# MANIPAL INSTITUTE OF TECHNOLOGY
## Manipal University, Manipal
### Karnataka -576104

## COURSE PLAN

| | | |
|---|---|---|
| **Department** | : | Information and Communication Technology |
| **Course Name & code** | : | DATABASE SYSTEMS   (ICT 3154) |
| **Semester & branch** | : | 5th Semester,   CCE (B.Tech.) |
| **Name of the faculty** | : | Mrs. Diana Olivia and Mr. Sirish Shetty B |
| **No of contact hours/week:** | 03 Hours | |

## ASSESSMENT PLAN:

1. **In Semester  Assessments  -  50 %**

- Written tests  : Two Tests of 15 Marks each (Max. Marks 30)

- Assignment/Quiz/ Seminar  : A1: Analytical based Test for 6M, A2: Conceptual based Open-Book Test for 6M and A3: Application based Group Task for 8M.

2. **End Semester Examination  -  50 %**

- Written examination of 3 hours duration (Max. Marks: 50 )

| Portions for Assignment/Quiz/Seminar etc.... | |
|---|---|
| **Sl. no.** | **Topics/Lessons** |
| 1 | L0  - L12 |
| 2 | L13 - L24 |
| 3 | L02 - L26 |
| 4 | |
| 5 | |
| **Portions for Sessional Test** | |
| **Test no.** | **Topics/Lessons** |
| 1 | L0 - L14 |
| 2 | L15 - L28 |

## Course Outcomes (COs)

*At the end of this course, the student should be able to:*

|  |  | No. of Contact Hours | Program Outcomes (POs) addressed |
|---|---|---|---|
| CO1: | Familiarize the database concepts and structures | 02 | |
| CO2: | Design database using conceptual data model | 17 | |
| CO3: | Understand data management using the concepts of transaction | 09 | |
| CO4: | Illustrate the working of procedural and non-procedural language | 09 | |
| CO5: | | | |
| CO6: | | | |

## Course Plan

| L. No. | Topics | Course Outcome Addressed |
|---|---|---|
| L0 | Database and database Users: Introduction, Characteristics of the database approach | CO1 |
| L1 | Actors on the scene, advantages of using a DBMS | CO1 |
| L2 | Relational Databases: Structure of Relational Database, Database schema, Keys | CO2 |
| L3 | Schema Diagrams | CO2 |
| L4 | Relational Query Languages, Relational Operations | CO4 |
| L5 | Introduction to SQL: Overview of the SQL Query Language, SQL data definition, Basic structure of SQL | CO4 |
| L6 | Additional basic operations | CO4 |
| L7 | Set operations | CO4 |
| L8 | Null values, Aggregate functions | CO4 |
| L9 | Nested sub-queries | CO4 |
| L 10 | Modification of the Database | CO2 |
| L11 | Intermediate SQL: Join expressions, Transactions, Views | CO4 |
| L12 | Integrity Constraints, SQL Data Types | CO2 |

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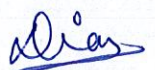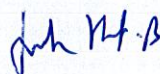| L. No. | Topics | Course Outcome Addressed |
|---|---|---|
| L 13 | schemas, Authorization | CO2 |
| L 14 | Advanced SQL:<br>Accessing SQL from a programming language, Functions and Procedures, Triggers | CO4 |
| L 15 | Recursive queries, Advanced aggregation features, OLAP | CO4 |
| L16 | Database Design:<br>Overview of the design process, The Entity Relationship model | CO2 |
| L 17 | Constraints, Removing redundant attributes in the entity sets | CO2 |
| L18 | Entity relationship diagrams , Reduction of ER to relations | CO2 |
| L19 | ER design issues, Extended ER features | CO2 |
| L 20 | Relational database design:<br>Features of good relational design | CO2 |
| L 21 | Atomic domains and first normal form (NF) | CO2 |
| L 22 | Decomposition using functional dependencies | CO2 |
| L23 | Functional dependency theory | CO2 |
| L 24 | 2NF, 3NF and BCNF | CO2 |
| L25 | Algorithms for decomposition | CO2 |
| L 26 | Decomposition using multivalued dependencies | CO2 |
| L27 | Transaction Management:<br>Transaction concept, A simple transaction model, Storage structure | CO3 |
| L 28 | Transaction Atomicity and durability, Transaction isolation | CO3 |
| L29 | Serializability | CO3 |
| L 30 | Transaction isolation levels, Implementation of isolation levels, Transactions as SQL statements | CO3 |
| L31 | Concurrency Control:<br>Lock Based protocols, deadlock handling | CO3 |
| L32 | Multiple granularity, Timestamp based protocols, Validation based protocols | CO3 |
| L33 | Recovery System:<br>Failure classification, Storage, recovery and atomicity | CO3 |
| L 34 | Recovery algorithm | CO3 |
| L 35 | Types of DBMS<br>Object-oriented and object-relational databases, logical databases, web databases, distributed databases | CO3 |
| L 36 | More problems on Database design | CO2 |
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| L. No. | Topics | Course Outcome Addressed |
|--------|--------|--------------------------|
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**References:**

| No. | |
|-----|--|
| 1. | Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw Hill International Edition, Sixth Edition, 2013 |
| 2. | Ramez Elmasri, Shamkant B Navathe, "Fundamentals of Database Systems", Addision Wesley Punblications, Sixth Editon, 2013 |
| 3. | C. J. Date, "An Introduction to Database Systems", Addision Wesley Publication, Eight edition, 2003 |
| 4. | |
| 5. | |
| 6. | |
| 7. | |

**Submitted by:**   Mrs. Diana Olivia          Mr. Sirish Shetty B
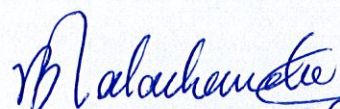
**(Signature of the faculty)**

**Date:** 28/07/2017

**Approved by:** Dr. Balachandra

Dr. Balachandra
Professor & Head
Dept. of Information &
Communication Technology
M.I.T., Manipal - 576 104

**(Signature of HOD)** 28/7/17

**Date:** 28/07/2017

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

| FACULTY | SECTION | FACULTY | SECTION |
|---|---|---|---|
| Mr. Sirish shetty B | A | | |
| Mrs. Diana Olivia | B | | |
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