Course Code & Name	26CAPL2001 Data Structures Lab		
Teaching Hours /week (L: T:P: R)	0 :0: 4: 0	Credits	2
CIE Marks	50	ESE Marks	50
Course Type	Lab (PLC)	Exam Hours	3
Prerequisites (if any)	26CAPL1001		

Course Objectives:

1. To provide hands-on experience in implementing and applying fundamental data structure operations in C.
2. To provide hands-on experience in implementing and analyzing fundamental searching and sorting algorithms in C.

Course Outcomes (COs)

At the end of the course students should be able to:

CO#	Course Outcomes	Bloom's Knowledge Level (KL)
CO 1	Implement fundamental data structure concepts and operations in C, including array, stack, queue, circular queue, recursion, structures and pointers.	3
CO 2	Implement linear and binary search algorithms, as well as various sorting algorithms in C.	3
CO 3	Implement various types of linked lists, stacks & queues using linked lists and developing proficiency in applying these data structures.	3
CO 4	Implement binary trees in C and effectively display the tree structure and node information to solve problems involving hierarchical data.	3

Note: *K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

CO #	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	3	2	-	-	-
CO 2	3	3	3	3	-	-	-	-
CO 3	3	3	3	3	2	-	-	-
CO 4	3	3	3	2	2	2	2	-

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), - : No Correlation*

Course Assessment Method

(CIE: 50 marks, ESE: 50 marks)

Continuous Internal Evaluation Marks (CIE)

Attendance	Continuous Assessment (Lab Experiments/Project, Viva, Completion of Lab Reports / Project Report)	Internal Lab Examination-1	Internal Lab Examination- 2	Total
8	22	10	10	50 Marks

End Semester Examination Marks (ESE)

Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.

Procedure/ Algorithm/ Flowchart	Conduct of experiment/ Execution of work	Quality of Output	Viva voce	Record	Total
10	15	10	10	5	50 Marks

Continuous Assessment (22 Marks)

1. Conduct of Lab Experiments/Project (12 Marks)
2. Timely Completion of Lab Reports/ Project Reports (5 Marks)
3. Viva Voce (5 Marks)

Final Marks Averaging: The final marks for conduct of experiments, viva, and records are the average of all the specified experiments in the syllabus.

Evaluation Pattern for End Semester Examination (50 Marks)

1. Procedure/Algorithm/Flowchart (10 Marks)
2. Conduct of Experiment/Execution of Work (15 Marks)
3. Quality of Output (10 Marks)
4. Viva Voce (10 Marks)
5. Record (5 Marks)

SYLLABUS

Expt No.	List of Experiment
1	Program to perform the array operations
2	Stack implementation using arrays
3	Postfix expression evaluation - stack application
4	Queue implementation using arrays
5	Circular queue implementation using arrays
6	Linear Search Implementation:
7	Binary Search Implementation:
8	Bubble Sort Implementation:
9	Quick Sort Implementation:
10	Insertion Sort Implementation:
11	Selection Sort Implementation:
12	Merge Sort Implementation:
13	Singly Linked List Implementation:
14	Doubly Linked List Implementation:
15	Circular Linked list Implementation:
16	Stack implementation using linked list
17	Queue implementation using linked list
18	Binary Tree Implementation:
19	Binary Search Tree(BST) Implementation:

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Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition & Year**
1	Data Structures	Reema Thareja	Oxford University Press	3rd Edition 2023
2	Fundamentals of Data Structures in C	Ellis Horowitz, Sartaj Sahni, Susan Anderson Freed.	W.H. Freeman & Co Ltd	2nd Edition 2018

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition & Year**
1	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	MIT Press	3rd Edition 2009
2	Data Structures with C, Schaum's Outlines Series S	Seymour Lipschutz	Tata McGraw Hill	2nd Edition 2014
3	Data Structures	R. Venkatesan, S. Lovelyn Rose	Wiley India Pvt. Ltd. Publications	2nd Edition 2019

Web References/ Video Links (NPTEL, SWAYAM…)	
Sl.No	**Link ID**
1	https://onlinecourses.swayam2.ac.in/nou23_cs13/preview
2	https://nptel.ac.in/courses/106102064
3	https://archive.nptel.ac.in/courses/106/106/106106127/
4	https://archive.nptel.ac.in/courses/106/105/106105085/

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