

Subject Code : 1CS2020401	Subject Title: DATA STRUCTURE
Pre-requisite :	Fundamental Knowledge of Programming Language 'C'

Course Objective:

This course is intended to develop skills in students to manage data using data structure. Students are expected to learn data manipulation, organize and sorting concepts using data structure. The course aims to make the students to formulate and solve data problem using algorithms and different data structure techniques.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	-	4	5	70	30	30	20	150

Subject Contents			
Sr. No	Topics	Total Hours	Weight (%)
1	Introduction to Data Structure: Introduction Data Structure: Primitive and Non-Primitive Data Structure, Linear and Non-Linear Data Structure. String: Introduction String, String Manipulation – String Length, String copy, String Compare, String Concatenation, string find.	9	20
2	Linear Data Structures: Arrays, Stacks, Queue, Singly Linked List, Circular Linked List, Doubly Linked List, Applications of Linked List, Reverse a List, and Merge a List.	10	20
3	Nonlinear Data Structures : Tree Structure, General Tree, Binary Tree, Tree Traversal Algorithms, Insert & Delete Algorithms, Threaded Tree (Excluding Algorithms), AVL Tree (Excluding Algorithms), Height Balanced Tree (Excluding Algorithms), Weight Balanced Tree (Excluding Algorithms), Graph : Concept, BFS Algorithm, DFS Algorithm .	10	20
4	Sorting: Introduction Sorting: Selection, Bubble, Insertion, Shell, Quick, and Radix. Searching: Introduction Searching, Sequential and Binary Search.	10	20
5	File Organization: Introduction, Sequential, Index, Direct, Inverted Organizations and their applications, Hashing Function and Collision Processing.	9	20

Course Outcomes:

At the end of this course, the student would be able to :

- Understand the concept of Managing Data in organization.
- Use Data Structure algorithms to solve a problem.
- Learn the concept of Linear and Non-Linear Data Structure.
- Learn the basic searching and sorting algorithms.
- Understand File organization.

List of References:

1. An Introduction to Data Structure with Applications , Tremblay J. and Sorenson P., McGraw-Hill international Edition.
2. Introduction to Data Structure, Bhagat singh and Thomas Naps: Tata McGraw-Hill Publishing Co. Ltd., 1985.
3. Expert Data Structure with C, R. B. Patel, Khanna books.
4. Classic Data Structures by Debasis Samanta, PHI Publications.
5. Data Management and File Structures By Mary E. S. Loomis - PHI Publications.

E-Resources / Web Links :

- https://www.tutorialspoint.com/data_structures_algorithms/
- <http://www.studytonight.com/data-structures/>
- <http://www.w3schools.in/category/data-structures-tutorial/>
- <http://cs-fundamentals.com/data-structures/introduction-to-data-structures.php>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. Write a program to implement the concept of Stack using array.
2. Write a program to implement the concept of Queue using array.
3. Write a program to implement the concept of Circular Queue using array.
4. Write a program to implement the concept of Dqueue using array.
5. Write a program to implement the concept of Infix to Postfix.
6. Write a program to implement the concept of Evaluation of Postfix operation.
7. Write a program to implement the concept of Linear Linked list.
8. Write a program to implement the concept of Reverse a Linked List.
9. Write a program to implement the concept of Merge a Linked List.
10. Write a program to implement the concept of Sort a Linked List.
11. Write a program to implement the concept of Double Linked list.
12. Write a program to implement the concept of Binary Tree: Insertion, Deletion, in order Traversal, Pre order Traversal, Post order Traversal.
13. Write a program to implement the concept of Sequential Search.
14. Write a program to implement the concept of Binary Search.
15. Write a program to implement the concept of Bubble Sort.
16. Write a program to implement the concept of Quick Sort.
17. Write a program to implement the concept of Selection Sort.
18. Write a program to implement the concept of Insertion Sort.