United International University
Department of Computer Science and Engineering (CSE)
Course Syllabus

1	**Course Title**	Data Structure and Algorithms II Laboratory
2	**Course Code**	CSE 2218
3	**Trimester and Year**	Fall 2023
4	**Prerequisites**	CSE 2216: Data Structure and Algorithms I Laboratory CSE 2213: Discrete Mathematics
5	**Credit Hours**	1.0
6	**Section**	B
7	**Class Schedule**	Wednesday: 8:30 am - 11:00 am
8	**Class Room**	Computer Lab 11 (0531)
9	**Course Teacher Information**	Md. Tarek Hasan Lecturer, Department of CSE Email: tarek@cse.uiu.ac.bd Office Room: 0319 (A)
10	**Textbook**	Introduction to Algorithms (3rd edition) by Cormen, Leiserson, Rivest, and Stein
11	**Course Contents (Approved by UGC)**	Laboratory works based on CSE 2217: Data Structure and Algorithms II
12	**Course Outcomes (COs)**	

COs	Description
CO1	Implement correct algorithms to handle large datasets efficiently.
CO2	Analyze worst-case running times of algorithms using asymptotic analysis.
CO3	Describe different algorithm paradigms and explain when algorithmic design situations call for them. Recite algorithms that employ these paradigms. Synthesize such algorithms. Derive and solve problems describing the performance of the algorithms.

13	**Teaching Method**	Lecture, and Problem Solving
14	**Mapping of COs and Program outcomes**	

COs	Program Outcomes (POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			C									
CO2		C										
CO3			C									

15	Lab Outline

Class	Topic	COs	Activities
Class 1	Introduction to C++	CO1	Lecture; Problem-Solving
Class 2	Standard Template Libraries (STL) of C++	CO1, CO3	Lecture; Problem-Solving
Class 3	Review of Recursive Function	CO1, CO3	Lecture; Problem-Solving
Class 4	**Class Performance 1**; Divide and Conquer: Max-Min Problem, Maximum Sum Subarray Approach; **Assignment 1**	CO1, CO2, CO3	Exam; Lecture; Assignment
Class 5	Greedy Algorithms: Activity Selection Problem, Coin Change Problem, 0/1 & Fractional Knapsack; **Assignment 2**	CO2, CO3	Lecture; Assignment
Class 6	**Class Performance 2;** Dynamic Programming: Coin Change Problem	CO1, CO2, CO3	Exam; Lecture
Class 7	Dynamic Programming: 0/1 Knapsack Problem; **Assignment 3**	CO2, CO3	Lecture; Problem Solving; Assignment
Class 8	Disjoint Set Union; Minimum Spanning Tree: Kruskal's Algorithm	CO2, CO3	Lecture; Problem Solving
Class 9	Minimum Spanning Tree: Prim's Algorithm; Single Source Shortest Path: Dijkstra's Algorithm; **Assignment 4**	CO2, CO3	Lecture; Assignment
Class 10	**Class Performance 3;** Single Source Shortest Path: Bellman-Ford Algorithm; String Matching: Rabin-Karp Algorithm	CO1, CO2, CO3	Exam; Lecture
Class 11	**Presentation**	CO2, CO3	

Class 12	Final Exam	CO1, CO3	Exam

Appendix 1: Assessment Methods

Assessment Method	(%)
Attendance	10
Class Performance **(N-1 out of N)**	30
Presentation	10
Assignment **(N out of N)**	25
Final Exam	25

Appendix 2: Grading Policy

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

Appendix-3: Program outcomes

POs	Program Outcomes
PO1	An ability to apply knowledge of mathematics, science, and engineering
PO2	An ability to identify, formulate, and solve engineering problems
PO3	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
PO4	An ability to design and conduct experiments, as well as to analyze and interpret data
PO5	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
PO6	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
PO7	A knowledge of contemporary issues
PO8	An understanding of professional and ethical responsibility
PO9	An ability to function on multidisciplinary teams
PO10	An ability to communicate effectively
PO11	Project Management and Finance
PO12	A recognition of the need for, and an ability to engage in life-long learning