NATIONAL UNIVERSITY
of Computer & Emerging Sciences, Lahore

Department of Computer Science

CS-218 – Data Structures

Spring 2021

Instructor Name:	Bismillah Jan	**TA Name:**	Asjad Iftikhar
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Office Location:	Inside Liberty Lab		
Office Hours:	**Tue, Thu -02:15-04:00 p.m.**		

Course Information

Program: BS (CS)

Credit Hours: 3+ 1 for Lab

Type: Core

Class Venue: E&M 10

Pre-requisites: Object Oriented Programming (CS-217)

Class Meeting Time: Section (BCS-4G) Tue- Thu 11:00 – 12:20 PM
Section (BCS-4H) Tue-Thu 12:30 – 1:50 PM

Course Description/Objectives/Goals:

The core objectives of this course are to,

- Introduce students with data structures and their associated algorithms
- Introduce the concept of efficient data structures and how their efficiency can be measured.
- Prepare students to select appropriate data structure for a given computational problem._

Course Textbooks:

Any one of these books is recommended as a text book:

1. Mark Allen Weiss, Data structures and algorithm analysis, Pearson Education, 2007.
2. Adam Drozdek, Data structures and algorithms in C++, Course technology, 2004.
3. Nell Dale, C++ Plus Data Structures, 3rd Edition, Jones and Bartlett, 2003.
4. Michael T. Goodrich, Roberto Tamassia and David M. Mount, Data structures and algorithms, 2nd Edition, JohnWiley & Sons, 2011

(Tentative) Grading Criteria:

Assignments + Project **(15%)**

Quizzes **(15%)**

Midterms **(30%)**

Final Exam **(40%)**

- Grading scheme for this course is **Absolute** under application of CS department's grading policies.
- Minimum requirement to pass this course is to obtain at least **50%** absolute marks

Tentative Course Outline and Lecture Plan

No. of lectures	Topics
1	Introduction
2	Time Complexity Analysis and Asymptotic Bounds
4	Linked Lists • Review of pointers • Singly lined list, doubly linked lists, circular lists and corresponding iterators
3	Stacks and Queues
MID Term 1	
2	Recursion
3	Trees • Binary trees and their traversals • Binary search trees (Insertion, Deletion and Search)
3	Height Balanced Binary Search Trees (AVL Trees)
2	Heap and Heap Sort
MID Term 2	
1	Data compression and Huffman coding
2	Hashing • Hash tables and Hash functions • Collision resolution
2	Graphs, Breadth First Search (BFS) and Depth First Search (DFS)
3	Advanced Topics
Final Exam	

Course Policies:

- All assignments and homework must be done individually
- Late Submissions/Retake of any assessment is not allowed.
- **Plagiarism** in any work (Quiz, Assignment, Midterms, Project and Final Exam) from any source, Internet or a Student will result in **deduction of absolute marks or F** grade.
- Minimum **80%** attendance is required for appearing in the Final exams.
- All the CS department's grading policies apply.