PVP20

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
(Autonomous)
KANURU, VIJAYAWADA-520007

II B.Tech – I Sem CSE (AI & ML)

Data Structures

Course Code:	20AM3303	**Year:**	II	**Semester:**	I
Course Category:	Engineering Sciences	**Branch:**	CSE(DS, AI&ML)	**Course Type:**	Theory
Credits:	3	**L-T-P:**	3-0-0	**Prerequisites:**	Programming for Problem Solving Using C
Continuous Internal Evaluation:	30	**Semester End Examinations:**	70	**Total Marks:**	100

COURSE OUTCOMES		
Upon successful completion of the course, Student will be able to		
CO1	Understand the classification of various data structures and the algorithm complexity.	**L2**
CO2	Apply suitable searching, sorting algorithms for various applications.	**L3**
CO3	Apply suitable data structure to solve the problems	**L3**
CO4	Analyze the problem to construct an algorithm using suitable data structure	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes &

Strength of correlations (3:High, 2:Medium, 1:Low)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PS01**	**PS01**
CO1	1													
CO2	1													
CO3	3													
CO4		3							1	1		1		

Unit No.	COURSE CONTENTS	Mapped CO
UNIT-1	**Introduction:** Introduction to Data Structures, Basic Terminology, Classification of Data Structures, Operations on Data Structures, Abstract Data Type, Time and Space Complexity. **Sorting and Searching:** Searching- Linear and Binary search algorithms. Sorting- Bubble, Insertion, Selection, Merge, Quick sort algorithms.	**CO1,CO2**
UNIT-II	**Linked lists:** Single linked list, double linked list, circular linked list, and operations on Linked List(Creating, Inserting and Deleting new node, Traversing, Searching)	**CO1,CO3, CO4**
UNIT-III	**Stacks:** Introduction, Array Representation and Implementation, Operations, linked Representation, Operations on a linked stack. **Queues:** Introduction, Array Representation, linked list implementation, Operations	**CO1,CO3, CO4**
UNIT-IV	**Trees:** Introduction- Terminology, representation of trees, binary trees, Properties of binary trees, binary tree representation, binary tree traversals In-order, preorder, post order, Binary search trees Definition, searching BST, insert into BST, delete from a BST.	**CO1,CO3, CO4**
UNIT-V	**Graphs:** Introduction, Terminology, directed graphs, Bi-connected components, Representation of graphs, Graph Traversal Algorithms: Breadth First Search (BFS), Depth First Search (DFS).	**CO1,CO3, CO4**

Learning Resources

Text Books

1. Data Structures Using C, Reema Thareja ,Second Edition, OXFORD University Press

References

1. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Second Edition, 2002, Pearson.
2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Third Edition, 2010, PHI.
3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, 2020, CareerMonk Publications.
4.Fundamental of Data Structures in C, Horowitz, Sahani, Anderson-Freed, Second Edition, 2008, Universities Press.
4. Classic Data Structures, Debasis Samantha, Second Edition, 2009, PHI.

e-Resources and other Digital Material

1. http://cse.iitkgp.ac.in/pds/
2. http://cmpe.emu.edu.tr/bayram/courses/231/LectureNotesSlides/IQBAL/Lecture%20Notes
3. https://www.geeksforgeeks.org/data-structures/
4. https://www.programiz.com/dsa
5. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
6. https://www.youtube.com/watch?v=zWg7U0OEAoE&list=PLBF3763AF2E1C572F
7. https://www.youtube.com/watch?v=S47aSEqm_0I&list=PLgj_VZKxRKrxgFyOutPJpoLFBaQMOpK