**LESSON PLAN IT1009 – DATA STRUCTURES AND ALGORITHMS**

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| **Sl. No.** | **No. of**  **Periods** | | **Topics / Sub - Topics** | **Objective** | **Text, Ref**  **Books** |
|  | | **UNIT 1 LINEAR DATA STRUCTURES** | | | |
| 1 | 1 | | Introduction to data structures and algorithms, Types | 1 | TB1, RB1,RB4 |
| 2 | 1 | | List Operations | 1 | TB1, RB1,RB4 |
| 3 | 1 | | Applications, Polynomial Addition etc. | 1 | TB1, RB1,RB4 |
| 4 | 1 | | Stack, operations, Applications- Infix to Postfix Conversion | 1 | TB1, RB1,RB4 |
| 5 | 1 | | Applications contd. Balancing symbols and Function calls, Postfix Evaluation | 1 | TB1, RB1,RB4 |
| 6 | 1 | | Queue, Operations, Applications (job scheduling) | 1 | TB1, RB1,RB4 |
| 7 | 2 | | Performance Analysis | 1,3 | TB1, RB1,RB4 |
|  | | **UNIT 2 TREE DATA STRUCTURE** | | | |
| 9 | 1 | | Basic concepts and terminologies | 1,3 | TB1, RB1,RB4 |
| 10 | 2 | | Binary Tree (Constructions and Operations) | 1,3 | TB1, RB1,RB4 |
| 11 | 2 | | Tree order traversal (Inorder, Preorder and Post order) | 1,3 | TB1, RB1,RB4 |
| 12 | 1 | | Expression tree, Binary Search Tree | 1,3 | TB1, RB1,RB4 |
|  | | **UNIT 3 BALANCED TREE DATA STRUCTURE** | | | |
| 13 | 3 | | Balanced Search Tree, AVL and RBT | 1,3 | TB1, RB1,RB4 |
| 14 | 2 | | Splay Tress, B Trees, Priority Queues | 1,3 | TB1, RB1,RB4 |
|  | | **UNIT 4 SORTING AND HASHING** | | | |
| 15 | 1 | | Shell Sort, Heap Sort | 2 | TB1, RB1,RB4 |
| 16 | 1 | | Quick Sort | 2 | TB1, RB1,RB4 |
| 17 | 1 | | Bucket sort, Radix Sort | 2 | TB1, RB1,RB4 |
| 18 | 2 | | Hashing | 2 | TB1, RB1,RB4 |
|  | | **UNIT 5 GRAPH ALGORITHMS** | | | |
| 21 | 1 | | Introduction, Definition, Representation ,Types | 1 | TB1, RB1,RB4 |
| 22 | 1 | | Shortest Path Algorithm - Dijkstra's algorithm. | 1,3 | TB1, RB1,RB4 |
| 23 | 1 | | Network Flow Problem(With negative edge cost) | 1,3 | TB1, RB1,RB4 |
| 24 | 2 | | Minimum Spanning Tree | 1,3 | TB1, RB1,RB4 |
| 25 | 2 | | Graph Search Method ( BFS and DFS) | 1,3 | TB1, RB1,RB4 |
| 26 | 1 | | Introduction NP Completeness | 1 | TB1, RB1,RB4  ,RB5 |
|  | | **Total No. of Instructional periods available for the course: 60 Hours(Including Lab.)** | | | |

**Text Books**

1.Mark Allen Weiss, Data Structures and Problem Solving using C++, The

Benjamin Cummings/ Addison Wesley Publishing Company, 2007, 3rd Edition.

**Reference Books**

1. Sartaj Sahni, Data Strucutres, Algorithms and Applications in C++, second

edition, University Press,2005.

2. Alfred V. Aho, John E. Hopcoft, Jeffrey D. Ullman, Data Strucutures and

Algorithms, Addision Wesley, 1987

3. Thomas A. Standish, Data Structures, Algorithm and Software Principles in C ,

Addison – Wesley Publishing Company,1st Edition,1994

4. Horowitz Ellis, Sahni Sartaj, Mehta Dinesh, Fundamentals of Data Structures in

C++, 2nd Edition, Silicon Press, 2006

5. Brassard Bratley, Fundamentals of Algorithms,PHI,1996