MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	**Computer Science and Engineering**		
Course Name	Database systems (DBS)	Course Code	CSE 2251
Semester	IV	Curriculum	2018
Name of the faculty	Dr. ROOPALAKSHMI R	Academic year	2022-23
No. of Contact Hours/Week	L T P C: 2 1 0 3		

COURSE OUTCOMES (CO'S)

At the end of this course, the student should be able to:		**No. of Hours**	**Marks**
CO1	Understand the basic concepts of database and relational model	7	30
CO2	Apply structured query language for data retrieval	8	28
CO3	Use and design databases using E-R models	4	10
CO4	Analyze and apply the normalization technique to decompose given relational schema into effective schemas	6	20
CO5	Explain the method of indexing, hashing and organization of files and apply the different transaction properties for serializability and recovery algorithm.	11	12
Total hours/ Marks		**36**	**100**

In semester & End semester plan and schedule (AY: 2022-23)

Component	Type	Max. Marks	Syllabus: Topics covered during	Schedule	Blooms taxonomy levels
MISAC 1	Surprise Assignment	5	Jan 30 – Feb 11, 2023	Feb13-17, 2023	4
MISAC 2	Quiz	5	Jan 30 – Feb 25, 2023	Feb 27-Mar 04, 2023	2 to 4
MISAC 3	In-semester Exam 1	15	Jan 30 – Mar 04, 2023	Mar 10-13, 2023	2 to 6
FISAC 1	(B) Surprise Assignment	5	Mar 04- Apr 01, 2023*	Mar 27-Apr 01, 2023	4
MISAC 4	In semester Exam 2	15	Mar 06- Apr 14, 2023	Apr 18-20, 2023	2 to 6
FISAC 2	(A) Quiz / MCQ	5	Topics covered after MISAC 4	May 02-08, 2023	2 to 4
END Semester examination		50	L1 – L36	May 22-Jun 03,2023	2 to 6

MISAC – Mandatory In semester Assessment Components

FISAC – Flexible In semester Assessment components

FISAC 1/2 should be different

***Topics covered under FISAC 1 may vary depending on the assessment type chosen**

Blooms Taxonomy Level – FISAC 1 & 2			
No	**FISAC Components**	**First year**	**Higher semester**
A	QUIZ/MCQs	Same as MISAC 2 (2 to 6)	
B	Surprise Assignment	3	Same as MISAC 3 (4)
C	Take home assignment	3	4
D	Group Assignment	4	5
E	Seminar	4	5
F	Quiz based on invited talks	4	5
G	Development of SW/Apps	4	5
H	Mini Project	4	5

LESSON PLAN

Lecture No.	Topic	CO's addressed
L0	Overview of subject and syllabus discussion.	CO1
L1	Database-System Applications, Purpose of Database Systems, View of Data, Database Languages. Relational Databases	CO1
L2	Database Design, Data Storage and Querying, Transaction Management	CO1
T1	Database Architecture, Database Users and Administrators, NoSQL, Sharding.	CO1
L3	Structure of Relational Databases, Database Schemas, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.	CO1
L4	Relational Algebra –Fundamental Operations	CO1
L5	Additional Relational Algebra Operations, Extended Relational Algebra Operations	CO1
T2	Problems on Relational Algebra	CO1
L6	SQL Data Definition, SQL Data Types and Schemas, Integrity Constraints	CO2
L7	Structure of SQL Queries, Additional Basic Operations	CO2
T3	Set Operations, Null Values	CO2
L8	Aggregate Functions.	CO2
L9	Nested Subqueries.	CO2
T4	Continuation of Nested Subqueries.	CO2
L10	Modification of the Database, Join Expressions.	CO2
L11	Views, Transactions.	CO2
L12	Overview of the Design Process, The Entity-Relationship Model, Constraints.	CO3
T5	Removing Redundant Attributes in Entity Sets, Entity- Relationship Diagrams.	CO3
T6	Entity-Relationship Design Issues, Extended E-R Features.	CO3
L13	Reduction to Relational Schemas.	CO3
L14	Features of Good Relational Design, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies.	CO4
L15	Functional Dependency Theory	CO4
T7	Problems on finding attribute closure and canonical cover.	CO4
L16	Algorithms for Decomposition.	CO4
T8	Problems on decomposition and dependency preservation check	CO4

L17	Decomposition using Multivalued Dependences	CO4
L18	File Organization , Organization of Records in Files	CO5
L19	Indexing: Basic Concepts, Ordered Indices	CO5
T9	B + Tree Index Files	CO5
L20	B+ Tree Extensions, Multiple-Key Access	CO5
T10	Static Hashing	CO5
L21	Dynamic Hashing, Comparison of Ordered Indexing and Hashing.	CO5
L22	Transaction Management: Transaction Concept, A simple Transaction model, Transaction Atomicity and Durability	CO5
T11	Transaction Isolation, Serializability	CO5
L23	Transaction Isolation and Atomicity, Transaction Isolation Levels	CO5
L24	Recovery and Atomicity	CO5
T12	Recovery Algorithm	CO5

References:

References	
1	Silberschatz, Korth, Sudarshan, "Database System Concepts", 6th Edition, McGrawHill,New York, 2011.
2	Ramez Elmasri and Shamkant Navathe, Durvasula V L N Somayajulu, Shyam K Gupta, "Fundamentals of Database Systems", 6th Edition,Pearson Education, United States of America,2011.
3	Pramod J Sadalage, Martin Fowler, NoSQL Distilled, Addison-Wesley, 2013
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Submitted by:
Name of the faculty
Dr ROOPALAKSHMI R

(Signature of the faculty)
Date: 04/03/2023
Approved by:

(Signature of HOD)

Date: 04/03/2023

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY NAME	SECTION	FACULTY NAME	SECTION
Dr ANUP BHAT B	A & B	Dr SUCHARITHA SHETTY	C
Dr ROOPALAKSHMI R	D		

COURSE PLAN – ADDITIONAL DETAILS

At the end of this course, the student should be able to:		No. of contact Hours	Marks	Program outcomes (PO's)	Learning outcomes (LO's)	PSO	BL
CO1	Understand the basic concepts of database and relational model	10	30	1,2,3,8	1	1,2,4	2
CO2	Apply structured query language for data retrieval	8	28	1,2,3,8,9	2	1,2,4	2,3
CO3	Use and design databases using E-R models	4	10	1,2,3,7,8	5	1,2,4	2,3,4,5
CO4	Analyze and apply the normalization technique to decompose given relational schema into effective schemas	6	20	1,2,3,8	2	1,2,4	2,3,4
CO5	Explain the method of indexing, hashing and organization of files and apply the different transaction properties for serializability and recovery algorithm.	11	12	1,2,3,8	1	1,2,4	2,3,4
Total hours/ Marks		**36**	**100**				

Course Articulation Matrix (NBA)

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CSE2251.1	2	1	1					1					3	1		1
CSE2251.2	2	2	1				1	1					3	1		1
CSE2251.3	1	2	3				1	1					3	1		1
CSE2251.4	2	1	3					1					3	1		1
CSE2251.5	2	2	2					1					3	1		1
Average Program Articulation Level	**2**	**2**	**2**				**0**	**1**					**3**	**1**		**1**

IET – Course Learning Outcomes (CLO's) mapping with AHEP LO's

Course Learning Outcome	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
CSE2251.1	✓																	
CSE2251.2		✓																
CSE2251.3					✓													
CSE2251.4		✓																
CSE2251.5	✓																	

Abbreviations

1. **CO – Course outcome**
2. **PO – Program outcome**
3. **PSO – Program Specific outcome**
4. **LO – Learning outcome**
5. **CLO – Course Learning outcome**
6. **BL – Blooms Taxonomy**
7. **AHEP – The Accreditation of Higher Education Programmes**