MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN

Department of Information Technology

Name of the Subject	Database Management Systems	Name of the handling Faculty	M
Subject Code	CS3492	Year / Sem	
Acad Year	2022-2023	Batch	

Course Objective

To learn the fundamentals of data models, relational algebra and SQL

To represent a database system using ER diagrams and to learn normalization techniques

To understand the fundamental concepts of transaction, concurrency and recovery processing

To understand the internal storage structures using different file and indexing techniques which will help in physical DB design

To have an introductory knowledge about the storage and Query processing techniques

Course Outcome

Construct SQL Queries using relational algebra

Construct SQL Queries using relational algebra

Construct SQL Queries using relational algebra

Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database

Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.

Lesson Plan

Sl. No.	Topic(s)	T / R* Book	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Le L
	UNIT I INTRODUCTION				
1	Purpose of database system	T1	1	PPT	L
2	View of data	T1	1	PPT	L
3	Data models	T1	1	PPT	L
4	Database System Architecture	T1	1	PPT	L1,
5	Introduction to relational database	T1/W1	1	PPT	L
6	Relational model	T1/W1	1	PPT	L1,
7	Keys	T1/W1	1	PPT	L1,L
8	Relational Algebra	T1/W1	1	PPT	L2,
9	SQL fundamentals	T1/W1	1	PPT	L

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10	Advanced SQL features	**T1**	**1**	**PPT**	**L2,**
11	Embedded SQL	**T1**	**1**	**PPT**	**L**
12	Dynamic SQL	**T1**	**1**	**PPT**	**L**

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method:

UNIT II DATABASE DESIGN

13	Entity-Relationship model	**T1**	**1**	**PPT/BB**	**L**
14	E-R Diagrams	**T1**	**1**	**PPT/BB**	**L2,**
15	Enhanced-ER Model – ER-toRelational Mapping	**T1**	**1**	**PPT/BB**	**L2.**
16	Functional Dependencies – Non-loss Decomposition	**T1**	**1**	**PPT/BB**	**L2.**
17	First, Second, Third Normal Forms	**T1/W1**	**1**	**PPT/BB**	**L2,**
18	Dependency Preservation – Boyce/Codd Normal Form	**T1**	**1**	**PPT/BB**	**L2,**
19	Multi-valued Dependencies and Fourth Normal Form	**T1**	**1**	**PPT/BB**	**L2,**
20	Join Dependencies and Fifth Normal Form	**T1**	**1**	**PPT/BB**	**L2,**

Suggested Activity: Assignment / Case Studies /Seminars/ Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any
normalization to check whether the given relation and table is in normal form or not.

Evaluation method:

UNIT III TRANSACTIONS

25	Transaction Concepts – ACID Properties	**T1**	**1**	**PPT/BB**	**L1,**
26	Schedules-Serializability	**T1**	**1**	**PPT/BB**	**L1,**
27	Transation Support in SQL-Need for Concurrency	**T1/W2**	**2**	**PPT/BB**	**L**
28	Concurrency Control-Two Phase Locking	**T1**	**1**	**PPT/BB**	**L**
29	Time Stamp-Multiversion and snapshot isloation	**T1**	**1**	**PPT/BB**	**L**
30	Multiple Granularity locking -Deadlock Handling	**T1/W2**	**1**	**PPT/BB**	**L**
31	Recovery Concepts-Recovery based on deferred and immediate update	**T1**	**1**	**PPT/BB**	**L**
32	Shadow paging-ARIES Algorithm	**T1**	**1**	**PPT/BB**	**L**

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method:

UNIT IV IMPLEMENTATION TECHNIQUES

37	RAID-File Organization	**T1**	**1**	**PPT/BB**	**L1,**

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38	Organization of Records in Files-Data Dicionary storage	**T1**	**1**	**PPT/BB**	**L**
39	Column oriented storage-Indexing and Hashing	**T1**	**1**	**PPT/BB**	**L**
40	Ordered indices-B+ tree Index files-Static Hashing	**T1/W1**	**2**	**PPT/BB**	**L1,**
41	Dynamic Hashing-Query Processing Review	**T1**	**1**	**PPT/BB**	**L1,**
42	Algorithms for Selection	**T1**	**1**	**PPT/BB**	**L1,**
43	Sorting and Join Operations	**T1**	**1**	**PPT/BB**	**L2,**
44	Query optimization using Heuristics -Cost Estimation.	**T1**	**1**	**PPT/BB**	**L**

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any 1 As
Hashing and JOINS

Evaluation method:

UNIT V ADVANCED TOPIC

49	Distributed Databases: Architecture-Data Storage	**T1**	**1**	**PPT/BB**	**L1,**
50	Transaction Processing-Query Processing&optimization	**T1**	**1**	**PPT/BB**	**L1,**
51	NOSQL Databases-CAP Theorem	**T1/W1**	**1**	**PPT/BB**	**L1,**
52	Document Based Systems-Key Value Stores	**T1**	**1**	**PPT/BB**	**L1,**
53	Column Based Systems-Graph Databases	**T1**	**1**	**PPT/BB**	**L1,**
54	Database Security-Security issues-	**T1**	**1**	**PPT/BB**	**L1,**
55	Access Control Based on Privileges-Role based access control	**T1/W2**	**1**	**PPT/BB**	**L1,**
56	SQL Injection-Flow Control-Challenges	**T1**	**2**	**PPT/BB**	**L1,**

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any 1. A

Evaluation method:

Content Beyond the Syllabus Planned

1	JDBC connectivity using databases.
2	

Text Books

1	Abraham Silberschatz, Henry F. Korth, S.Sudharshan, - Database System Concepts, Sixth Edition, Tata McGraw Hill,2011
2	Ramez Elmasri, Shamkant B. Navathe, - Fundamentals of database systems, Sixth Edition, Pearson Education, 2011

Reference Books

1	C.J. Date, A.Kannan, S.Swamynathan, - An Introduction to Databse system, Elighth Edition, Pearson Edition, 2006
2	Raghu Ramakrishnan, - Database Management System, Fourth Edition, McGraw-Hill College Publications,2015
3	G.K Gupta , Database Management Systems, Tata McGraw Hill, 2011

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Website / URL References	
1	https://www.brainkart.com/subject/Database-Management-Systems_380/
2	https://www.slideshare.net/OECLIBOdishaElectron/database-management-system-ppt

Blooms Level

Level 1 (L1) : Remembering **Level 2 (L2) : Understanding** **Level 3 (L3) : Applying**	Lower Order Thinking	Fixed Hour Exams	**Level 4 (L4) : Analysing** **Level 5 (L5) : Evaluating** **Level 6 (L6) : Creating**

Mapping syllabus with Bloom's Taxonomy LOT and HOT

Unit No	Unit Name	L1	L2	L3	L4	L5	L6
Unit 1	Relational DataBases	3	12	3	0	0	0
Unit 2	Database design	0	8	**7**	**0**	**0**	**0**
Unit 3	Transactions	3	7	**0**	**0**	**0**	**0**
Unit 4	Implementation Techniques	6	6	**1**	**0**	**0**	**0**
Unit 5	Advanced topic	8	8	**0**	**0**	**0**	**0**
Total		20	41	11	0	0	0
Total Percentage		27.7778	56.9444	15.2778	0	0	0

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	3	_	_	_	_	_	_	_
CO2	3	3	3	3	_	_	_	_	_	_	_
CO3	3	3	1	3	_	_	_	_	_	_	_
CO4	3	2	1	1	_	_	_	_	_	_	_
CO5	3	3	2	2	_	_	_	_	_	_	_
Avg	3	3	3	3	_	_	_	_	_	_	_

Justifications for CO-PO Mapping

CO1	Database concepts like relational algebra, SQL Queries are used in design and understanding the complex problem
CO2	Student will follow the design to implement fromE-R Diagram to relational tables.
CO3	Investigation of database concept like transaction will help students to solve different problems.
CO4	Identify and analyse indexing strategies in different database
CO5	Identify and analyse advanced database techniques

3	High level	2	Moderate level	1

Name & Sign of Faculty Incharge : Viswajaa . S

Name & Sign of Subject Expert :

Head of the Department :

Format No :231

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[rs. Viswajaa		
II/IV		
2021-2025		
vel (L1-6)	**CO**	**PO**
2	CO1	PO3
2	CO1	PO3,PO4
2	CO1	PO3,PO4
,L2	CO1	PO3
2	CO1	PO4
,L2	CO1	PO1,PO4
2,L3	CO1	PO1
,L3	CO1	PO1,PO4
2	CO1	PO3

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,L3	CO1	PO3,PO4
2	CO1	PO3
2	CO1	PO3
2	CO2	PO3,PO4
,L3	CO2	PO3,PO4
L3	CO2	PO1,PO3
,L3	CO2	PO1,PO2
,L3	CO2	PO1,PO3
,L3	CO2	PO2,PO3
,L3	CO2	PO2,PO3
,L3	CO2	PO1,PO2
1 Assignments on		
,L2	CO3	PO2
,L2	CO3	PO1,PO2
1	CO3	PO2,PO3
2	CO3	PO2
2	CO3	PO2,PO4
2	CO3	PO2,PO4
2	CO3	PO2
2	CO3	PO1,PO2
,L2	CO4	PO4

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1	CO4	PO4
1	CO4	PO2
,L2	CO4	PO1,PO2
,L2	CO4	PO1,PO2
,L2	CO4	PO1,PO4
,L3	CO4	PO1,PO4
2	CO4	PO3,PO4
ssignments on Extensible		
,L2	CO5	PO2
,L2	CO5	PO4
,L2	CO5	PO2,PO4
,L2	CO5	PO2,PO4
,L2	CO5	PO2,PO4
,L2	CO5	PO2,PO4
,L2	CO5	PO1,PO3
,L2	CO5	PO1,PO4
ssignments on Xquery		

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	Higher Order Thinking	Projects / Mini Projects
LOT	HOT	**Total**
18	0	18
15	0	15
10	0	10
13	0	13
16	0	16
72	0	72
100	0	100
PO12	**PSO1**	**PSO2**
_	2	2
_	2	3
_	2	2
_	2	2
_	2	2
_	2	2

Low level

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