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**	Spring 2024
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**	Sunday: 8:30 am - 11:00 am
8	**Class Room**	Computer Lab 14 (0426)
9	**Course Teacher Information**	Md. Muhyminul Haque Lecturer, Department of CSE Email: muhyminul@cse.uiu.ac.bd Office Room: 919 Phone: 01789926815 (In case of Emergency only)
10	**Counselling Hours**	
11	**Textbook**	Introduction to Algorithms (3rd edition) by Cormen, Leiserson, Rivest, and Stein
12	**Course Contents (Approved by UGC)**	Laboratory works based on CSE 2217: Data Structure and Algorithms II
13	**Course Outcomes (COs)**	

Day	Time [CNH]
Saturday	12:31 PM – 01:50 PM, 03:11 PM – 04:30 PM
Sunday	11:11 AM – 12:30 PM
Monday	-
Tuesday	08:30 AM – 11:10 AM, 12:31 PM – 01:50 PM 03:11 PM – 04:30 PM
Wednesday	11:11 AM – 12:30 PM

		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.
14	**Teaching Method**	Lecture, and Problem Solving
15	**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									

16	**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