East West University
Department of Computer Science and Engineering
Course Outline
Summer 2021 Semester

Course: CSE207 Data Structures

Credits and Teaching Scheme

	Theory	Laboratory	Total
Credits	3	1	4
Contact Hours	3 Hours/Week for 13 Weeks + Final Exam in the 14th Week	2 Hours/Week for 13 Weeks	5 Hours/Week for 13 Weeks + Final Exam in the 14th Week

Prerequisite

CSE110 Object Oriented Programming

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
Psychomotor - P2: Manipulation, P3: Precision
Affective - A2: Responding

Program Outcomes (POs)

PO1: Engineering Knowledge
PO2: Problem Analysis

Complex Engineering Problem Solution

EP1: Depth of knowledge required

EP2: Range of conflicting requirements

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 list for developing effective problem solutions.	PO1	C2, C3	K3	EP1
CO2	**Interpret** and **Apply** the basic concepts of non-linear list for manipulating hierarchical and connected data.	PO1	C2, C3	K3	EP1
CO3	**Choose** and **justify** appropriate data structure for solving computational problems.	PO2	C3, C4	K3	EP1, EP2
CO4	**Analyze** and **Use** the appropriate data structure and **Write** report to design, build and test complex problems.	PO2	C3, 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	2	3		5	Midterm Exam I (20)
Stack and Queue ADT : Basic operations and Implementation	Do	CO1		10		10	
Stack and Queue ADT : Applications		CO3		3	2	5	
Iterative Solution and Recursive Solution design	Do	CO2		6		6	Midterm Exam II (20)
Basic Tree Concepts, Tree Traversals, Binary Trees		CO2	3	3		6	
Binary Search Trees ADT and applications		CO3		4		4	
Balanced BST		CO3			4	4	
Binary Heap implementation, application, Priority queue	Do	CO2		7		7	Final Exam (20)
Graph representation, Terminology, Graph creation, traversal techniques,		CO2		6		6	
Spanning Tree, MST, Shortest Path Problem		C03			4	4	

Hashing: Hash table generation, Collision resolution		C03		3		3	

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 graphand graph menu driven program (BFS & DFS).	Do	CO4					
Lab Experiments			7	1	1	1	10

Lab Exam	Individual Lab Exam	CO4	4	1			5
Total			**11**	**2**	**1**	**1**	**15**

Mini Projects

Mini Project	Teaching-Learning Method	**CO**	**Mark of Cognitive Learning Level**	**Mark of Psychomotor Learning Levels**		**Mark of Affective Learning Level**	**CO Mark**
			C4	**P2**	**P3**	**A2**	
Mini Project including Report and Presentation	Group-based, moderately complex electrical circuit building for practical application with report writing and presentation	CO4	7	1	1	1	10

Assessment Scheme

Assessment Area	**CO**				**Other**	**PO Marks**	
	CO1	**CO2**	**CO3**	**CO4**		**PO1**	**PO2**
Class Participation					5		
Class Test/Quiz					10		
Midterm-I Exam	15	0	5	0		15	5
Midterm-II Exam	0	12	8	0		12	8
Final Exam	0	13	7	0		13	7
Laboratory Performance and Lab Exam	0	0	0	15			15
Mini Project	0	0	0	10			10
Total	**15**	**25**	**20**	**25**	**15**	**40**	**45**