MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL
(A constituent unit of MAHE., Manipal)

COURSE PLAN

Department :	INFORMATION AND COMMUNICATION TECHNOLOGY			
Course Name & code :	DATABASE SYSTEMS		ICT 2177	
Semester & branch :	IV SEMESTER	B.TECH CCE		
Name of the faculty :	DR. Diana Olivia, Dr. Suminth N and Prof. Akshay K C			
No of contact hours/week:	L	T	P	C
	3	0	0	3

COURSE OUTCOMES (COS)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks	Program Outcomes (POs)	PSO	BL (Recommended)
CO1	Demonstrate the understanding of database concepts.	2	6	1		3
CO2	Apply procedural and non-procedural language constructs to manage database system	13	36	1,2,3,5	2	3, 4
CO3	Design database using data modelling tool and normalization concept	11	30	1,2,3,5	2	3, 4
CO4	Comprehend the transaction management and concurrency control concepts.	7	20	1,2,3,5		3
CO5	Interpret the unstructured databases	3	8	1,3,5		3
	Total	36	100			

*** COURSE LEARNING OUTCOMES (CLOS)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks	Program Outcomes(POs)	Learning Outcomes (LOs)	BL (Recommended)
CLO1	Demonstrate the understanding of database concepts.	2	6	1	1	3
CLO2	Apply procedural and non-procedural language constructs to manage database system	13	36	1,2,3,5	1, 2, 3	3, 4
CLO3	Design database using data modelling tool and normalization concept	11	30	1,2,3,5	1,2,3	3,4

CLO4	Comprehend the transaction management and concurrency control concepts.	7	20	1,2,3,5	**1,2,3**	3
CLO5	Interpret the unstructured databases	**3**	**8**	1,3,5	**1,2,3**	3
	Total	36	100			

*** Applicable to programs applied for IET accreditation only.

Assessment Plan

IN – SEMESTER ASSESSMENTS

S. No.	Assessment Mode		Assessment Method	Time Duration	Marks	Weightage	Typology of Questions (Recommended)	Schedule	**Topics Covered
1	MISAC	1	In-semester Exam 1	60 Mins	15	**Objective: 5M** 10 MCQs × ½ = 5 marks **Descriptive: 10 M** (2 Questions of 2 marks +2 Questions of 3 marks)	Bloom's taxonomy (B) level of the question should be L3 and above.	March , 2023	Introduction, Database users, Database architecture, Relational database, Keys, Schema, Formal relational query language, SQL basics, Constraints
		2	Quiz	15 Mins	5	10 MCQs × ½ = 5	Bloom's taxonomy (BT) level of the question should be L3 and above.	Feb 2023	Introduction, Database users, Database architecture, Relational database, Keys, Schema, Formal relational query language, SQL basics, Constraints, Intermediate SQL
		3	Surprise Assignment	20 Mins	5	1 Question × 5M = 5 marks (Minimum 5 questions to be given)	Bloom's taxonomy (BT) level of the question should be L3 and above.	Feb 2023	Modification of the Database, Intermediate SQL, Advanced SQL

	4	In-semester Exam 2	60 Mins	15	**Objective:** 5M 10 MCQs × ½ = 5 marks **Descriptive:** 10 M (2 Questions of 2 marks +2 Questions of 3 marks)	Bloom's taxonomy (BT) level of the question should be L3 and above.	April 2023	Advanced SQL, Database design and ER model, Relational database design
2	FISAC	1	Quiz	20 mins	5	***	Bloom's taxonomy (BT) level of the question should be L3 and above.	April 2023
		2	**Take home assignment**	***	5	***	Bloom's taxonomy (BT) level of the question should be L3 and above.	May 2023

END – SEMESTER ASSESSMENT

1	Regular/Make–Up Exam	180 Mins	50	Answer all 5 full questions of 10 marks each. Each question can have 3 parts of 2/3/4/5/6 marks.	Bloom's taxonomy (BT) level of the question should be L3 and above.	17th week of the semester	Comprehensive examination covering full syllabus.

** *Individual faculty will be entering the topics*

*** *Individual faculty must identify the assessment method from table 3 and fill in the details.*

<u>**NOTE:**</u> *Information provided in the table is as per the In-semester assessment plan and schedule of V and VII semester B. Tech provided from Academic Section.*

Flexible In-semester Assessment Component (FISAC):

i) The FISAC 1 & FISAC 2 may be any of the types given in Table 1. However, tne two components should be of different type.

ii) The type of assessment should be informed to the students well in advance.

iii) Syllabus for the last component of In-semester Assessment (ISAC) i.e. FISAC 2 should cover the topics mentioned for self-study if any / topics which are not covered till MISAC 4: In-Semester Exam 2.

Table 1: Flexible In-semester Assessment Component (FISAC)

No	Type	Description
A.	Quiz/MCQs	Same as MISAC 2: Quiz/MCQs
B.	Surprise Assignment	Same as MISAC 3: Surprise assignment.
C.	Take Home Assignment	*10 questions are to be given to each student. *Questions must be of Blooms Taxonomy Level 3 for first year and Level 4 for higher semesters. *Questions are to be given TWO weeks in advance. *Students have to write the answers to all the questions.
D.	Group Assignment	*The students are to be grouped in such a way that there are 3 – 4 students in each group. *Each group is to be given one question. *The questions should be of Blooms Taxonomy Level 4 for first year and Level 5 for higher semesters. *Questions are to be given TWO weeks in advance. *The questions may be in the form of case studies, design, report writing, etc.
E.	Seminar	*Students may be given the topics for seminar relevant to the course of study. *Topics are to be given TWO weeks in advance. *Should be of Blooms Taxonomy Level 4 for first year and Level 5 for higher semesters. *Topics should be related to the courses of study. *Topics should be in the field of recent developments in the courses of study. *Students have to collect the data regarding the seminar topic and submit a report. *Students should make a presentation for about TEN minutes using Power Point.
F.	Quiz / Assignment based on invited talks	*Faculty have to arrange for the invited talk in the emerging areas in the courses of study. *Quiz / Assignment is to be conducted on the topic of the invited talk. *Questions should be at Blooms Taxonomy Level 4 for first year and Level 5 for higher semesters.
G.	Development of Software / Apps	*Faculty has to define the problem statement. *Problem Statements are to be given TWO weeks in advance. *Should be at Blooms Taxonomy Level 4 for first year and Level 5 for higher semesters. *Students have to develop the software / mobile apps using the appropriate software language / platform.
H.	Mini Project	*Faculty has to define the problem statement. *Problem Statements are to be given TWO weeks in advance. *Should be at Blooms Taxonomy Level 4 for first year and Level 5 for higher semesters. *Students have to develop prototypes.

LESSON PLAN

L No	TOPICS	Course Outcome Addressed
1	Introduction, Characteristics of the database approach, actors on the scene	CO1
2	Advantages of using a DBMS.	CO1
3	Relational Databases: Structure of Relational Database, Database schema, Keys	CO2
4	Schema Diagrams	CO2
5	Relational Query Languages, Relational Operations	CO2
6	Introduction to SQL: Overview of the SQL Query Language, SQL data definition, Basic structure of SQL Queries	CO2
7	Additional basic operations, Set Operations	CO2
8	Null values, Aggregate functions	CO2
9	Nested sub-queries	CO2
10	Modification of the database	CO2
11	Intermediate SQL : Join expressions, Transactions, Views	CO2
12	Integrity Constraints, SQL Data Types, schemas, Authorization	CO2
13	Introduction to PL/SQL, cursors	CO2
14	Functions and procedures	CO2
15	Triggers, Recursive queries	CO2
16	Database Design and ER model:Overview of the design process, The Entity Relationship model	CO3
17	Constraints, Removing redundant attributes in the entity sets	CO3
18	Entity relationship diagrams, ER design issues, Extended ER features	CO3
19	Relational database design: Features of good relational design	CO3
20	Atomic domains and first normal form (NF)	CO3
21	Decomposition using functional dependencies	CO3
22	Functional dependency theory	CO3
23	2NF, 3NF	CO3
24	BCNF	CO3
25	Algorithms for decomposition.	CO3
26	Decomposition using multivalued dependencies	CO3
27	Transaction Management: Transaction concept, A simple transaction model, Storage structure	CO4
28	Transaction Atomicity and durability, Transaction isolation	CO4
29	Serializability, Transaction isolation and atomicity	CO4
30	Transaction isolation levels, Implementation of isolation levels, Transactions as SQL statements	CO4
31	Concurrency Control: Lock Based protocols, deadlock handling	CO4
32	Multiple granularity, Timestamp based protocols	CO4
33	Validation based protocols	CO4
34	Introduction to NoSQL, RDBMS vs NoSQL	CO5
35	CAP Theorem, Types of NoSQL database	CO5
36	basics of MongoDB.	CO5

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2														
CO2	3	3	3		2									2	
CO3	3	3	3		2									2	
CO4	2	2	2		1										
CO5	2		2		2										
Articulation Level	2.4	2.66	2.5		1.75									2	

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

FACULTY	SECTION	FACULTY	SECTION
Dr Diana Olivia	CCE-A	Dr. Sumith N	CCE-C
Prof. Akshay K C	CCE-B		

References:
1. Abraham Silberschatz, Henry Korth F., Sudarshan S., "Database system concepts (6e)", McGraw-Hill, 2013
2. Elmasri, Ramez, Sham Navathe, "Fundamentals of database systems (7e)", Pearson, 2016
3. Molina, Hector, Jeffrey Ullman D., Jennifer Widom, "Database systems, The Complete Book (2e)", Pearson Prentice Hall, 2013
4. Chodorow Kristina, "MongoDB: The definitive guide (2e)", O'Reilly, 2013.

Submitted by: Dr. Diana Olivia

(Signature of the faculty)

Date: 05/03/2023

Approved by: Dr. Smitha N Pai

(Signature of HOD)

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