

CS227 ADVANCED DATA STRUCTURES LAB**Course description and Objectives:**

The fundamental design, and implementation of data structures. Principles for good program design, especially the uses of data abstraction.

Course Outcomes:

At end of this laboratory the student will be able to

- Write well-structured object-oriented programs of medium size of code.*
- Write programs and class libraries given a specification.*
- Students will collaboratively design and then individually implement a robust set of tools to efficiently and elegantly organize data, with optimized access methods.*

List of Programs:

1. Write Java programs that use recursive and non-recursive functions to traverse the given binary tree in
 - a) Preorder
 - b) Inorder
 - c) Postorder.
2. Write a Java program to perform the following operations:
 - a) Construct a binary search tree with given elements.
 - b) Search for a key element in the above binary search tree.
 - c) Delete an element from the above binary search tree.
3. Write Java programs that use both recursive and non-recursive functions for implementing the following searching methods:
 - a) Linear search
 - b) Binary search
4. Write a Java program to implement priority queue ADT.
5. Write Java programs for implementing the following sorting methods:
 - a) Bubble sort
 - b) Insertion sort
 - c) Radix sort
6. Write Java programs for implementing the following sorting methods:
 - a) Quick sort
 - b) Merge sort
7. Write a Java program to implement all the functions of a dictionary (ADT) using Hashing.

8. Write a Java program to perform the following operations:
 - a) Insertion into a B-tree
 - b) Searching in a B-tree
9. Write a Java program that implements KMP algorithm for pattern matching.

REFERENCE BOOKS:

1. A.Drozdek, Data Structures and Algorithms in Java, 3rd edition, Cengage Learning, 2008
2. J.R.Hubbard, Data Structures with Java, 2nd edition, Schaum's Outlines, TMH, 2013.
3. S.Sahani Data structures, Algorithms and Applications in java, 2nd Edition, universities Press, 2009.