



**UNITED INTERNATIONAL UNIVERSITY**  
Department of Computer Science and Engineering (CSE)  
**Course Syllabus**

**Part A: Introduction**

<b>1</b>	<b>Course Title</b>	Data Structure and Algorithms – I Laboratory
<b>2</b>	<b>Course Code</b>	CSE 2216
<b>3</b>	<b>Pre-requisites</b>	CSE 1112, CSE 1116
<b>4</b>	<b>Course Type</b>	Core Course
<b>5</b>	<b>Credit Hours</b>	1.00
<b>6</b>	<b>Contact Hours</b>	2.5 Hours/Week
<b>7</b>	<b>Semester</b>	4 <sup>th</sup>
<b>8</b>	<b>Total Marks</b>	100
<b>9</b>	<b>Course Instructor's Information</b>	Adiba Shaira Email: adiba@cse.uiu.ac.bd Room: 419
<b>10</b>	<b>Course Rationale</b>	This course has been designed to provide a solid foundation about the data structure and algorithms used in computer science. This course will give insights about the pros and cons of different data structures and algorithms.
<b>11</b>	<b>Course Objectives</b>	The objectives of this course are: <ul style="list-style-type: none"> <li>• To familiarize the basic data structures (array, linked list).</li> <li>• To familiarize complex data structures (queue, stack, priority queue) using basic data structures</li> <li>• To use suitable data structures for different algorithms</li> <li>• To introduce the algorithms and their complexity and use cases</li> </ul>

**Part B: Content of the Course**

12	Course Contents (approved by UGC)	Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort, Linked List: Single Linked List, Double Linked List, Stack: Implementation using Array and Linked List, Queue: Implementation using Array and Linked List, Binary Search Tree: Construction, Operations (Insertion, Deletion, etc.), Graph: Introduction, Implementation using Adjacency Matrix and Adjacency List, BFS, DFS. Tree Traversal(Preorder, Postorder, Inorder)									
13	Course Outcomes (COs)	<table><tr><th>COs</th><th>Description</th></tr><tr><td>CO1</td><td><b>Implement</b> appropriate data structure to handle large datasets efficiently as applied to specified problem definition.</td></tr><tr><td>CO2</td><td><b>Able</b> to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.</td></tr><tr><td>CO3</td><td><b>Able</b> to use linear and non-linear data structures like stacks, queues, linked list etc.</td></tr></table>		COs	Description	CO1	<b>Implement</b> appropriate data structure to handle large datasets efficiently as applied to specified problem definition.	CO2	<b>Able</b> to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	CO3	<b>Able</b> to use linear and non-linear data structures like stacks, queues, linked list etc.
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14	Mapping of COs and Program outcomes										



### Part C: Assessment and Evaluation Methods

Assessment Types	Marks
Attendance	10%
Home Assignments	25%
Coding Tests	30%
Mid Exam	15%
Final Exam	20%

### Grading System

Letter Grade	Marks %	Grade Point	Letter Grade	Marks%	Grade Point
A (Plain)	90-100	4.00	C+ (Plus)	70-73	2.33
A- (Minus)	86-89	3.67	C (Plain)	66-69	2.00
B+ (Plus)	82-85	3.33	C- (Minus)	62-65	1.67
B (Plain)	78-81	3.00	D+ (Plus)	58-61	1.33
B- (Minus)	74-77	2.67	D (Plain)	55-57	1.00
			F (Fail)	<55	0.00

### Part D: Learning Resources

<b>Text Book</b>	1. Introduction to Algorithms – Thomas H. Cormen (4 <sup>th</sup> edition, MIT Press & McGraw Hill, 2022) 2. Data Structure and Algorithms in C++ - Goodrich, Tamassia (2 <sup>nd</sup> edition, John Wiley and Sons Inc., 2003)
<b>Reference</b>	1. <a href="http://www.geeksforgeeks.org">http://www.geeksforgeeks.org</a> (for implementation)
<b>LMS URL</b>	<a href="http://lms.uiu.ac.bd/course/view.php?id=2459">http://lms.uiu.ac.bd/course/view.php?id=2459</a>

### Appendix-1: Program outcomes

POs	Program Outcomes
<b>PO1</b>	An ability to apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
<b>PO2</b>	Identify, formulate, research and analyze complex engineering problems and reach substantiated conclusions using the principles of mathematics, the natural sciences and the engineering sciences.
<b>PO3</b>	An ability to design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and of cultural, societal and environmental concerns.
<b>PO4</b>	An ability to conduct investigations of complex problems, considering experimental design, data analysis and interpretation and information synthesis to provide valid conclusions.
<b>PO5</b>	An ability to create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of their limitations
<b>PO6</b>	An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
<b>PO7</b>	An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
<b>PO8</b>	An ability to apply ethical principles and commit to the professional ethics, responsibilities and the norms of the engineering practice.
<b>PO9</b>	An ability to function effectively as an individual and as a member or leader of diverse teams and in multidisciplinary settings.

<b>PO10</b>	An ability to communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.
<b>PO11</b>	An ability to demonstrate knowledge and understanding of engineering and management principles and apply these to one's work as a team member or a leader to manage projects in multidisciplinary environments.
<b>PO12</b>	An ability to recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.