Prasad.V.Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada

Data Structures

(Common with CSE)

Course Code	19IT3303	Year	II	Semester	I
Course Category	PC	Branch	IT	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	C Language
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

	Course Outcomes	Blooms Taxonomy Level
	Upon successful completion of the course, the student will be able to	
CO1	Understand the concept of Recursion & Iteration with examples.	L2
CO2	Select appropriate sorting and searching algorithms for various applications.	L3
CO3	Apply appropriate linear data structures to solve problems.	L3
CO4	Solve problems using suitable nonlinear data structures.	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2									1	2	2
CO2	2	2	2									1	2	2
CO3	2	2	2									1	2	2
CO4	2	2	2									1	2	2

Syllabus		
Unit No	Contents	Mapped CO
I	**Introduction:** Algorithm Specification, Time complexity & space complexity and their notations. **Recursion:** What is Recursion, Why Recursion, Format of a Recursive function, Recursion and memory, Recursion Vs Iteration, Examples. **Sorting and Searching:** Searching- Linear and Binary search algorithms, Sorting- Bubble, Insertion, Selection, Merge, Quick sort algorithms.	CO1, CO2
II	**Linked lists:** Single linked list, double linked list, circular linked list, and operations on linked lists.	CO1, CO3
III	**Stacks:** Definition, operations: array implementation, linked list implementation and applications. **Queues:** Definition, operations: array implementation, linked list implementation and applications, Circular Queue.	CO1, CO3
IV	**Trees:** Introduction- Terminology, representation of trees, binary trees abstract data type, 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, Height of a BST.	CO1, CO4
V	**Graphs:** The Graph ADT Introduction, definition, graph representation, elementary graph operations BFS, DFS, Minimum Spanning Tree.	CO1, CO4

Learning Resources
Text Books
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.
References
1. Fundamental of Data Structures in C, Horowitz, Sahani, Anderson-Freed, Second Edition, 2008, Universities Press. 2. Classic Data Structures, Debasis Samantha, Second Edition, 2009, PHI.
e-Resources & 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_V-ZKxRKrxgFyOutPJpoLFBaQMOpK-