

CPSC 250: Data Structures and Algorithms

Fall 2022

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Class Meetings: MWF: 1:10pm - 2:10pm, Trexler 363

Lab: T: 3:00pm - 6:00pm, Trexler 363

Office Hours: T: 2pm - 3pm; W: 10:30am - 11:30am; Th: 1:00pm - 2:00pm; and by appointment

Syllabus

Course Description: In this course we will study data structures and algorithms. We will learn how to design and analyze algorithms along with the data structures they operate on. We will also learn how to prove the correctness of an algorithm and measure its efficiency. C++ will be our main programming language.

Text: *Introduction to Algorithms, 3rd Edition*, by Cormen, Leiserson, Rivest and Stein.

Prerequisites: CPSC 170, or permission of instructor. Familiarity with Linux/Unix is assumed.

Intended Learning Outcomes

By the end of the course, successful students will have the following abilities:

1. design, implement, and test algorithms in C++,
2. analyze the efficiency of various data structures and algorithms,
3. semi-formally prove the correctness and efficiency of various data structures and algorithms, and
4. evaluate the practical implications of different implementations of datastructures and algorithms.

Mechanics

The course will meet in class for 3 hours during the week, and there is a weekly 3 hour lab. The concepts studied in class will be complemented by programming and laboratory assignments. In class, we will focus on theory, in the lab, we will focus on C++ implementations of the concepts covered in the class. There will be a midterm and a final exam during the semester.

Homework Assignments: There will be regular homework assignments. All homework should be submitted on Inquire as PDF documents typeset in L^AT_EX. Screenshots, photographs or scans of pages will not be accepted. Late submissions will not be accepted.

Programming Assignments: There will be regular programming assignments to be turned in on Inquire. The programs you turn in must work correctly on the computer science server. Late submissions will not be accepted.

Midterm Exam: There will be one midterm exam in class on **Friday, October 14, 2022.**

Final Exam: The final exam will be a take-home exam **due by 5pm on Friday, December 9, 2022.**

Make-ups for the midterm and the final will be available only in case of documented medical emergencies.

This course expects you to spend at least 12 hours each week, outside of class and lab, on homework and programming assignments.

Co-curricular Requirement: Besides the quizzes, homeworks and exams, there is a co-curricular requirement. The Mathematics, Computer Science and Physics department offers a series of discussions that appeal to a broad range of interests related to these fields of study. These co-curricular sessions will engage the community to think about ongoing research, novel applications and other issues that face these disciplines. Each student is required to attend at least three of these sessions, and turn in a short paper describing the contents of the session, and his/her critical reflections about the topic and content. These papers are due in class within a week of the session. A paper submitted beyond a week from the event being discussed in the paper will not be accepted. The MCSP Conversation Series website has the schedule of talks in the series.

Grading

The weights for the various components will be:

Co-curricular	4%
Homework Assignments	28%
Programming Assignments	28%
Midterm	20%
Final	20%

The final letter grade will be computed according to the following scale:

< 60	60 – 62	63 – 65	66 – 69	70 – 72	73 – 75	76 – 79
F	D-	D	D+	C-	C	C+
	80 – 82	83 – 85	86 – 89	90 – 92	> 92	
	B-	B	B+	A-	A	

Class Attendance and Policies

Regular attendance in class is highly recommended. Regardless of attendance, students are responsible for all material covered or assigned in class. If you miss a class, please get notes from someone in class and review the notes. After you have reviewed notes from class that you missed, if you need clarifications, I will be happy to help.

Cell phones should be kept in your backpacks or pockets (essentially, out of sight), and turned to the silent mode throughout the duration of the class. Please do not remove your cell phones until you are outside the classroom/lab. Similarly, during office consultations or consultations in the lab (even when it is not during regular class time), your cell phones should be out of sight and in the silent mode.

If you use an electronic device such as a tablet or a laptop for note-taking or to read the textbook, the content that is open on the screen should be strictly restricted to documents and pages of relevance to the class. For example, you should not have any social media websites open in your browser window, even if it is in a tab that is not currently in focus.

Academic Integrity

Students are expected to adhere to the Academic Integrity policies of Roanoke College. All work submitted for a grade is to be strictly the work of the student

unless otherwise specified by the instructor. The policies as outlined in the Academic Integrity handbook will be enforced in the course.

Graded programs are subject to the Roanoke College Academic Integrity policies. Copying a program or a portion of a program (even a single line) or reading another person's program to obtain ideas for solving a problem is plagiarism. Other examples of integrity violation include writing code for someone else, using code written by someone else, telling someone else how to solve a problem or having someone tell you how to solve a problem (and using his/her method). These cases apply to any work that is handed in for a grade under the instructor's assumption that the work is your own. Unless specified otherwise by the instructor, discussion among students should be limited to general discussion of concepts and language details, not specific aspects of a solution to the assigned problem.

COVID-19 Related Requirements and Exceptions

Covid-19 Policy If you have a temperature of 100.4° F or higher or other coronavirus symptoms, please don't come to class. Call Health Services IMMEDIATELY. Do not come to class or go to any public area on campus. Do keep up with all readings, assignments, and deadlines. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them about coronavirus symptoms. If Health Services informs you that you should isolate and not attend class for multiple days or weeks, inform me so that we can make a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused, but you will need to do the work and graded assignments.

Masks : The College does not require masks to be worn at all times. Nonetheless, I will wear a mask in class, and in my office when talking to students. I *strongly encourage* you to wear a mask in class, and *require* you to wear a mask in my office. I do not have extra masks, so please make sure you have a mask when you come to my office.

Please do not bring any food or drinks into the classroom.

If I need to make modifications to the syllabus during the semester I will make the changes only after discussing them with the class.