

Department of Computer Science and Engineering Daffodil International University

Course Code : CSE123 (Batch-64) / CSE134 (Batch-61) **Credit Hours:** 3

Course Title: Data Structure

Course Intended Learning Outcome:

- Apply structural programming approach to solve more complex computation problems
- Demonstrate applications of standard data structures such as linked lists, stacks, queues, trees, and graph
- Solve computation problems using the data structure
- Apply knowledge in development projects based on data structure

Theory Session Plan:

Week No	Topics	Expected Learning Outcome	Assessments (ASSN/CT/Mid/Final)
WK 1	<ul style="list-style-type: none"> • Review discussion on the array, • pointer and structure, 	<ul style="list-style-type: none"> • Perform exercises on the basic array, pointer, and structure 	2/3 problems related to the discussion in the class
WK 2	<ul style="list-style-type: none"> • Discussion on the self-referential structure and dynamic memory allocation 	<ul style="list-style-type: none"> • Solution on computational complexity • Identify the data node from the self-referential structure • Team formation for the course project 	2/3 problems related to the discussion in the class
WK3-WK5	<ul style="list-style-type: none"> • Discussion on linked lists • Singly-linked list • Doubly linked list 	<ul style="list-style-type: none"> • Visualization of the link list • Write code for the designed linked list • Selection of project topic by team 	CLASS TEST 1 (on the last class of the week)
WK6	<ul style="list-style-type: none"> • Discussion on the basic of Stack • Operation of stack 	<ul style="list-style-type: none"> • Basic Idea of the stack and its operation 	None
WK7	<ul style="list-style-type: none"> • Stack application • String application using stack 	<ul style="list-style-type: none"> • Writing code for the processing of expression using stack 	PRESENTATION 1 (student presents the idea of the team project)
WK8	<ul style="list-style-type: none"> • Discussion on the basic of Queue • Operation of Queue 	<ul style="list-style-type: none"> • Problem-solving for expression processing using stack • Writing code for the processing of the queue 	CLASS TEST 2
WK9-WK10	----- midterm week -----	----- midterm week -----	MIDTERM EXAM
WK11	<ul style="list-style-type: none"> • Discussion on Tree data structure 	<ul style="list-style-type: none"> • Implementation of tree data structure 	None
WK12	<ul style="list-style-type: none"> • Tree traversals and applications 	<ul style="list-style-type: none"> • Problem-solving for tree traversal 	2/3 problems related to the discussion in the class
WK13	<ul style="list-style-type: none"> • BST and operations on BST • Applications of BST 	<ul style="list-style-type: none"> • Implementation of BST and related operations • Problem-solving using BST 	PRESENTATION 2 (student present on the design of the project)
WK14	<ul style="list-style-type: none"> • HEAP data structure and applications of Heap 	<ul style="list-style-type: none"> • Implementation of Heap and operations 	2/3 problems related to the discussion in the class
WK15	<ul style="list-style-type: none"> • Basic of AVL Tree and operation 	<ul style="list-style-type: none"> • Understanding the balance factor of the nodes 	None
WK16	<ul style="list-style-type: none"> • Basic Graph, Operation of BFS and DFS 	<ul style="list-style-type: none"> • Implementation of graph data structure 	CLASS TEST 3
WK17-WK18	----- final exam week -----	----- final exam week -----	FINAL EXAM

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Course Code : CSE124 (Batch-64) / CSE135 (Batch-61) **Credit Hours:**1.5 / 1

Course Title: Data Structure Lab

Lab Session Plan:

Week No	Topics	Expected Learning Outcome	Assessments (ASSN/CT/Mid/Final)
WK 1	<ul style="list-style-type: none"> Working with array, pointer, and structure 	<ul style="list-style-type: none"> Write code to implement array, pointer, and structure 	None
WK 2	<ul style="list-style-type: none"> Working with self-referential structure and (dynamic memory allocation) Working on project planning in a team 	<ul style="list-style-type: none"> Write code to implement self-referential structure Plan for the project work 	None
WK3 - WK5	<ul style="list-style-type: none"> Implement linked list and operations on linked list Working with linked list applications Working on the team project 	<ul style="list-style-type: none"> Write code to implement a linked list Plan for the development of the project 	None
WK6	<ul style="list-style-type: none"> Working with the stack Prepare a presentation of the project 	<ul style="list-style-type: none"> Write code to implement applications of the link list 	PRESENTATION 1 (student presents the idea of the team project)
WK7	<ul style="list-style-type: none"> Stack application String application using stack 	<ul style="list-style-type: none"> Writing code for the processing of expression using stack 	None
WK8	<ul style="list-style-type: none"> Working with Queues and applications Work for the team project 	<ul style="list-style-type: none"> Writing code for expression processing using queue 	None
WK9-WK10	---- midterm week ----	---- midterm week ----	MIDTERM EXAM
WK11	<ul style="list-style-type: none"> Working with Tree data structure Working with Tree traversals and applications Working on the team project 	<ul style="list-style-type: none"> Implementation of tree data structure 	None
WK12	<ul style="list-style-type: none"> Tree traversals and applications 	<ul style="list-style-type: none"> Problem-solving for tree traversal 	PRESENTATION 2 (student present on the design of the project)
WK13	<ul style="list-style-type: none"> Working with BST and operations on BST Prepare a presentation of the project 	<ul style="list-style-type: none"> Implementation of BST and related operations 	None
WK14	<ul style="list-style-type: none"> Working with HEAP data structure and applications of Heap Working with the team project 	<ul style="list-style-type: none"> a. Implementation of Heap and operations 	None
WK15	<ul style="list-style-type: none"> Working with the AVL Tree and its operation 	<ul style="list-style-type: none"> Implementation of AVL tree data structure 	PRESENTATION 3 (student present on the implementation of the project)
WK16	<ul style="list-style-type: none"> Working with graph data structure and applications of graph Working with the team project 	<ul style="list-style-type: none"> Implementation of graph data structure 	
WK17-WK18	---- final exam week ----	---- final exam week ----	FINAL EXAM (Lab Assessment)

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Text Book(s):

- Data Structures and Algorithms, Annotated references with example, Granville Barnett, 2008
- Data Structures and Algorithm Analysis in C by Mark Allen Weiss, 2006 (refer time to time)

Reference Material/Book(s):

- Handbook of Data Structures and Applications, Dinesh P. Mehta and Srataj Shani, Chapman and Hall, 2005
- Google search engine