CSCI 235 – Software Design & Analysis II

Instructor: Justin Tojeira Semester: Fall 2025

Text: *Data Abstraction and Problem Solving with C++: Walls and Mirrors*, 7th Edition, Frank M. Carrano, ISBN-13: 978-0134463971.

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Other Useful Resources

- Open Data Structures in C++ (http://opendatastructures.org/)
- Prof. Stewart Weiss' notes: http://www.compsci.hunter.cuny.edu/~sweiss/course_materials/csci235/csci235_lecture_notes.php
- The C++ Standard Template Library: https://cplusplus.com/reference/stl/

Course Description

This course will cover object-oriented programming and some simple data structures, including arrays, lists, stacks, queues, and trees. We will study the implementation and functionality of these data structures, and learn how to analyze their efficiency. We will also learn basic principles of software design.

Learning Outcomes

- Design and implement classes in C++ in accordance with best practices of object-oriented programming.
- Explain the principles of object-oriented programming using correct terminology.
- Describe the implementation of the data structures we cover.
- Demonstrate the operations of the data structures we cover.
- Relate the data structures we study to C++ STL containers.
- Analyze the computational complexity of simple functions.
- Implement recursive solutions to simple problems.
- Produce working code quickly.

Grading

Your final grade will be weighted as follows:

- Final exam: 35%
- Midterm exam: 25%
- Programming Assignments: 30%
- Quizzes: 5%
- Attendance: 5%
- There may be a small amount of extra credit for class participation and attending workshops. More information will be given on this.

Exam Makeup Policy

If you miss the midterm or final for a valid reason, you may petition for an INC at the end of the semester and make up the exam after the semester has concluded, provided you meet the following requirements:

- You have a valid and documented reason for missing the exam.
- You took the other exam as normal and passed.
- You're on track to pass the class based on all other work.

Programming Assignments

This is a software analysis and design course, not a "tech project" course. As such, the focus is on code and algorithms, and you are expected to write all of your own code and be able to explain every line of code you turn in on any homework or assignment. Thus:

- You are not permitted to share your code with other students. If you use GitHub or any other repository while you work on your projects, make sure all class projects are kept private until a month after the class ends.
- You are not permitted to post homework or assignments from this course to any forum (Stack Overflow, Chegg, Course Hero, GeeksforGeeks, etc), or to otherwise solicit solutions.
- You are not permitted to use any generative AI to write code or any other answers for you.
- Design, analysis, and implementation are the cornerstones of this course. If you don't try to design both the algorithm and code yourself before looking up an answer, you will not learn what you will need in order to pass the exams.

Programming assignments will be submitted on Gradescope, and will be graded using the autograder and/or manual grading.

Quizzes

Quizzes will be given online, and each will have to be completed during a predefined time frame. While the quizzes aren't weighted very much in your grade, they will hopefully help you learn the material, help prepare you for the exams, and help you assess your ability and understanding of the material.

Attendance

Attendance will be taken in class via short programming exercises. These will not be graded, only used for attendance purposes. They will be given sometime during the class. If excessive lateness is observed, I will start taking attendance earlier.

Syllabus Compliance

This syllabus is a guide for the course and is subject to change if the need arises. Any adjustment to the material, schedule, or grading policy will be posted on Brightspace.

Additional Contact Information

Computer Science Department main office: North 1008 (10^{th} floor North Building), 212-772-5213

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a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).
b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.
CUNY Policy on Sexual Misconduct Link: https://www1.cuny.edu/sites/title-ix/campus/university/

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Departmental Learning Goals

This class satisfies the following learning goals, as set forth by the Computer Science department: (1a) Understanding the basic foundations and relevant applications of mathematics and statistics, particularly those branches related to computer science, by using mathematics to analyze algorithm performance. (2a) Deep practical knowledge of one widely used programming language (C++). (2c) Be able to apply principles of design and analysis in creating substantial programs.

Acknowledgments

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