**ODD 2020 - Lecture Plan**

**15B11CI518–Data Structures & Algorithms**

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| **Lecture #** | **Title of the Module** | **Topics to be Discussed** |
| Lecture#1 | **Introduction** | Introduction to data structures |
| Lecture#2 | Single linked list - creation, traversal, insertion, deletion |
| Lecture#3 |
| Lecture#4 |
| Lecture#5 | Doubly linked list, circular linked list |
| Lecture#6 | Multi linked list |
| Lecture#7 | Applications of multi linked list - sparse matrix representation |
| Lecture#8 | Stack (array and linked list representation) and stack applications |
| Lecture#9 |
| Lecture#10 | Queue (array and linked list representation) and queue applications |
| Lecture#11 |
| Lecture#12 | **Sorting & Searching** | Search: Linear, Binary |
| Lecture#13 | Sort: Insertion, Selection, Bubble |
| Lecture#14 | **Algorithm Complexity** | Abstract data type, Growth of function, Space-Time tradeoffs |
| Lecture#15 | Complexity analysis of algorithms - Asymptotic analysis |
| Lecture#16 | **Searching** | Merge Sort |
| Lecture#17 | Quick sort |
| Lecture#18 | Count Sort |
| Lecture#19 | Bucket Sort |
| Lecture#20 | **Trees** | Introduction to tree data structure, Binary Tree & its operations |
| Lecture#21 |
| Lecture#22 | Binary Search tree & its operations |
| Lecture#23 |
| Lecture#24 | AVL Tree |
| Lecture#25 | AVL Tree- Insertion operation |
| Lecture#26 | AVL Tree-Deletion operation |
| Lecture#27 | **Heaps** | Introduction to heaps |
| Lecture#28 | Binary heap- Insertion and deletion |
| Lecture#29 | **Graphs** | Introduction to graphs, Representation – adjacency list, adjacency matrix |
| Lecture#30 | Traversal – BFS and DFS |
| Lecture#31 | Introduction to Spanning tree & Minimum spanning tree, Spanning tree construction using – Prims |
| Lecture#32 | Spanning tree construction using Kruskal’s algorithm |
| Lecture#33 | **Hashing** | Introduction to hashing, Hash function with examples |
| Lecture#34 | Introduction to Collision resolution - open and closed hashing methods |
| Lecture#35 | Analysis of open and closed hashing methods |
| Lecture#36 | **Algorithms** | Introduction to algorithms and its significance |
| Lecture#37 | Introduction to Backtracking Algorithm (N Queen Problem) |
| Lecture#38 | Introduction to Branch and Bound |
| Lecture#39 | Introduction to Greedy algorithm and Problems on Greedy algorithm (Fractional Knapsack) |
| Lecture#40 | Introduction to Dynamic programming and Problems on Dynamic Programming (Fractional Knapsack,Longest Common Subsequence) |
| Lecture#41 | Graph Algorithms- Shortest path using Dijkstra algorithm |
| Lecture#42 | Graph Algorithms- Shortest path using Floyd–Warshall algorithm |