

# PGDCA-06 Data Structure through C Language

## Unit 1 : Introduction to Data Structure

Basic concept of data, data type, Elementary structure, Arrays: Types, memory representation, address translation functions for one & two dimensional arrays and different examples.

## Unit 2 : Algorithms

Complexity, time-Space, Asymptotic Notation.

## Unit 3 : Linked List

Introduction to Linked List , representation of single linked list, linked list operations :Insertion into a linked list, deletion a linked list, searching and traversal of elements and their comparative studies with implementations using array structure.

## Unit 4 : Stacks

Definitions, representation using array and linked list structure, applications of stack.

## Unit 5 : Queues

Definitions, representation using array, linked representation of queues, Circular queues, Deques, Priority queues, application of queue.

## Unit 6 : Searching

Linear and binary search algorithms, other searching algorithms, performance and complexity using big 'O' notation

## Unit 7 : Sorting

Sorting algorithms (Complexity, advantages and disadvantage, implementation), bubble sort, insertion sort, selection sort, quick sort, merge sort, bucket/radix sort.

## Unit 8 : Trees

Definition and implementation : Binary Tree, Tree traversal algorithms (inorder, preorder, postorder), postfix, prefix notations; Binary Search Tree: Searching in BST, insertion and deletion in BST.

## Unit 9 : Graph

Introduction to Graph, Graph representation : adjacency matrix, adjacency list, Traversal of graph : depth first search and breadth first search.

## Suggested Readings:

1. Rajni Jindal, Data structure using C, Umesh Publication
2. HorowitzE, Fundamental of data structure, Galgotia Publications