

CS 311: Algorithms and Data Structures

Spring 2024, MW 10:30-11:45 plus lab Monday 3:00-5:45 or online

Instructor Information

Name: S. Seth Long, Ph.D
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Office Hours: Monday 1:30-3:00, Thursday 10:30-12:00
Course Website: <http://isoptera.lcsc.edu/~seth/cs311>

Course Goals

CS311 covers the workings of common data structures for computer programming including linked lists, trees, heaps, hash tables, and algorithms used to manipulate them. Data structures will be implemented in C++, giving ample opportunity to understand memory management details of each structure. The C++ STL is also covered, as a useful library to take advantage of these structures without a custom implementation. Finally, CS311 will give further experience in memory management and debugging.

Textbook

C++ Early Objects, Tony Gaddis, Judy Walters, and Godfrey Muganda, 9th edition

Grading

Your grade will be calculated based on the following items:

Item	Percentage of grade
Midterm	15%
Final	25%
4 Projects	40% total (10% each)
Lab Assignments	20% total

Lab assignments will typically be made available prior to the week they are listed in, and due on Monday of the week after. Refer to the course calendar for timing. Not all weeks have a lab assignment.

The midterm and final will be on paper. Online students can either join the in-person section for tests, or make arrangements with a testing center at LCSC or elsewhere.

Grades will be assigned according to a standard curve, that is:

- A: 90% +
- B: 80%- 90%
- C: 70%- 80%
- D: 60%- 70%
- F: less than 60%

Use of + or - grades (such as B+ or A-) and curves will be at the instructor's discretion.

Deadlines and late work

Late work will not be accepted except by instructor discretion. However, partial credit will be given for partially-completed work. It is better to turn in an unfinished assignment for partial credit than to not turn in something on time and receive a 0.

Attendance

Attendance will not be taken in this class except as required for financial aid purposes. However, all material presented during lecture and student presentations is “fair game” for the midterm and final, and some of this material may not be in the book as well. Therefore I recommend that you always attend class.

Academic Dishonesty

Cheating on any assignment will result in failing the class. Some things which constitute cheating in this class are:

- Copying another student’s homework
- Turning in homework created by another student
- Reading another student’s answers on a test
- Sharing all or part of your completed homework with another student before the assignment is due

Appropriate collaboration on homework involves sharing ideas with other students only, not source code! Although it is often tempting to help another student by showing them how your completed program works, this is not helpful to their learning. However, this does not mean you cannot collaborate with other students on homework. Sharing of ideas, principles, and algorithms is permitted and encouraged.

Tentative Course Calendar

Spring 2024 CS311 Tentative Schedule	
Week Of	Course Content
Jan 15	C++ Review and Pointers
Jan 22	C++ Objects
Jan 29	Linked Lists
Feb 5	Stacks and Queues
Feb 12	Finding Memory Errors
Feb 19	Template Classes
Feb 26	Sorting, for Linked Lists and Arrays
Mar 4	Midterm
Mar 11	Binary Trees (unbalanced)
Mar 18	Red/Black Trees
Mar 25	Spring Break
Apr 1	Heaps
Apr 8	More on Heaps or Catch Up
Apr 15	Hash Tables
Apr 22	Remaining data structures topics (probably algorithm analysis)
Apr 29	Finishing Projects
May 6	Final Exam is Monday, May 6, at 10:30 AM in MLH 310, or as listed on the official LCSC final exam schedule