

## LESSON PLAN- DS

**Name of Faculty** : Ms. Priyanka Sachdeva  
**Discipline** : Computer Science Engg.  
**Semester** : B.Tech 3<sup>rd</sup> Semester  
**Subject** : Data Structure  
**Lesson plan duration** : 15 Weeks  
**Work Load (Lecture/Practical) Per Week (in hours):** Lecture - 03, Tutorial-1, Practical – 03

| Week | Theory      |   | Practical     |   |
|------|-------------|---|---------------|---|
|      | Lecture day | Topic (Including assignment and test)   | Practical Day | Topic                                     |
| 1    | 1           | Data Types, Built in and User Defined Data Structures, Applications of Data Structures            | 1             | Write a program for Binary Search method. |
|      | 2           | Algorithm Analysis, Worst, Best and Average Case Analysis, Notations of Space and Time Complexity |               |   |
|      | 3           | One Dimensional Arrays  |               |   |
| 2    | 4           | Two Dimensional Arrays Multi-Dimensional Arrays   | 2             | Write a program for insertion sort        |
|      | 5           | Sparse Matrices   |               |   |
|      | 6           | Storage Class, Basics of Recursion  |               |   |
| 3    | 7           | Searching from array using Linear search  | 3             | Write a program for selection sort        |
|      | 8           | Binary Search algorithm   |               |   |

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|   | 9  | Sorting of array using Selection, Bubble                                  |   |   |
| 4 | 10 | Insertion Sort, Radix Sort  | 4 | Write a program for bubble sort                       |
|   | 11 | Class Test  |   |   |
|   | 12 | Definition, Implementation of Stacks and Its Operations                   |   |   |
| 5 | 13 | Evaluation of Infix, prefix and Postfix Expression                        | 5 | Write a program to implement stack and its operation. |
|   | 14 | Inter-conversion of Infix Expression, Prefix and Post-Fix Expression      |   |   |
|   | 15 | Implementation of Merge Sort  |   |   |
| 6 | 16 | Implementation of Quick Sort  | 6 | Write a program for quick sort.                       |
|   | 17 | Definition, Sequential Implementation of Linear Queues and Its Operations |   |   |
|   | 18 | Circular Queue and Its Implementation                                     |   |   |
| 7 | 19 | Priority Queues and Its Implementation, Applications of queues            | 7 | Write a program for merge sort.                       |
|   | 20 | Definition, Implementation of Stacks and Its Operations                   |   |   |
|   | 21 | Evaluation of Infix, prefix and Postfix Expression                        |   |   |
| 8 | 22 | Class Test  | 8 | Write a program to implement Queue and its operation  |
|   | 23 | Dynamic Implementations, Need of Dynamic Data Structures                  |   |   |
|   | 24 | Single Link List  |   |   |

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|    |    | and Its Dynamic Implementation  |    |   |
| 9  | 25 | Traversing, Insertion, Deletion Operations on Single Link Lists                               | 9  | Write a program to implement Circular Queue and its operation.  |
|    | 26 | Comparison between Static and Dynamic, Implementation of Linked List                          |    |   |
|    | 27 | Circular Link Lists and Doubly Link List  |    |   |
| 10 | 28 | Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List. | 10 | Write a program to implement doubly linked list for the following operations: create, display, inserting, counting, searching, traversing and deletion.   |
|    | 29 | Dynamic Implementations, Need of Dynamic Data Structures                                      |    |   |
|    | 30 | Single Link List and Its Dynamic Implementation   |    |   |
| 11 | 31 | Traversing, Insertion, Deletion Operations on Single Link Lists                               | 11 | Write a program to implement singly linked list for the following operations: create, display, searching, traversing and deletion.                        |
|    | 32 | Comparison between Static and Dynamic, Implementation of Linked List                          |    |   |
|    | 33 | Circular Link Lists and Doubly Link List  |    |   |
| 12 | 34 | Class Test  | 12 | Write a program to implement circular linked list for the following operations: create, display, inserting, counting, searching, traversing and deletion. |
|    | 35 | The principle sources of optimization, loop optimization                                      |    |   |
|    | 36 | Definition, Basic   |    |   |

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|    |    | Terminology,<br>Binary Tree,<br>External and<br>Internal Nodes  |    |  |
| 13 | 37 | Representation of<br>Infix, Post-Fix and<br>Prefix Expressions<br>using Trees                                       | 13 | Write a program to implement<br>insertion in b tree  |
|    | 38 | Introduction to<br>Binary Search<br>Trees   |    |  |
|    | 39 | B trees, B+ trees   |    |  |
| 14 | 40 | AVL Trees   | 14 | Write a program to implement<br>deletion in b tree   |
|    | 41 | Threaded Binary<br>trees, Balanced<br>Multi-way search<br>trees   |    |  |
|    | 42 | Implementation of<br>Heap Sort<br>Algorithm   |    |  |
| 15 | 43 | Basic<br>Terminology,<br>Definition of<br>Undirected &<br>Directed Graphs,<br>Memory<br>Representation of<br>Graphs | 15 | Write a program to implement<br>traversing in b tree |
|    | 44 | Minimum-<br>Spanning Trees  |    |  |
|    | 45 | Class Test  |    |  |