

Introduction to Data Structures Using C++ Course

Importance of Data Structures

- Core subject in Computer Science Engineering.
- Provides the right way to organize information in the digital space.
- Related with other subjects like Algorithm, DBMS, OS, Data Mining *etc.*
- Placements / Job related opportunities.

Course Learning Outcomes

- **CLO1:** Write recursive algorithms to handle all recursive data structures.
- **CLO2:** Choose appropriate searching and sorting techniques and apply graph algorithms for various practical problems.
- **CLO3:** Formulate new/improved solutions for programming problems using learned data structure.

Assessment Components

Component	Marks
Quiz	10 [Best of n-1 quiz will be considered]
Mid Term	15
End Term	35
Lab Examination	15 [Through Hackathon]
Continuous Lab Evaluation	25 [20 marks Overall Evaluation] + [5 marks Regular Lab Viva]
Total	100

MOOC Courses

- **Udemy:** The Coding Interview Bootcamp: Algorithms + Data Structures
- **Coursera:** Data Structure and Data Science Specialization
- **edX:** Introduction to Data Structures
- **NPTEL:** Data Structure and Algorithms

And others.....

Mid Term Syllabus and Quiz - I

- **Module 1 (Contact hours: 12)**

Introduction to OOPS Concepts, handling Arrays, Tower of Hanoi; Binary search, Time Complexity, Asymptotic Analysis, Big –Oh notation, Solving Recurrence relations. Lists and Implementations: - Linked lists, Recursive functions on lists, Deletion, insertion, reversing, joining.

QUIZ-1 (15 marks) (Probably in Mid September)

- **Module 2 (Contact hours: 12)**

Stacks, Queues using linked lists, handling Polynomials; Tree data structure and Implementations, binary and complete binary trees; Tree traversals algorithms, Binary search trees, insertion and deletion.

Mid Term (15 marks) (Starting from 18/10/21- as declared till date)

Books

- a) A. V. Aho, J. E. Hopcroft, and J. D. Ullman, Data Structures and Algorithms (1 ed.), Pearson, 2002. ISBN 978-8178081021.
- b) Aaron M. Tenenbaum, Y. Langsam and Moshe J. Augenstein, Data Structures Using C (2 ed.), Pearson, 2019. ISBN 978-8131703281
- c) Herbert Schildt, The Complete Reference C++, (4th ed.), Mc Graw Hill, ISBN 978-0-07-053246-5
- d) Cormen, Thomas H., and Thomas H. Cormen. Introduction to Algorithms. Cambridge, Mass: MIT Press, 2001.

For first few weeks, we would learn OOPs (C++) in two classes, Data structure in one class.

Thank You