ACHARYA NAGARJUNA UNIVERSITY - UG SYLLABUS

Group: B.Sc Subject: Computer Science Year: I Sem: II

Paper Title: DATA STRUCTURES USING C

UNIT-I:

lntroduction to Data Structures: lntroduction to theTheory of Data Structures, Data Representation Abstract Data Types, Data Types, Primitive Data Types, Data structure and Structured Type, Atomic Type,Difference between Abstract Data types, Data Types, and Data structures Refinement Stages

UNIT - II:

Linked Lists: lntroduction to Lists and Linked Lists, Basic Linked List operations, Doubly Linked List, Circular Linked List, Linked List versus Arrays.

UNIT-III

Stacks: lntroduction to stacks, Stack as an Abstract DataType Representation of stacks through Arrays Representation of Stacks through linked lists, applications of stacks, stacks and recrusion

Queues: lntroduction, Queue as an Abstract data Type, Representation of Queues,Circular queues, double ended queues – Deques, priority queues, Applications of queues.

UNIT-IV

Binary Trees: lntroduction to Non-Linear Data Structures, lntroduction Binary Trees, Types of Trees, Basic Definition of binary trees, properties of binary trees, Representation of binary trees, operations on a Binary search tree, Binary tree traversal, counting number of binary trees, Application of binary trees

UNIT-V

Searching and sorting: Sorting – An lntroduction, Bubble Sort, lnsertion Sort, Merge Sort, searching. An introduction, Linear or Sequential search, binary search, indexed Sequential search.

Graphs: lntroduction to Graphs, Terms Associated with Graphs, sequential Representation of Graphs Linked Representation of Graphs, traversal of graphs, spanning Trees, shortest Path, Application of Graphs

Details of Lab Syllabus: **Data Structures Using C Lab**

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array

a. Add an element at the begging of an array

b. Insert an element at given index of array

c. Update a element using a values and index

d. Delete an existing element

2. Write a program using stacks to convert a given

a. postfix expression to prefix

b. prefix expression to postfix

c. infix expression to postfix

3. Write Programs to implement the Stack operations using an array

4. Write Programs to implement the Stack operations using Liked List.

5. Write Programs to implement the Queue operations using an array.

6. Write Programs to implement the Queue operations using Liked List.

7. Write a program for arithmetic expression evaluation.

8. Write a program for Binary Search Tree Traversals

9. Write a program to implement dequeue using a doubly linked list.

10. Write a program to search an item in a given list using the following Searching Algorithms

a. Linear Search

b. Binary Search.

11. Write a program for implementation of the following Sorting Algorithms

a. Bubble Sort

b. Insertion Sort

c. Quick Sort

12. Write a program for polynomial addition using single linked list

13. Write a program to find out shortest path between given Source Node and Destination Node in a given graph using Dijkstrar's algorithm.

14. Write a program to implement Depth First Search graph traversals algorithm

15. Write a program to implement Breadth First Search graph traversals algorithm