

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering
PRINCIPLES OF DATA STRUCTURES (OPEN ELECTIVE-II)

SYLLABUS FOR B.E. IV-SEMESTER
(COMMON FOR CIVIL & MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U20OE410CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
<ol style="list-style-type: none">1. Understand Basic linear and non-linear data structures and learn techniques of recursion2. Understand concepts of Linked lists3. Understand Concepts of Stacks and queues4. Understand Concepts of Trees5. Understand Concepts of Graphs and different sorting and searching techniques and their complexities.	<ol style="list-style-type: none">1. Understand the basic concepts of data structures.2. Understand the notations used to analyze the performance of algorithms.3. Choose and apply an appropriate data structure for a specified application.4. Understand the concepts of recursion and its applications in problem solving.5. Demonstrate a thorough understanding of searching and sorting algorithms.

UNIT-I

Introduction: Data Types, Data structures, Types of Data Structures, Operations, ADTs, Algorithms, Comparison of Algorithms, Complexity, Time- space tradeoff.

Recursion: Introduction, format of recursive functions, recursion Vs. Iteration, examples.

UNIT-II

Linked Lists: Introduction, Linked lists and types, Representation of linked list, operations on linked list, Comparison of Linked Lists with Arrays and Dynamic Arrays.

UNIT-III

Stacks and Queues: Introduction to stacks, applications of stacks, implementation, and comparison of stack implementations. Introduction to queues, applications of queues and implementations, Priority Queues and applications.

UNIT-IV

Trees: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Representations of Trees, Tree Traversals, Binary search Tree.

UNIT-V

Searching and Sorting: Linear searching, binary Searching, sorting algorithms: bubble sort, selection sort, quick sort, merge sort.

Textbooks:

1. Narasimha Karumanchi, "Data Structures and Algorithms Made Easy", Career Monk Publications, 2017
2. Horowitz E, Sahni S., and Susan Anderson-Freed," Fundamentals of Data structures in C", Silicon Pr; 2 edition (1 August 2007)
3. Reema Thareja, "Data Structures using C", Oxford, 2014.

Reference Books:

1. Kushwaha D. S. and Misra A. K, "Data structures A Programming Approach with C", PHI.
2. Seymour Lipschutz," Data Structures with C", McGraw Hill Education, 2017.

Learning Resources:

1. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
2. <https://www.edx.org/course/foundations-of-data-structures>
3. <https://sites.google.com/site/merasemester/data-structures>

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2	No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>
Duration of Internal Tests		:	1 Hour 30 Minutes			