Data Structure Using C

Semester III	Subject Code: BC31602	Lectures: 60

Objectives:

The course is designed to equip students,

- To understand different methods of organizing large amounts of data
- To efficiently implement different data structure
- To efficiently implement solution for different problems
- To get more knowledge on C programming language

Unit 1: Basic Concept of DS and Searching and Sorting Techniques	08

- Basic Concepts
  - Pointers and dynamic memory allocation
  - Algorithm Analysis
  - Space Complexity, Time Complexity, Asymptotic Notation
  - Abstract Data Types (ADT)
  - Polynomial - Polynomial Representation
  - Self Referential Structure
- Searching And Sorting
  - Linear Search
  - Binary Search(Recursive , Non-Recursive)
  - Bubble Sort
  - Insertion Sort
  - Selection Sort
  - Merge Sort

Unit 2: Linked List	10

- Introduction
- Static & Dynamic Representation
- Types of linked List
  - Singly Linked list(All type of operation)
  - Doubly Linked list (Create , Display)
  - Circularly Singly Linked list (Create, Display)
  - Circularly Doubly Linked list (Create, Display)

Unit 3: Stack and Queue	12
• Stack ➢ Introduction stack ➢ Static and Dynamic Representation ➢ Primitive Operations on stack ➢ Application of Stack ➢ Evaluation of postfix and prefix expression ➢ Conversion of expressions- Infix to prefix • Queue ➢ Introduction queue ➢ Static and Dynamic Representation ➢ Primitive Operations on Queue ➢ Circular Queue ➢ DQueue	

Unit 4: Trees and Graphs	12
• Trees ➢ Introduction & Definitions ➢ Terminology of Tree ➢ Static and Dynamic Representation of Tree ➢ Types of tree ➢ Operations on Binary Search Tree ➢ Tree Traversal Inorder, Preorder, Postorder (Recursive & Iterative) • Graphs ➢ Introduction to Graphs ➢ Representation -Adjacency Matrix –List ➢ In degree , out degree of graph using matrix ➢ Graph operation DFS , BFS	

Unit 5: Advanced Data Structures	06
• AVL Trees ➢ AVL Rotations • Spanning Trees ➢ Kruskal's Algorithm to find minimum Spanning Trees • B-Tree ➢ Searching a key in a B-Tree ➢ Advantages of B-Tree Note : No Practical implementation on this chapter	

***Contact hours – 12 hours**

Recommended Text Book:
1. *Data Structure using C*, Alok pawar ,Tech max Publication 2014 2. *Data Structure using C*, Shilpa Pawale, Nirali Prakashan 2014 3. *Data Structure using C*, B.J.Mohite, V.Pawar, A.Sattkar, Vision Publication 2014

Reference Books:
1. Ellis Horowitz and Sartaj Sahni ,*Fundamentals of data structures* 2. Radhakrishanan and Shrivastav ,*Data Structure Using C* 3. Rajesh K. Shukla, Wiley- India, *Data Structure Using C and C++* 4. Abhay K. Abhyankar,*Data Structures Files and Algorithms* Phadke Prakashan. 5. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman,*Data Structures and Algorithms,* PearsonEducation