

# CPSC250A: Data Structures and Algorithms

Fall 2015

**Class: MWF, 1:10-2:10pm in Trexler 363**

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

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**Office Hours: M 5:00-6:00pm; TTh 1:00-2:30pm; W 10:00-11:30am;  
and by appointment.**

## Syllabus

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### Course Description

In this course we will study advanced data structures, algorithms associated with, and that use, these data structures, the impact that various implementations of these data structures have on algorithms, and learn to implement these data structures and algorithms in C++.

### Text

*Introduction to Algorithms*, by Cormen, Leiserson, Rivest and Stein, McGraw Hill.

### Prerequisites

CPSC 170, or permission of the instructor. Familiarity with Unix is assumed.

### Intended Learning Outcomes

At the end of this course successful students will be able to:

1. design, implement, and test algorithms, using the C++ programming language, on non-linear data structures,
2. analyze the efficiency of various data structures and algorithms,
3. informally prove the correctness and efficiency of various data structures and algorithms, and
4. evaluate the practical implications of different implementations of data structures and algorithms.

### Mechanics

The course will meet in class for 3 hours during the week, and there will be a 3 hour laboratory period. The concepts studied in class will be complemented by several programming and laboratory assignments. There will be three tests in class (on **September 25, October 30, and December 4**) during the semester. **The final exam is scheduled for Wednesday, December 16, 2015 from 2:00 - 5:00pm.**

In case of scheduling conflicts, make-up tests will be available *by pre-arrangement only*. After the test, make-ups will be available only in case of documented medical emergencies.

Besides the exams, there will be quizzes in class, regular homework assignments, short programming projects, and a co-curricular requirement.

This course expects you to spend *at least* 12 hours of work each week inside and outside of class.

**Quizzes:** Quizzes will be in class and will be announced one class period before the quiz.

**Programming projects:** There will be several short programming projects assigned during the semester. Programs will be graded on correctness, style and documentation. Programs are due by midnight on the assigned date. All programs are to be turned in electronically; instructions for submission will be given in the assignment handout.

**No late work (programs, homeworks, quizzes, etc.) will be accepted.**

**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 final grade will be computed based on the grades in the quizzes, tests, the final exam, home works and programming projects according to the following weights:

Component	Weight	
Co-curricular	4%	
Home works	10%	
Quizzes	10%	
Programming Assignments	26%	
Tests (3)	30%	(10% each)
Final Exam	20%	

The final course grade will be calculated as follows:

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

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.