Data Structure using C

Duration: 36 Hrs.

Data Abstraction and Algorithm Analysis

- Data types/objects/structures
- Abstract definition of data structures
- Representation and implementation
- Time requirements of algorithms
- Space requirements of algorithms

Linear Data Structures

- Array application and representation
  - Polynomials
  - Sparse matrices
  - String-pattern Matching

- Stack and Queues
- Needs and justification of the study of the structures
- Representation and implementation
- Stack using array
- Queue using array
- Polish Notation
- Various types of queue
  - Simple Queue
  - Circular Queue
  - Dequeue
  - Priority Queue

- Implementation of recursion using stack
- Linked Lists
  - Needs for the structure and justification of the study
  - Representation and Implementation
  - Stack and Queue
  - Doubly linked list
  - Circular linked list

- Linked list application
- Memory Management
  - Static memory management
  - Dynamic memory management

Nonlinear Data Structures

- Trees
  - Definitions, terminologies and properties
  - Binary tree representation ,traversals and applications
  - Threaded binary trees
  - Binary Search Trees
  - AVL Trees
  - M-way Search Trees
  - B-trees
  - Reconstruction of Binary Tree

Graphs

- Definition, terminologies and properties
- Graph representations
- Minimum spanning trees
- Depth-first search
- Breadth-first search
- Shortest Path Algorithm
    - Prim's Algorithm
    - Kruskal's Algorithm

Sort and Search Algorithms

- Bubble Sort
- Insertion Sort
- Selection Sort
- Heap sort
- Merge sort
- Quick-sort
- Sequential search
- Binary search