**Lesson Plan**

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

**Discipline :** Robotics & Artificial Intelligence

**Semester :** M Tech. 1st Semester

**Subject :** Advanced Data Structure Programming

**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 | Data Structures Arrays and Strings |
| 2 | Algorithm Development, Complexity analysis |
| 3 | Recursion, Linear Data Structures, |
| 2nd | 4 | Stacks, |
| 6 | Queues, Circular Queues |
| 7 | Links Lists, Operation – Creations, insertion, Deletion |
| 3rd | 9 | Circular Lists, Doubly Linked List. |
| 10 | Definition, Basic Terminology, Binary Tree, External and Internal Nodes, Static and Dynamic Implementation of a Binary Tree |
| 11 | Primitive Operations on Binary Trees, Binary Tree Traversals: Pre-Order |
| 4th | 13 | In-Order and Post-Order Traversals |
| 14 | Representation of Infix, Post-Fix and Prefix Expressions using Trees |
| 15 | Introduction to Binary Search Trees |
| 5th | 17 | B+ trees |
| 18 | AVL Trees |
| 19 | Threaded Binary trees, Balanced Multi-way search trees |
| 6th | 21 | Implementation of Heap Sort Algorithm |
| 22 | **Graphs**: Basic Terminology, Definition of Undirected and Directed Graphs, |
| 23 | Queries |
| **7th** |  | **Minor Test** |
| 8th | 25 | Memory Representation of Graphs |
| 26 | Minimum-Spanning Trees |
| 27 | Warshal Algorithm |
| 9th | 29 | Graph Traversals Algorithms: Breadth First and Depth First. |
| 30 | Python Programming Introduction, gitHub, Functions |
| 31 | Booleans and Modules, Sequences |
| 10th | 33 | Iteration and String Formatting, Dictionaries |
| 34 | Sets, and Files, Exceptions |
| 35 | Testing, Comprehensions, Advanced Argument Passing |
| 11th | 37 | Lambda -- functions as objects, Object Oriented Programming |
| 38 | Object Oriented Programming |
| 39 | Queries |
| 12th | 41 | More OO -- Properties, Special methods, |
| 42 | Iterators, Iterables, and Generators, Decorators |
| 43 | Context Managers, Regular Expressions, and Wrap Up. |
| 13th | 45 | JavaScript Basics, Functional programming |
| 46 | Object oriented programming, Client-side applications |
| 47 | Queries |
| **14th** |  | **Minor Test** |
| 15th | 49 | Server-side applications |
| 50 | Design patterns and Idioms |
| 51 | Popular frameworks and Queries |