1. DATA STRUCTURES

Semester	Hours / Week			Total hrs	Credit	Max Marks		
	L	T	P		C	CIE	SEE	TOTAL
II	3	1	0	48	4	40	60	100

MODULE – 1 **Introduction to Data Structures** **9H**

Introduction: Overview of Data Structures, Implementation of Data Structures, Algorithm Specifications, Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off, Arrays.

Searching: Introduction, Basic Terminology, Linear Search and Binary Search Techniques and their complexities.

MODULE -2 **Stacks and Queues** **9H**

Stacks: Introduction, Representation of a Stack, Stack Operations, Applications of Stacks.

Queues: Introduction, Representation of a Queue, Queue Operations, Various Queue Structures: Circular Queue, Double Ended Queue, Priority Queue, Applications of Queues.

MODULE-3 **Linked Lists and Sorting** **10H**

Introduction, Singly linked lists, Doubly Linked Lists, Circular Linked Lists, Linked Stacks and Queues, Applications of Linked Lists.

Sorting: Introduction, Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Quick Sort

MODULE-4 **Trees** **10H**

Introduction, Basic Terminologies, Definition and concepts, Representation of Binary Tree, operations on a BinaryTree, Binary SearchTree, Height balancedBinaryTree, B Trees.

MODULE-5 **Graphs& Hashing** **10H**

Graphs: Introduction, Graph Terminologies, Representation of Graphs, Graph Operations, Shortest Paths, Topological Sorting, Minimum Spanning Trees – Kruskal's and Prim's algorithms.

Hashing: Introduction to Hash Table, Static Hashing, Dynamic Hashing.

Total hours: 48 hours

Text Book(s):

1. **Classic Data Structures**, D. Samanta, 2nd Edition, Prentice-Hall of India, Pvt. Ltd., India, 2012.
2. **Fundamentals of Data Structures in C**, Ellis Horowitz and Sartaj Sahni, 2nd Edition, Universities Press, 2008.

Reference Book(s):

1. Data Structures A Pseudo code Approach with C, Second Edition by Richard F. Gilberg, Behrouz A. Forouzan, Cengage Learning.
2. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu, Radhika Raju Palagiri, Pearson, 2010.
3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, Careermonk Publications, 2016
4. Peter Bras, "Advanced Data Structures", Cambridge University Press, 2014
5. Data Structures, RS Salaria, Khanna Publishing House, 3rd Edition, 2017