NATIONAL UNIVERSITY
of Computer & Emerging Sciences, Lahore

Department of Computer Science

CS2001 – Data Structures
Spring 2023

Instructor: Samman Ashraf **Email:** samman.ashraf@nu.edu.pk

Office Hours: TBA

Credit Hours: 3 + 1 **Prerequisite** Object-Oriented Programming

Course Objectives:

CS2001 is a core Computer Science course with Computer Programming as its prerequisite. The objectives of this course are:

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

Text Book:

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

- Mark Allen Weiss, *Data structures and algorithm analysis*, Pearson Education, 2007.
- Adam Drozdek, *Data structures and algorithms in C++*, Course technology, 2004.
- Nell Dale, *C++ Plus Data Structures*, 3rd Edition, Jones and Bartlett, 2003.

LECTURES	TOPICS
1	Introduction
2	Time Complexity Analysis and Asymptotic Bounds
4	List, Stacks, and Queues <Array based>
4	Linked Lists Review of pointers Singly linked lists
MIDTERM 1	

2	Doubly linked lists, circular lists and corresponding iterators Linked list bases stacks and queues
2	Recursion
5	Trees Binary trees and their traversals Binary search trees (Insertion, Deletion and Search)
2	Height Balanced Binary Search Trees (AVL Trees)
MIDTERM 2	
2	Heaps and heap sort
1	Data compression and Huffman coding
1	Hashing Hash tables and hash functions Collision resolution
2	Graph data structure, Breadth first search and Depth first search

(Tentative) Grading Criteria:

Assignments **(10%)** Quiz **(10 %)** Midterms **(30 %)**
Project **(10%)** Final Exam **(40 %)**

Course Policies:

- Quizzes may be unannounced.
- All assignments and course work must be done individually.
- In case of cheating, both parties will be considered equally responsible.80% attendance is required for appearing in the exams.No Late Submissions
- No Makeup Quizzes.
- 80% attendance is required for appearing in the Final exams.

Passing criteria:

Minimum requirement to be eligible to pass this course is to get at least 50% marks in the course. All CS department's grading policies apply. Grading scheme for this course is **Absolute**.