**ARMY INSITUTE OF TECHNOLOGY**

**Department of computer Engg.**

**LESSON PLAN**

**Subject** : Database Management Systems **Teaching Scheme:**

**Class** : TE Comp (A) Sem I (2020-21) Lectures:3Hrs/week

**Staff**  : Ms. Rushali Patil

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| **Sr.No** | **Unit** | **Topic** |
| 1 | I | **Introduction**  Introduction to Database Management Systems |
| 2 | Purpose of Database Systems |
| 3 | View of Data, Database Languages |
| 4 | Database System Structure, Data Models |
| 5 | Database Design and ER Model |
| 6 | Entity, Attributes, Relationships, Constraints, Keys, Design  Process |
| 7 | Entity Relationship Model, ER Diagram, Design Issues |
| 8 | Extended E-R Features |
| 9 | Converting E-R & EER diagram into tables |
| 10 | II | **SQL AND PL/SQL**  SQL: Characteristics and advantages, SQL Data Types and Literals |
| 11 | DDL, DML, DCL, TCL, SQL Operators, Tables: Creating, Modifying, Deleting |
| 12 | Views: Creating, Dropping, Updating using Views, Indexes |
| 13 | SQL DML Queries: SELECT Query and clauses, Set Operations, Predicates and Joins, Set membership, Tuple Variables, Set comparison, Ordering of Tuples, Aggregate Functions |
| 14 | Nested Queries, Database Modification using SQL Insert, Update and  Delete Queries |
| 15 | PL/SQL: concept of Stored Procedures & Functions, Cursors |
| 16 | Triggers, Assertions, roles and privileges |
| 17 | Embedded SQL, Dynamic SQL |
| 18 | III | **Relational Database Design**  Relational Model: Basic concepts, Attributes and Domains, CODD's Rules |
| 19 | Relational Integrity: Domain, Referential Integrities, Enterprise Constraints |
| 20 | Database Design: Features of Good Relational Designs |
| 21 | Normalization, Atomic Domains and First Normal Form |
| 22 | Decomposition using Functional Dependencies |
| 23 | Algorithms for Decomposition, 2NF |
| 24 | 3NF, BCNF |
| 25 | Modeling Temporal Data |
| 26 | IV | **Database Transactions and Query Processing**  Basic concept of a Transaction, Transaction Management |
| 27 | Properties of Transactions |
| 28 | Concept of Schedule, Serial Schedule |
| 29 | Serializability: Conflict and View, Cascaded Aborts |
| 30 | Recoverable and Non-recoverable Schedules |
| 31 | Concurrency Control: Need, Locking Methods, Deadlocks |
| 32 | Timestamping Methods, Recovery methods : Shadow-Paging and Log-Based Recovery |
| 33 | Checkpoints, Query Processing, Query Optimization, Performance Tuning |
| 34 | V | **Parallel and Distributed Databases**  Introduction to Database Architectures: Multi-user DBMS Architectures |
| 35 | Case study- Oracle Architecture |
| 36 | Parallel Databases: Speedup and Scale up, Architectures of Parallel Databases |
| 37 | Distributed Databases: Architecture of Distributed Databases |
| 38 | Distributed Database Design, Distributed Data Storage |
| 39 | Distributed Transaction: Basics, Failure modes |
| 40 | Commit Protocols, Concurrency Control in Distributed Database |
| 41 | VI | **NoSQL Database**  Introduction to NoSQL Database, Types and examples of NoSQL Database |
| 42 | Key value store, document store, graph, Performance |
| 43 | Structured verses unstructured data, Distributed Database Model |
| 44 | CAP theorem and BASE Properties |
| 45 | Comparative study of SQL and NoSQL |
| 46 | NoSQL Data Models |
| 47 | Case Study-unstructured data from social media |
| 48 | Introduction to Big Data |
| 49 | HADOOP: HDFS, MapReduce |

Rushali Patil Prof Dr. S.R. Dhore

**Subject Incharge HOD (Comp Dept.)**