# 15CSE374
# INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS

*Sarath tv*

# Syllabus

- Introduction: Overview of Data Structures – A Philosophy of Data Structures - The Need for Data Structures – Cost and Benefits - Abstract Data Types and Data Structures - Principles, and Patterns. Basic complexity analysis – Best, Worst, and Average Cases - Asymptotic Analysis –Analyzing Programs – Space Bounds, Arrays, Linked Lists and Recursion: Using Arrays - Lists - Array based List Implementation – Linked Lists – LL ADT – Singly Linked List – Doubly Linked List –Circular Linked List - recursion- linear, binary, and multiple recursions..

- Stacks and Queues: Stack ADT - Array based Stacks, Linked Stacks – Implementing Recursion using Stacks, Queues - ADT, Array based Queue, Linked Queue, Double-ended queue, Circular queue Trees: Tree Definition and Properties – Tree ADT - Basic tree traversals - Binary tree – Data structure for representing trees – Linked Structure for Binary Tree – Array based implementation. Priority queues: ADT – Implementing Priority Queue using List – Heaps. Maps and Dictionaries: Map ADT – List based Implementation – Hash Tables - Dictionary ADT – Skip List – Complexity.

- Search trees – Binary search tree, AVL tree, Trees – K-D Trees - B-Trees. Sorting and Selection – Linear Sorting – Heap Sort - Divide and Conquer Strategy – Analysis using Recurrence Tree based Method - Merge Sort - Quick Sort - Studying Sorting through an Algorithmic Lens – Selection.

# Text Books

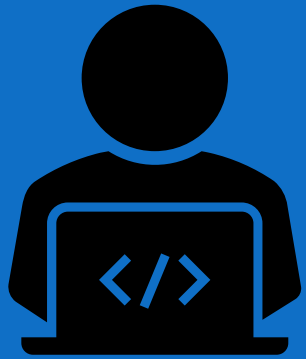- Clifford A. Shaffer, "Data Structures and Algorithm Analysis", Third Edition, Dover Publications, 2012.


Data Structures & Algorithm Analysis in C++
THIRD EDITION
Clifford A. Shaffer
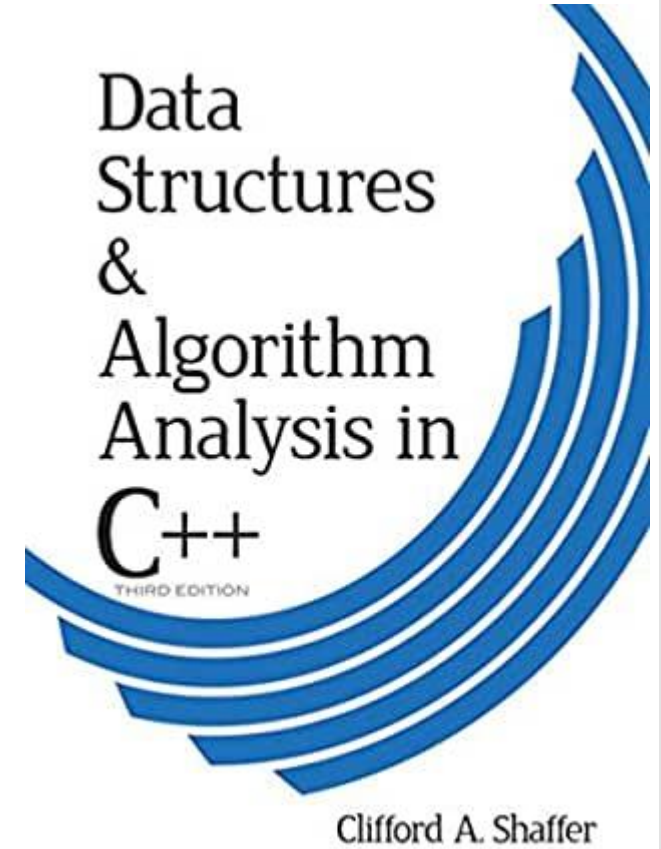
# Evaluations

| Internal :External | P1 and P2 | | CA | ES | |
|---|---|---|---|---|---|
| | Online | VIVA | Theory | Online | Viva |
| 50:50 | 5 | 10 | 20 | 20 | 30 |

Viva weightage -50 (10 +10+30)
CA- Quiz +PA (10+10)

# Course Outcome

| | |
|---|---|
| CO1 | Understand Space and Time Complexities of the algorithm |
| CO2 | Understand Linear and non-Linear data structures |
| CO3 | Understand and apply the basic concepts of sorting and searching algorithms |
| CO4 | Apply data Structures to solve problems |

THANK YOU!!!!!