**Lesson Plan**

**Name of Faculty :** Ved Parkash, Assistant Professor

**Discipline :** Computer Science & Engineering

**Semester :** 3rd CSE

**Subject :** Data Structure Theory & Practical

**Lesson Plan Duration:** 15 weeks

Work Load (Lectutre/Practical) per week (in hours): **Lectures 03 hours, Practical 03 hours**

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| **Week** | **Theory** | **Practical** |
| Lecture Day |  |  |
| 1st | 1 | **Introduction to Data Structures**, Data Types, Built in and User Defined Data Structures, Applications of Data Structure | Write a program for Binary serach methods. |
| 2 |  Algorithm Analysis, Worst, Best and Average Case Analysis |
| 3 | Notations of Space and Time Complexity |
| 2nd | 4 | **Arrays**, One Dimensional Arrays, Two Dimensional Arrays and Multi-Dimensional Arrays | Write a program for insertion sort, selection sort and bubble sort |
| 6 | Sparse Matrices, Storage Class, Basics of Recursion.  |
| 7 | Searching from array using Linear and Binary Searching Algorithm, Sorting of array using Selection, |
| 3rd | 9 | Insertion, Bubble, Radix Algorithm  | Write a program to implement Stack and its operation |
| 10 | **Stacks**: Definition, Implementation of Stacks and Its Operations |
| 11 |  Evaluation of Infix, prefix and Postfix Expression, Inter-conversion of Infix Expression, Prefix and Post-Fix Expression |
| 4th | 13 | Implementation of Merge Sort and Quick Sort Algorithm. | Write a program for quick sort. |
| 14 | **Queues**: Definition, Sequential Implementation of Linear Queues and Its Operations |
| 15 | Circular Queue and Its Implementation, Priority Queues and Its Implementation, Applications of queues. |
| 5th | 17 | **Linked Lists**: Dynamic Implementations, Need of Dynamic Data Structures | Write a program for merge sort |
| 18 | Single Link List and Its Dynamic Implementation, Traversing, Insertion |
| 19 | Deletion Operations on Single Link Lists. Comparison between Static and Dynamic, Implementation of Linked List |
| 6th | 21 | Dynamic Implementation of Stacks and Queues | Write a program to implement Queue and its operation |
| 22 | Circular Link Lists |
| 23 | Students Query |
| 7th | Minor Test |  |
| 8th | 25 | Doubly Link List | Write a program to implement Circular Queue and its operation. |
| 26 | Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List. |
| 27 | Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List. |
| 9th | 29 | **Trees**: Definition, Basic Terminology, Binary Tree | Write a program to implement singly linked list for the following operations: Create, Display, searching, traversing and deletion |
| 30 | External and Internal Nodes, Static and Dynamic Implementation of a Binary Tree |
| 31 | Primitive Operations on Binary Trees |
| 10th | 33 | Binary Tree Traversals: Per-Order | Write a program to implement doubly linked list for the following operations: Create, Display, inserting, counting, searching, traversing and deletion |
| 34 | In-Order |
| 35 | Post-Order Traversals |
| 11th | 37 | Representation of Infix, Post-Fix and Prefix Expressions using Trees | Write a program to implement circular linked list for the following operations: Create, Display, inserting, counting, searching, traversing and deletion. |
| 38 | Introduction to Binary Search Trees |
| 39 | B trees, B+ trees |
| 12th | 41 | AVL Trees | Write a program to implement circular linked list for the following operations: Create, Display, inserting, counting, searching, traversing and deletion. |
| 42 | Threaded Binary trees |
| 43 | Balanced Multi-way search trees |
| 13th | 45 | Implementation of Heap Sort Algorithm | Write a program to implement insertion, deletion and traversing in B tree |
| 46 | **Graphs**: Basic Terminology, Definition of Undirected & Directed Graphs |
| 47 | Memory Representation of Graphs, |
| 14th |  | Minor Test |  |
| 15th | 49 | Minimum-Spanning Trees, | Write a program to implement warshall algorithm |
| 50 | Warshal Algorithm |
| 51 | Graph Traversals Algorithms: Breadth First and Depth First |

**Lesson Plan**

**Name of Faculty :** Ved Parkash, Assistant Professor

**Discipline :** Computer Science & Engineering

**Semester :** 5th ECE

**Subject :** Essential of IT

**Lesson Plan Duration:** 15 weeks

Work Load (Lectutre/Practical) per week (in hours): **Lectures 03 hours**

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| **Week** | **Theory** |
| **Lecture Day** |  |
| 1st | 1 | Problem Solving Techniques: Introduction to Problem Solving |
| 2 | Introduction to Algorithms and Flowchart |
| 3 | Searching algorithms: Linear search |
| 2nd | 4 | Binary search and Sorting algorithms |
| 5 | Insertion and |
| 6 | Selection sort |
| 3rd | 7 | Basic Data Structures: Stack |
| 8 | Linear Queue |
| 9 | Programming Basics: Identifiers, Variables, Data Types |
| 4th | 10 |  Operators |
| 11 | Control Structures: Loop, If else, Nested If |
| 12 | Switch Statement, Arrays |
| 5th | 13 | Strings,. Object Oriented Concepts |
| 14 | Class & Object, Operator |
| 15 | Instance Variables & Methods |
| 6th | 16 | Access Specifiers, Reference Variables |
| 17 | This, Super, Parameter Passing Techniques |
| 18 | Constructors, Static , and Command Line Arguments |
| 7th | Minor test |
| 8th | 19 | Relationships: Inheritance, Types of Inheritance |
| 20 | Static Polymorphism |
| 21 | Method Overloading |
| 9th | 22 | Constructor Overloading |
| 23 | Method Overriding |
| 24 | Abstract, Interface |
| 10th | 25 | Introduction to Packages |
| 26 | Query |
| 27 | RDBMS- Data Processing |
| 11th | 28 | Database Technology, Data Models |
| 29 | Data Independence |
| 30 | ER Modeling Concept |
| 12th | 31 | ER-notations |
| 32 | Converting ER Diagram into Relational Schema |
| 33 | Definition of Keys: Primary key, Foreign key, Unique Key |
| 13th | 34 | SQL |
| 35 | DDL Statements |
| 36 | DML Statements |
| 14th | Minor test |  |
| 15th | 37 | DCL Statements |
| 38 | Joins |
| 39 | Sub queries, Views |