

| P.I.E.T.                   | P.I.E.T. Samalkha  |                               | Lecture Plan  |         |
|----------------------------|--|-------------------------------|---|---------|
| Year: Aug-Dec 2021         |  | Semester : 3 <sup>rd</sup>    |   |         |
| Subject Code : IT-PC-205 A |  | Subject Name : Data Structure |   |         |
| Lecture No                 | Topic  | Test/Assignment no            | Referred Book   | Remarks |
| L-1                        | <b>UNIT-1</b> Data structure-definition, basics, types of data structure, abstract data type Overview-array, queue, stack, linked list, searching, sorting, graph, tree. |                               | 1.Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH<br><br>2.Data structure through c By G.S Baluja<br><br>3.Data Structure using C By Tanenbaum |         |
| L-2                        | Static & dynamic implementation, examples & real life application.   |                               |   |         |
| L-3                        | Built-in & user defined data structure, Ordered list & operations on it.   |                               |   |         |
| L-4                        | Array- definition, implementation, Lower bound, upper bound  |                               |   |         |
| L-5                        | Addressing an element at a particular index for one dimensional array, two dimensional array   |                               |   |         |
| L-6                        | multidimensional dimensional array   |                               |   |         |
| L-7                        | Implementation of data structure like structure/record, union.   |                               |   |         |
| L-8                        | Sparse matrix, Implementation of transpose.  | <b>ASSIGNMENT 1</b>           |   |         |
| L-9                        | Stacks- sequential implementation of stack, operation,   |                               |   |         |
| L-10                       | polish notation & evaluation & conversion, application.  |                               |   |         |
| L-11                       | <b>Revision/Test</b>   | <b>TEST 1</b>                 |   |         |
| L-12                       | <b>UNIT-2.</b> Queue- definition, sequential implementation of linear queue, operation,  |                               | 4. Introduction to Data structure in C By Ashok N. Kamthane<br><br>5. Data Structure & Algorithms using c by R.S Salaria  |         |
| L-13                       | circular queue. implementation(using arrays), advantage over linear queue, priority queue & application  |                               |   |         |
| L-14                       | linked list, need for dynamic list, operations on it.  |                               |   |         |
| L-15                       | Singly link list- startup.   |                               |   |         |
| L-16                       | Singly linked list & doubly linked list.   |                               |   |         |
| L-17                       | Dynamic implementation of linked list & problems of all syllabus up to now.  |                               |   |         |
| L-18                       | Doubly linked list.  | <b>ASSIGNMENT 2</b>           |   |         |
| L-19                       | comparison between Array and Dynamic implementation of linked list   |                               |   |         |
| L-20                       | Linked Implementation of stacks and queues   |                               |   |         |
| L-21                       | Circular linked list. & Implementation of primitive operations   |                               |   |         |
| L-22                       | <b>Revision/Test</b>   | <b>TEST 2</b>                 |   |         |
| L-23                       | <b>UNIT-3</b> : Tree : Definition, Basic terminology, binary tree  |                               |   |         |

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| L-24 | Array and Dynamic Implementation of a binary tree, primitive operations on binary tree |                     | 1.Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH<br><br>2.Data structure through c By G.S Baluja |  |
| L-25 | External and internal nodes, Tree traversals- in-order, preorder, post-order.          |                     |  |  |
| L-26 | Representation of Infix , postfix and prefix expressions using tree                    |                     |  |  |
| L-27 | Representation of lists as binary trees, Introduction to Binary Search Trees           |                     |  |  |
| L-28 | Tree- B-tree, B+ tree, balanced tree, threaded tree, basics.                           | <b>ASSIGNMENT 3</b> |  |  |
| L-29 | AVL Trees and balanced multi way search trees  |                     |  |  |
| L-30 | <b>Revision/Test</b>   | <b>TEST 3</b>       |  |  |
| L-31 | <b>UNIT-4:</b> .Graph- directed graph, undirected graph & networks                     |                     | 1.Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH<br><br>2.Data structure through c By G.S Baluja |  |
| L-32 | Basic terminology, Representation of graph, Graph traversals                           |                     |  |  |
| L-33 |  |                     |  |  |
| L-34 | Spanning forests, minimum spanning trees, computer representation of graphs            |                     |  |  |
| L-35 | Tables : Definition Hash functions.  |                     |  |  |
| L-36 | Implementation & Applications  |                     |  |  |
| L-37 | basic searching tech.-(linear & binary search), intro to sorting-insertion, selection  | <b>ASSIGNMENT 4</b> |  |  |
| L-38 | quick, bubble, radix   |                     |  |  |
| L-39 | <b>Revision/Test</b>   | <b>TEST 4</b>       |  |  |
| L-40 | Revision of syllabus   |                     |  |  |