power Point Presentation	Applications that run on World Wide Web
	Lecture 7	Introduction to Databases (data modeling, entity relationship model, relational model)	T-1 R-1 R-2 R-4	RW-2 RW-31 RW-32 RW-35 RW-36	Overview of the Design Process, Entity - Relationship Model and Notations, Attributes in Entity Sets, E-R Diagrams, Reduction to Relational Schemas, participation, weak and strong entities, relationship sets, entity set, cardinality ratios, degree, cardinality of relations, Relational Models	Understand about modeling the real life situations as a collection of entities, their attributes and relationship between those entities	Case Study and Discussion	Design of the database at physical, logical and view levels of any application

Week 2	Lecture 8	Introduction to Databases (data modeling, entity relationship model, relational model)	T-1 R-1 R-2 R-4	RW-2 RW-31 RW-32 RW-35 RW-36	Overview of the Design Process, Entity - Relationship Model and Notations, Attributes in Entity Sets, E-R Diagrams, Reduction to Relational Schemas, participation, weak and strong entities, relationship sets, entity set, cardinality ratios, degree, cardinality of relations, Relational Models	Understand about modeling the real life situations as a collection of entities, their attributes and relationship between those entities	Case Study and Discussion	Design of the database at physical, logical and view levels of any application
	Lecture 9	Introduction to Databases (data modeling, entity relationship model, relational model)	T-1 R-1 R-2 R-4	RW-2 RW-31 RW-32 RW-35 RW-36	Overview of the Design Process, Entity - Relationship Model and Notations, Attributes in Entity Sets, E-R Diagrams, Reduction to Relational Schemas, participation, weak and strong entities, relationship sets, entity set, cardinality ratios, degree, cardinality of relations, Relational Models	Understand about modeling the real life situations as a collection of entities, their attributes and relationship between those entities	Case Study and Discussion	Design of the database at physical, logical and view levels of any application
	Lecture 10	Introduction to Databases (data modeling, entity relationship model, relational model)	T-1 R-1 R-2 R-4	RW-2 RW-31 RW-32 RW-35 RW-36	Overview of the Design Process, Entity - Relationship Model and Notations, Attributes in Entity Sets, E-R Diagrams, Reduction to Relational Schemas, participation, weak and strong entities, relationship sets, entity set, cardinality ratios, degree, cardinality of relations, Relational Models	Understand about modeling the real life situations as a collection of entities, their attributes and relationship between those entities	Case Study and Discussion	Design of the database at physical, logical and view levels of any application

Week 3	Lecture 11	Relational Query Languages (relational algebra)	T-1 R-1 R-4	RW-29 RW-30	Relational Algebra Operations	Students will learn about specifying the requirements, the operations needed to get the desired results without procedural syntax	Discussion and Demonstration	Writing the queries on the university/Employee/ schema using algebraic operations
	Lecture 12	Relational Query Languages (introduction to data definition language, data manipulation)	T-1 R-1 R-3 R-4	RW-28 RW-36	SQL Components: DDL and DML commands	Learn the commands to work with the structure of the table and manipulation of data values	Live Demonstration	Performing operations on the university/Employee/ Customer schema
	Lecture 13	Relational Query Languages (introduction to data definition language, data manipulation)	T-1 R-1 R-3 R-4	RW-28 RW-36	SQL Components: DDL and DML commands	Learn the commands to work with the structure of the table and manipulation of data values	Live Demonstration	Performing operations on the university/Employee/ Customer schema
	Lecture 14	Relational Query Languages (data control and transaction control language)	T-1 R-1 R-3 R-4	RW-28	SQL Components: DCL TCL commands	Learn the commands to work with Data control and Transaction control language	Live Demonstration	Performing operations on the university schema
	Lecture 15	Relational Query Languages (integrity constraints)	T-1 R-1 R-3 R-4	RW-28 RW-36	Integrity Constraints: Primary Key, Foreign Key, UNIQUE, NOT NULL, CHECK, DEFAULT	Learn about ensuring integrity in the database	Demonstration using Schema and Discussion	University Schema
Week 4	Lecture 16	Relational Query Languages (database keys)	T-1 R-1 R-4	RW-17	Primary Key Foreign Key Candidate key Composite key Alternate key Super key	Students will learn about different database keys and their use in database system	Demonstration using Schema and Discussion	University Schema
	Lecture 17	Relational Query Languages (sql basic operations)	T-1 R-1 R-3 R-4	RW-19 RW-20 RW-28	SQL Basic operations, SQL Operators, SORTING, ROWID, NULL values, Practice Queries on operators, Practice MCQ	Students will learn about the basic operations in SQL	Live Demonstration	Performing operations on the university/Employee/ Student schema

Week 4	Lecture 18	Relational Query Languages (sql basic operations)	T-1 R-1 R-3 R-4	RW-19 RW-20 RW-28	SQL Basic operations, SQL Operators, SORTING, ROWID, NULL values, Practice Queries on operators, Practice MCQ	Students will learn about the basic operations in SQL	Live Demonstration	Performing operations on the university/Employee/Student schema
	Lecture 19	Relational Query Languages (aggregate functions)	T-1 R-2 R-3 R-4	RW-16	Aggregate Functions, Group By, Having Clauses	Students will learn about group functions and their use as well as implementation	Live Demonstration	Performing operations on the university schema
	Lecture 20	Relational Query Languages (sql joins)	T-1 R-1 R-3 R-4	RW-13	Joins and its types, Natural join, Inner join, Outer join, Cross join, Self join	Students will learn about accessing the data from multiple tables	Live Demonstration	Performing joins operations on university schema
Week 5	Lecture 21				Test - Code based 1			
	Lecture 22	Relational Query Languages (set operators, views)	T-1 R-1 R-3 R-4	RW-14 RW-15	Set operations in database system, Views and its types	Students will learn about set operations as well as creating virtual tables for the purpose of security	Live Demonstration	Performing set operations and creating views on university/emp-dept, customer-loan schema
	Lecture 23	Relational Query Languages (set operators, views)	T-1 R-1 R-3 R-4	RW-14 RW-15	Set operations in database system, Views and its types	Students will learn about set operations as well as creating virtual tables for the purpose of security	Live Demonstration	Performing set operations and creating views on university/emp-dept, customer-loan schema
	Lecture 24	Relational Query Languages (subqueries)	T-1 R-1 R-4	RW-11 RW-35 RW-36	Sub Queries and types of Sub Queries	Students will learn about the use and implementation of different types of Sub Queries	Live Demonstration	Performing operations on the university schema
	Lecture 25	Relational Query Languages (subqueries)	T-1 R-1 R-4	RW-11 RW-35 RW-36	Sub Queries and types of Sub Queries	Students will learn about the use and implementation of different types of Sub Queries	Live Demonstration	Performing operations on the university schema

Week 6	Lecture 26	Relational Database Design (data integrity rules, functional dependency)	T-1 R-1 R-2 R-4	RW-12 RW-27 RW-36	Integrity rules: Domain Constraints, Referential Integrity Constraints, Entity integrity and FD, different types of dependencies, Armstrong's Interference Rules	Learn about ensuring integrity in the database and Functional dependencies	Demonstration using Schema and Discussion	University Schema
	Lecture 27	Relational Database Design (data integrity rules, functional dependency)	T-1 R-1 R-2 R-4	RW-12 RW-27 RW-36	Integrity rules: Domain Constraints, Referential Integrity Constraints, Entity integrity and FD, different types of dependencies, Armstrong's Interference Rules	Learn about ensuring integrity in the database and Functional dependencies	Demonstration using Schema and Discussion	University Schema
	Lecture 28	Relational Database Design (need of normalization, first normal form, second normal form)	T-1 R-1 R-2 R-4	RW-27 RW-35 RW-36	need of normalization, objectives, Anomalies, Decomposition, Un-normalized table, First Normal Form, Second Normal Form	Students will learn about the basics of relational database design	Demonstration using Schema and Discussion	Designing of any relational database
	Lecture 29	Relational Database Design (need of normalization, first normal form, second normal form)	T-1 R-1 R-2 R-4	RW-27 RW-35 RW-36	need of normalization, objectives, Anomalies, Decomposition, Un-normalized table, First Normal Form, Second Normal Form	Students will learn about the basics of relational database design	Demonstration using Schema and Discussion	Designing of any relational database
	Lecture 30	Relational Database Design (third normal form, boyce codd normal form)	T-1 R-1 R-2 R-4	RW-27	Third Normal Form, BCNF, 3NF vs BCNF	Students will learn about the basics of relational database design	Demonstration using Schema and Discussion	Designing of any relational database
Week 7	Lecture 31	Relational Database Design (multivalued dependencies, fourth normal form)	T-1 R-1 R-2 R-4	RW-27 RW-36	Decomposition using Multivalued Dependencies, Fourth Normal Form,	Learn about Multivalued dependencies in database design	Demonstration using Schema and Discussion	Any relational database design
	Lecture 32	Relational Database Design (join dependencies, fifth normal form and pitfalls in relational database design)	T-1 R-1 R-2 R-4	RW-27 RW-35 RW-36	Join dependency, Fifth normal Form and pitfalls in relational database design	Learn about join dependencies in database design	Demonstration using Schema and Discussion	Any relational database design

Week 7	Lecture 33	Relational Database Design (join dependencies, fifth normal form and pitfalls in relational database design)	T-1 R-1 R-2 R-4	RW-27 RW-35 RW-36	Join dependency, Fifth normal Form and pitfalls in relational database design	Learn about join dependencies in database design	Demonstration using Schema and Discussion	Any relational database design
SPILL OVER								
Week 0	Lecture 0				Spill Over			
MID-TERM								
Week 8	Lecture 36	Database Transaction Processing(transaction system concepts, desirable properties of transactions)	T-1 R-1 R-4	RW-18 RW-24 RW-26	Transaction Concept, Transaction Properties, Transaction States	Understand about the transaction, phases of a transaction and the properties a transaction should possess	Discussion using Power Point Presentation	ATM/Debit/Credit Transactions
	Lecture 37	Database Transaction Processing(transaction system concepts, desirable properties of transactions)	T-1 R-1 R-4	RW-18 RW-24 RW-26	Transaction Concept, Transaction Properties, Transaction States	Understand about the transaction, phases of a transaction and the properties a transaction should possess	Discussion using Power Point Presentation	ATM/Debit/Credit Transactions
	Lecture 38	Database Transaction Processing(schedules, serializability of schedules)	T-1 R-1 R-4	RW-18	Schedules and its types, Schedules(Serial and Concurrent) , Types of Conflicts, Serializability (Conflict Serializability)	Learn about the order of the transaction and about ensuring the consistency of the database	Discussion using Power Point Presentation	ATM Transaction Scenarios
	Lecture 39	Database Transaction Processing(schedules, serializability of schedules)	T-1 R-1 R-4	RW-18	Schedules and its types, Schedules(Serial and Concurrent) , Types of Conflicts, Serializability (Conflict Serializability)	Learn about the order of the transaction and about ensuring the consistency of the database	Discussion using Power Point Presentation	ATM Transaction Scenarios
	Lecture 40	Database Transaction Processing(concurrency control)	T-1 R-1	RW-1 RW-5 RW-25	Lock Based Protocols, Deadlock Handling, Timestamp Based Protocol, 2PL	Understand about maintaining the database consistency in case of concurrent execution through various protocols	Discussion using Power Point Presentation	Online Transaction Scenarios
Week 9	Lecture 41	Database Transaction Processing(concurrency control)	T-1 R-1	RW-1 RW-5 RW-25	Lock Based Protocols, Deadlock Handling, Timestamp Based Protocol, 2PL	Understand about maintaining the database consistency in case of concurrent execution through various protocols	Discussion using Power Point Presentation	Online Transaction Scenarios

Week 9	Lecture 42	Database Transaction Processing(concurrency control)	T-1 R-1	RW-1 RW-5 RW-25	Lock Based Protocols, Deadlock Handling, Timestamp Based Protocol, 2PL	Understand about maintaining the database consistency in case of concurrent execution through various protocols	Discussion using Power Point Presentation	Online Transaction Scenarios
	Lecture 43	Database Transaction Processing(recoverability)	T-1 R-1 R-4	RW-24	Recovery Algorithm (Log Based Recovery- Immediate DB Modification and Deferred DB Modification, Checkpoints, Shadow Paging), Practice MCQ	Learn about recovering the database to a consistent state that existed prior to the occurrence of the failure	Discussion using Power Point Presentation	ATM Transaction Scenarios
	Lecture 44	Database Transaction Processing(recoverability)	T-1 R-1 R-4	RW-24	Recovery Algorithm (Log Based Recovery- Immediate DB Modification and Deferred DB Modification, Checkpoints, Shadow Paging), Practice MCQ	Learn about recovering the database to a consistent state that existed prior to the occurrence of the failure	Discussion using Power Point Presentation	ATM Transaction Scenarios
	Lecture 45	Database Transaction Processing(recoverability)	T-1 R-1 R-4	RW-24	Recovery Algorithm (Log Based Recovery- Immediate DB Modification and Deferred DB Modification, Checkpoints, Shadow Paging), Practice MCQ	Learn about recovering the database to a consistent state that existed prior to the occurrence of the failure	Discussion using Power Point Presentation	ATM Transaction Scenarios
Week 10	Lecture 46				Test - Code based 2			
	Lecture 47	Programming Constructs in Databases(flow control statements)	T-1 R-1 R-3 R-4	RW-23	Basics of Programming Constructs in Databases, Control Statements including conditional as well as iterative	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
	Lecture 48	Programming Constructs in Databases(flow control statements)	T-1 R-1 R-3 R-4	RW-23	Basics of Programming Constructs in Databases, Control Statements including conditional as well as iterative	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
	Lecture 49	Programming Constructs in Databases(functions, stored procedures)	T-1 R-1 R-3 R-4	RW-10	Subprograms like Procedures, Stored Procedure and Functions	Understand about the programming constructs like functions stored procedures	Live Demonstration	Programming Problems

Week 10	Lecture 50	Programming Constructs in Databases(cursors)	T-1 R-1 R-3 R-4	RW-10	Cursors and its types, Problems on Cursors	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
Week 11	Lecture 51	Programming Constructs in Databases(cursors)	T-1 R-1 R-3 R-4	RW-10	Cursors and its types, Problems on Cursors	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
	Lecture 52	Programming Constructs in Databases(triggers)	T-1 R-1 R-3 R-4	RW-10	Triggers, parts of trigger, types of triggers	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
	Lecture 53	Programming Constructs in Databases(triggers)	T-1 R-1 R-3 R-4	RW-10	Triggers, parts of trigger, types of triggers	Students will learn about the basics of programming constructs in database system	Live Demonstration	Programming Problems
	Lecture 54	Programming Constructs in Databases(exception handling)	T-1 R-3 R-4	RW-6 RW-7 RW-23	Exception Handling (What are Exceptions?), Problems on Exception handling, Practice MCQ	Students will learn about Handling error condition in the program	Live Demonstration	Programming Problems
	Lecture 55	Programming Constructs in Databases(exception handling)	T-1 R-3 R-4	RW-6 RW-7 RW-23	Exception Handling (What are Exceptions?), Problems on Exception handling, Practice MCQ	Students will learn about Handling error condition in the program	Live Demonstration	Programming Problems
Week 12	Lecture 56	File Organization and Trends in Databases(file organizations and its types)	T-1 R-1	RW-8 RW-9 RW-22 RW-36	Heap File organization, Sequential File Organization etc	Learn about the data storage structures and File Organization	Discussion using Power Point Presentation	File organization on Magnetic and optical disks
	Lecture 57	File Organization and Trends in Databases(file organizations and its types)	T-1 R-1	RW-8 RW-9 RW-22 RW-36	Heap File organization, Sequential File Organization etc	Learn about the data storage structures and File Organization	Discussion using Power Point Presentation	File organization on Magnetic and optical disks
	Lecture 58	File Organization and Trends in Databases (indexing, types of indexing)	T-1 R-1	RW-22	Indexes and its types, Sparse Index, Dense Index, Primary Indexes, Secondary Indexes and Clustered Indexes	Students will learn about the use of indexes in databases and its applications	Live Demonstration and discussion	Indexes on Employee database/ University database

Week 12	Lecture 59	File Organization and Trends in Databases (indexing, types of indexing)	T-1 R-1	RW-22	Indexes and its types, Sparse Index, Dense Index, Primary Indexes, Secondary Indexes and Clustered Indexes	Students will learn about the use of indexes in databases and its applications	Live Demonstration and discussion	Indexes on Employee database/ University database
	Lecture 60	File Organization and Trends in Databases (hashing, hashing techniques)	T-1 R-1 R-4	RW-22	Static Hashing and Dynamic Hashing	Learn about the data storage structures, data access techniques and hashing	Discussion using Power Point Presentation	Insert or deletion operations on any table using hashing
Week 13	Lecture 61	File Organization and Trends in Databases (hashing, hashing techniques)	T-1 R-1 R-4	RW-22	Static Hashing and Dynamic Hashing	Learn about the data storage structures, data access techniques and hashing	Discussion using Power Point Presentation	Insert or deletion operations on any table using hashing
	Lecture 62				BYOD-Practical			
	Lecture 63	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	
	Lecture 64	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	
	Lecture 65	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	

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Week 14	Lecture 66	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	
	Lecture 67	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	
	Lecture 68	File Organization and Trends in Databases (introduction to big data, nosql systems)	T-1 R-1 R-4	RW-21 RW-37	Introduction to NoSQL, NoSQL Database Types, Introduction to Big Data, Practice MCQ	Students will learn about the Difference between the SQL, NoSQL and Big data encompassing a wide variety of different database technologies developed in response to a rise in the volume of data	Discussion using Power Point Presentation	

SPILL OVER

Week 0	Lecture 0				Spill Over			
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Scheme for CA:

CA Category of this Course Code is:C010102 (Total 3 tasks, 1 compulsory and out of remaining 1 best out of 2 to be considered)

Component	Iscompulsory	Weightage (%)	Mapped CO(s)
BYOD-Practical	Yes	50	CO1, CO2, CO5
Test - Code based 1	NO	50	CO1, CO2
Test - Code based 2	NO	50	CO3, CO4

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
BYOD-Practical	To test the querying approach and skill set of the student	Lab. evaluation on contents covered from week1 (lecture 1) to week12 (lecture 60)	Individual	Online	100	12 / 13
Test - Code based 1	To check the understanding as well as performance of the students based upon the concepts taught	Code based smartly designed problems on topics covered from week 1 to week 4 and Test questions should be in the multiples of 5	Individual	Online	30	4 / 5
Test - Code based 2	To check the understanding as well as performance of the students based upon the concepts taught	Code based smartly designed problems on topics covered from week 5 to week 9 and Test questions should be in the multiples of 5	Individual	Online	30	9 / 10

MOOCs/ Certification etc. not-mapped with the Academic Task(s) (Available for students for better learning/ will get students ready for)

Name Of Certification/Online Course/Test/Competition mapped	Type	Offered By Organisation
GATE	Test/Examination	GATE