CS5403 - Data Structures and Algorithms (Fall 2017)

Course Description:
This course introduces data structures. Topics include program specifications and design; abstract data types; stacks, queues; dynamic storage allocation; sequential and linked implementation of stacks and queues; searching methods, sequential and binary; binary trees and general trees; hashing; computational complexity; sorting algorithms: selection sort and merge sort; comparison of sorting techniques and analysis. Programs are written in C++.

Prerequisites:
- Graduate Standing.
- CS5303 Introduction to Programming and Problem Solving.
- Programming in C++. This is very important to be successful in the course since assignments require you to write lots of C++ programs.

Instructor:
Baris Coskun is a research scientist working on statistical machine learning and information security.
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Textbook:
Title: Data Structures and Other Objects Using C++
Author: Michael Main and Walter Savitch
Edition: fourth
Publisher: Addison-Wesley

General Information:
It is your responsibility to read all information in this "Syllabus and Policies" section carefully.

This is an entirely online course. The general structure for each topic will look like this:
1. Read the slides.
2. Read relevant portions of the book.
3. Attempt the homework (including written and programming) on your own.
4. Participate in a discussion of the solutions of the homework online.
5. Participate in discussion in weekly interactive sessions.
6. Midterm and final exams will be given online.

I expect that a student who is well-prepared for the course will spend about 10 hours a week on it.
**Interactive Sessions:**
There will be interactive sessions through the semester where we will discuss specific topics, homework or other questions you may have. These sessions are tentatively scheduled for **Tuesdays 9:30pm Eastern Time.** There may be changes to this schedule from time to time, which will be announced in advance. The technical details of these sessions will be announced soon. Check course announcements frequently.

**Grading Distribution:**
Your grade will be determined based on 30% homework, 30% midterm, 30% final, 10% online participation.

**Exams:** There will be midterm and final exam for this course. Exam time will be arranged ahead of time. Generally, you are not allowed for missing the exams.

**Homework and Online Participation:** You are expected to complete the homework. No late homework accepted. The process for the homework will be as follows: Before doing the homework you should read the slides and the associated part of the book. If you have any questions about the material you should post a question online or bring it up during interactive sessions.

Homework will be assigned regularly and all work must be submitted via NYU Newclasses system. You should complete the homework on your own. You must not use the Internet to find the solutions. Every word of what you hand in should be your own. If it is not you are committing academic dishonesty. Online participation includes participation in online forum discussion and submitting answers to online problems as required.

**Academic Honesty:** You are required to do the homework completely and entirely on your own, unless otherwise explicitly specified by the professor. You may not try to find the solutions on the web. All words in any homework you hand in must be your own. It is expected that your homework will not be perfect. Yet it is a way of showing me how much you understand the course content.

**Tentative Topics for this semester:** (They may slightly change as we proceed.)
- Lecture 1 -- Software Development
- Lecture 2 -- Class Design
- Lecture 3 -- Point Class
- Lecture 4 -- Container Class
- Lecture 5 -- Pointers
- Lecture 6 -- Linked Lists
- Lecture 7 -- Templates (for education only)
- Lecture 8 -- Stacks
- Lecture 9 -- Queues
- Lecture 10 -- Recursion
- Lecture 11 -- Binary Trees
- Lecture 12 -- Explanation of Traversals
- Lecture 13 -- Searching
- Lecture 14 -- Sorting
Moses Center Statement of Disability

If you are a student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

NYU School of Engineering Policies and Procedures on Academic Misconduct

A. Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School’s rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School’s Policy on Academic Misconduct.

B. Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

1. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person’s work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.

2. Fabrication: including but not limited to, falsifying experimental data and/or citations.

3. Plagiarism: intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.

4. Unauthorized collaboration: working together on work that was meant to be done individually.

5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.

6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.