

CS 201: DATA STRUCTURES SECTION A & B
COURSE OUTLINE
Spring 2020

Course Instructor: Amna Khan

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Office Hours: Monday & Wednesday 2:30pm - 3:30pm (Google Hangout)

Credit hours: 3

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

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

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

- Minimum eligibility to pass this course is to get 50% marks.
- 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 |

GRADING POLICY

The grading policy will be relative as per IOM-Grading Policy for Spring 2020 (Uploaded on SLATE)

IMPORTANT

- Minimum requirement to pass this course is to get at least 50% marks in total.
- ***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 late comers will be marked absent.
- Switch off mobile phones in class.