

20HS014 DATA STRUCTURES

Hours Per Week :

L	T	P	C
4	-	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
-	-	-	-	-	-	-	-	-

COURSE DESCRIPTION AND OBJECTIVES:

This course is aimed at offering fundamental concepts of data structures and explain how to implement them. It begins with the basic concepts of data, data structures and then introduces the primitive and non-primitive data structures in detail. It forms the basis for understanding various ways of representing data and its usage in different computing applications.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Apply advanced C programming techniques such as pointers, dynamic memory allocation, structures to develop solutions for particular problems.	
2	Analyze characteristics of various data structures.	
3	Differentiate between Graphs and Trees.	
4	Derive the importance of sorting and applying it wherever useful.	
5	Argue the usefulness of data structures in solving problems.	

SKILLS:

✓

✓

UNIT - 1

SORTING AND SEARCHING: Introduction - Data, Data type, Data Structure & its type, Operation On an Array: Insertion, Deletion and searching, Storage structures - Sequential and Linked representations.

SEARCHING: Linear Search, Binary Search

SORTING: Selection Sort, Bubble Sort, Quick Sort

UNIT - 2

LINKED LIST: Introduction, Types of Linked List - Singly Linked List, Doubly Linked List, Circular Linked List; Operations - Insertion, Deletion, Searching, Applications of Linked Lists

UNIT - 3

STACK AND QUEUE: Introduction to Stack, Array Implementation of Stack and Stack applications; Queue: Introduction - Linear Queue, Circular Queue, Array representations of Queue, Applications of Queue.

UNIT - 4

TREE: Introduction, Properties, Binary Tree - Introduction, Properties, Array and Linked Representations, Tree traversals – Pre Order, In Order, and Post Order, BST Definition, and Insert, delete and search operation

UNIT - 5

GRAPH: Introduction, Properties, Directed and Un Directed Graph, Graph Representations - Adjacency matrix, Adjacency list; Traversals - Breadth first search and Depth first search.

TEXT BOOKS:

1. ReemaThareja, "Data Structures Using C", 2nd edition, Oxford University Press, 2014.

REFERENCE BOOKS:

1. Richard F. Gilberg and Bhrouz A. Forouzan, "Data Structures: A Pseudocode Approachwith C", 2nd edition, Cengage Learning, 2004.
2. Jean Paul Tremblay and Paul G. Sorenson, "An Introduction to Data Structures withApplications", 2nd edition, Tata Mc-Graw Hill, 2004.
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd edition, Pearson Education, 2006.