

DSDP-2-02T: Data Structures

Total Marks: 100
 External Marks: 70
 Internal Marks: 30
 Credits: 4
 Pass Percentage: 40%

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| Course: Data Structures | |
| Course Code: DSDP-2-02T | |
| Course Outcomes (COs) | |
| After the completion of this course, the students will be able to: | |
| CO1 | Understand basic data structures such as arrays, linked lists, stacks and queues. |
| CO2 | Understand non-linear data structures like trees and graphs. |
| CO3 | Apply stack for evaluation of arithmetic expressions, and conversion from infix to post fix and recursion. |
| CO4 | Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data. |
| CO5 | Design algorithm in context of space and time complexity and apply asymptotic notation. |

Detailed Contents:

| Module | Module Name | Module Contents |
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| Module 1 | Introduction to Data Structures | Introduction to data structure and algorithm, various phases of algorithms, Pointers, working with pointers, pointers and function, structure, union, classification of data structures Algorithm analysis: Time space trade off algorithms and Big O notation. |
| Module II | Arrays and Linked Lists | Arrays: Introduction, one dimensional and multidimensional arrays, memory representation of arrays, operations on arrays, sparse arrays and sparse matrices and their implementation, Advantages and limitation of arrays. Linked List: Introduction; operation on linked list, circular linked list, doubly linked list, header linked list, implementation of linked list, application of linked lists. |
| Module III | Stacks & Queues | Stacks: Introduction; array representation of stacks, Operation on stacks; Linked representation of stacks, Application of stacks: matching parenthesis, evaluation of arithmetic expressions, and conversion from infix to post fix, recursion. Queues: Introduction, operation on queues, |

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| | | linked representation of queue, Applications of queues, circular queue, memory representation of queues, priority queues, Multiple queues. |
| Module IV | Trees, Graphs and searching & Sorting Algorithms | <p>Trees: Introduction; Binary Tree; Complete Binary Trees, representation of binary trees in the memory, traversing a binary tree, Binary Search Tree, Operations on Binary Search Tree.</p> <p>Graphs: Introduction Graph: Graph terminology, Memory Representation of Graphs: adjacency matrix representation of graphs, adjacency list or linked representation of graphs, graph traversal algorithms.</p> <p>Searching & Sorting Algorithms: Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort</p> |

Books

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| <ol style="list-style-type: none"> 1. A. Tanenbaum, Y. Lanhgsamand A. J. Augenstein, "Data Structures Using C", PHI. 2. Loomis, Marry, "Data Management and File Structures", PHI 3. Seymour Lipschultz, "Theory and Practice of Data Structures", Tata McGraw-Hill. 4. E. Horowitz and S. Sahni, "Data Structures with Pascal", Galgotia. 5. M. J. Folk, B. Zoellick, G Riccardi, "File Structures", Pearson Education. |
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