

ACHARYA NAGARJUNA UNIVERSITY
B.Sc (Computer Science and IT), 2nd Year, IV Semester Syllabus
Paper-IV: DATA STRUCTURES

UNIT I

Concept of Abstract Data Types (ADTs)- Data Types, Data Structures, Storage Structures, and File Structures, Primitive and Non-primitive Data Structures, Linear and Non-linear Data Structures.

Linear Lists – ADT, Array and Linked representations. Arrays – ADT, Mappings, Representations, ADT, Operations Linked Lists: Single Linked List, Double Linked List, Circular Linked List , applications

UNIT II

Stacks: Definition, ADT, Array and Linked representations, Implementations and Applications

Queues: Definition, ADT, Array and Linked representations, Circular Queues, Dequeues, Priority Queues, Implementations and Applications.

UNIT III

Trees: Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications. Binary Search Trees (BST) – Definition, ADT, Operations and Implementations, BST Applications. Threaded Binary Trees,

UNIT IV

Graphs – Graph and its Representation, Graph Traversals, Connected Components, Basic Searching Techniques, Minimal Spanning Trees

UNIT- V

Sorting and Searching: Selection, Insertion, Bubble, Merge, Quick, Sequential and Binary Searching.

REFERENCE BOOKS

1. D S Malik, Data Structures **Using java**, Thomson, India Edition 2006.
2. Sahni S, Data Structures, Algorithms and Applications in java, McGraw-Hill, 2002.
3. SamantaD, Classic Data Structures, Prentice-Hall of India, 2001.
4. Heilman G I,. Data Structures and Algorithms with Object-Oriented Programming, Tata McGraw-Hill. 2002. (Chapters I and 14).
5. Tremblay P, and Sorenson P G, Introduction to Data Structures with Applications, Tata McGraw-Hill,

ACHARYA NAGARJUNA UNIVERSITY
B.Sc (Computer Science and IT) DEGREE EXAMINATION
MODEL PAPER

Second Year –Fourth Semester
Paper: **DATA STRUCTURES**

Time: 3 Hours
Maximum: 75 Marks

SECTION A

Answer any five

(5X15=75)

1. a) What is data structure? Explain its types.
b) What is linked list? Explain different types of linked lists.
2. Write a procedure to insert, delete the elements in single linked list.
3. a) what is a stack. Explain its operations.
b). what is a Queue. Explain its operations
4. Write a program to implement the circular queue operations.
5. a) write a procedure to create the binary search tree.
b) Explain tree traversing teachings.
- 6). a) explain threaded binary tree.
b) What is Tree? And explain representations of tree methods?
7. a) Explain graph representation methods.
b).Explain DFS with example.
8. a) explain Quick sort with example.
b).write a program to implement the binary search.

DATA STRUCTURES USING JAVA LAB

1. Write a Program to implement the Linked List operations
2. Write a Program to implement the Stack operations using an array.
3. Write Programs to implement the Queue operations using an array.
4. Write Programs to implement the Stack operations using a singly linked list.
5. Write Programs to implement the Queue operations using a singly linked list
6. Write a program for arithmetic expression evaluation
7. Write a program to implement Double Ended Queue using a doubly linked list
8. Write a program to search an item in a given list using Linear Search and Binary Search
9. Write a program for Quick Sort
10. Write a program for Merge Sort
11. Write a program on Binary Search Tree operations (insertion, deletion and traversals)
12. Write a program for Graph traversals

Instructions to Question Paper Setters

- Eight Questions are to be set, choosing at least one question from each unit of the syllabus (Maximum 2 questions from each unit)
- All the eight questions carry equal marks (i.e 15 marks for each)
- The candidate has to answer any five questions out of eight, the maximum marks is 75
- The questions must be framed within the scope of the syllabus.