CS 201: DATA STRUCTURES
COURSE OUTLINE
FALL 2021

Course Instructor: Zareen Alamgir
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Office Hours: TBA

All assignments, home-works, helping material, and announcements will be posted on Google Classroom

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Course Objectives

The objectives of this course are:

- Introduce the students to basic data structures and related algorithms
- Introduce the theory of complexity and develop the skills to analyze time and space requirements for a data structure and its associated algorithms
- To prepare the students to pick the right data structure for a given problem

Pre-requisite

Computer Programming. It is assumed that students have good command on programming in C++.

Textbook

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

- Mark Allen Weiss, *Data structures and algorithm analysis*, 4th Edition, Pearson Education.
- Adam Drozdek, *Data structures and algorithms in C++*, 4th Edition, Course technology.
- Nell Dale, *C++ Plus Data Structures*, 3rd Edition, Jones and Bartlett.
- Michael T. Goodrich, Roberto Tamassia and David M. Mount, *Data structures and algorithms*, 2nd Edition, John Wiley & Sons.

Grading Scheme

Midterms	30%
Quizzes	10%
Homeworks	0%
Assignments/Projects:	20%
Final:	40%

- **An absolute grading scheme will be adopted for this course.**
- Academic integrity is expected of all the students. Plagiarism or cheating in any assessment will result in at least an **F** grade in the course and possibly more severe penalties.

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-linked lists, doubly linked lists, circular lists and corresponding iterators
3	Stacks and Queues
MidTerm 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	Heaps and heap sort
MidTerm 2	
1	Data compression and Huffman coding
2	Hashing Hash tables and hash functions Collision resolution
2	Universal hashing
3	Graphs, Breadth-first search and Depth-first search

Important

- ***There will be no makeup quiz.*** Mostly quizzes will be announced. However, we may have a surprise quiz, so always come prepared in the class.
- Submit assignments on time. No late assignments will be accepted.
- You can have assignments with no weightage; failing to submit an assignment will result in a -1 absolute penalty.
- There is a strict policy against plagiarism and cheating. **The penalty can be an F grade.**
- Be on time in class. All latecomers will be marked absent.
- Switch off mobile phones in class.