East West University
Department of Computer Science and Engineering
Course Outline
Spring 2025 Semester

Course: CSE207 Data Structures (Section 10)

Credits and Teaching Scheme

	Theory	Laboratory	Total
Credits	3	1	4
Contact Hours	2.5 Hours/Week for 15 Weeks + Final Exam in the 14th Week	2 Hours/Week for 15 Weeks	4.5 Hours/Week for 15 Weeks + Final Exam in the 14th Week

Prerequisite

CSE110 Object Oriented Programming

Instructor Information

Instructor: Puja Chakraborty
Lecturer, Department of Computer Science and Engineering
Office: Room: #263
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Class Routine and Office Hour

	8:00AM – 10:00 AM	10:10AM – 11:40AM	11:50AM – 1:20PM	3:10PM – 4:40PM
SUN				CSE207 (10) Room: AB3 701
MON	CSE207 Lab (10) Room: 437	***Office Hour***	***Office Hour***	
TUES			***Office Hour***	***Office Hour***
WED				CSE207 (10) Room: AB3 701

Course Objective

The course develops students' skills for designing and analyzing linear and non-linear data structures. It strengthens students' ability to identify and apply the suitable data structure for solving real-world problems. Knowledge of this course will be needed as prerequisite knowledge for future courses such as CSE246 Algorithms, CSE366 Artificial Intelligence, CSE405 Computer Networks, and CSE 471 Compiler Design.

Knowledge Profile

K3: Theory-based engineering fundamentals

Learning Domains

Cognitive - C2: Understanding, C3: Applying, C4: Analyzing

Program Outcomes (POs)

PO1: Engineering Knowledge
PO2: Problem Analysis

Complex Engineering Problem Solution

EP1: Depth of knowledge required
EP2: Range of conflicting requirements

Complex Engineering Activities

None

Course Outcomes (COs) with Mappings

After completion of this course students will be able to:

CO	CO Description	PO	Learning Domains	Knowledge Profile	Complex Engineering Problem Solving/ Engineering Activities
CO1	**Interpret** and **Apply** the basic concepts of linear lists for developing effective problem solutions.	PO1	C2, C3	K3	

CO2	**Interpret** and **Apply** the basic concepts of the non-linear list for manipulating hierarchical and connected data.	PO1	C2, C3	K3	
CO3	**Choose** and **justify** appropriate data structures for solving computational problems.	PO2	C2, C3	K3	
CO4	**Analyze** and **Use** the appropriate data structure and **Write** reports to design, build and test complex problems.	PO2	C4, A2, P2, P3	K3	EP1, EP2

Course Topics, Teaching-Learning Method, and Assessment Scheme

Course Topic	**Teaching-Learning Method**	**CO**	**Mark of Cognitive Learning Levels**		**CO Mark**	**Exam (Mark)**

			C2	C3	C4		
Data Types, Pointer, Structure, Dynamic Memory Allocation and Abstract Data Types (ADTs) List ADT : Singly and doubly Linked list Implementation and Basic operations with Application	Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant	CO1		10		10	Mid Semester Assessment (30)
Stack and Queue ADT : Basic Operations	Do	CO1		5		5	
Stack and Queue ADT : Application Implementation		CO3		10		10	
Iterative Solution and Recursive Solution design		CO1		5		5	
Basic Tree Concepts, Tree Traversals, Binary Trees Binary Search Trees ADT and applications	Do	CO2		5		5	Final Exam (30)

Balanced BST		CO3		5		5	
Binary Heap implementation, application, Priority queue		CO3		5		5	
Graph representation, Terminology, Graph creation, traversal techniques, Spanning Tree, MST, Shortest Path Problem		CO2	5	5		10	
Hashing: Hash table generation, Collision resolution		C02		5		5	

Laboratory Experiments and Assessment Scheme

Experiment	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels	Mark of Psycho-motor Learning Levels		Mark of Affective Learning Levels	Mark of COs
			C4	P2	P3	A2	
Implement program using pointers, structure and DMA etc.	Preparing Pre-Lab Report, Lab Experiment and Result Analysis, Preparing Post-Lab Report	CO4					

Implementation of different operations on linked list – copy, concatenate, split, reverse, count no. of nodes etc.	Do	CO4					
Implementations of stack menu driven program.	Do	CO4					
Implementations of queue menu driven program.	Do	CO4					
Implementations of recursion.		CO4					
Implementations of BST program.	Do	CO4					
Implementations of Binary heap program.	Do	CO4					
Implementations of graph and graph menu driven program (BFS & DFS).	Do	CO4					
Lab Experiments		CO4	4	1	1	1	7
Lab VIVA	Individual Lab VIVA	CO4		3			3
Lab test	Individual Lab Test		5	2	2	1	10

Total			**9**	**6**	**3**	**2**	**20**

Mini Projects

Mini Project	Teaching-Learning Method	**CO**	**EP/ EA**	**Mark of Cognitive Learning Level**	**Mark of Psychomotor Learning Levels**		**Mark of Affective Learning Level**	**CO Mark**
				C4	**P 2**	**P3**	**A2**	
Mini Project including Report and Presentation	Group-based, moderately complex electrical circuit building for practical application with report writing and presentation	CO 4	EP1, EP2	7	1	1	1	10

Overall Assessment Scheme

Assessment Area	CO				PO Marks	
	CO1	CO2	CO3	CO4	PO1	PO2
Class Test/Quiz	5	5			10	
Mid Semester Assessment	20	0	10	0	20	10
Final Exam	0	20	10	0	20	10
Laboratory Performance and Lab VIVA	0	0	0	10		10
Lab Final				10		10
Mini Project	0	0	0	10		10
Total	**25**	**25**	**20**	**30**	**50**	**50**

Teaching Materials/Equipment

Textbook

- Gilberg, Richard, and BehrouzForouzan. Data Structures: A pseudocode approach with C, 2nd Edition, Publisher:Nelson Education, 2004.

References

- Aho, Alfred V., and Jeffrey D. Ullman. Data structures and algorithms. Publisher: Pearson, 1983
- Cormen, Thomas H., Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. Introduction to algorithms. Publisher:MIT press, 2009

Lab Manual:
Lab manual will be provided.

Project Description:
Project description will be provided.

Equipment/Software:
Any C/C++ IDE: As example, Visual C++, Code::Block, and/or Dev-C++

Exam Dates

Section	Mid Semester	Final
10	As per academic calendar	As per academic calendar

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
80% and above	A+	4.00	45% to less than 50%	C	2.25
75% to less than 80%	A	3.75	40% to less than 45%	D	2.00
70% to less than 75%	A-	3.50	Less than 40%	F	0.00
65% to less than 70%	B+	3.25			
60% to less than 65%	B	3.00			
55% to less than 60%	B-	2.75			

Academic Code of Conduct

Academic Integrity:
Any form of cheating, plagiarism, personification, or falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offense under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**
Special Instructions:

- Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48hours**of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.
- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss the final exam, the student MUST get approval of **Incomplete Grade** by written application

to the Chairperson through the Course Instructor **within 48 hours**of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.

- All mobile phones MUST be turned to silent mode during class and exam period.
- There is **zero tolerance for cheating**in exam. Students caught with cheat sheets in their possession, whether used or not;writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.