

Course Syllabus

Course Learning Objectives

The student will be able to:

- Apply the steps of the design recipe to develop small programs in a way that scales to large programs.
- Describe and define the Abstract Data Types (ADTs) covered, including lists, stacks, queues, priority queues, binary search trees, AVL trees, and hash tables.
- Describe the meaning of operations on the given ADTs using complete test cases.
- Explain, and diagram “by hand”, functional and imperative implementations of methods associated with the given ADTs.
- Analyze for performance some algorithms associated with the given ADTs.
- Compare and contrast array and linked-list implementations of certain ADTs.
- Compare and contrast imperative and functional implementations of given ADTs.
- Implement and test each given ADT as a generic program.
- Use ADTs in software applications.
- Discuss the runtime and memory efficiency of principal algorithms for sorting.
- Demonstrate different traversal methods for trees, including pre, post, and in-order traversal of trees.
- Model a variety of real-world problems in computer science using appropriate forms of trees, such as representing the organization of a hierarchical file system.
- Determine whether a recursive or iterative solution is most appropriate for a problem.

Class Setup

Canvas - Canvas will be used to manage all of the resources you will need for the class.

Zoom - All lectures and labs will take place on Zoom.

GitHub Classroom - We will be using GitHub Classroom to submit and manage all of our labs and projects.

Piazza - Any questions you have about labs, projects, or concepts can be put here. Anyone may answer the questions put up, but no code should be shared in a post.

Grade Categories

Labs - 20%

There will be 9 labs in the course and will be assigned on a weekly basis. For labs you can work with a partner but each person must submit an assignment for grading. In the README for your labs, you should specify who you worked with if you worked with anyone.

Projects - 35%

There will be 5 projects in the course and will be assigned about every 2 weeks. **For projects, you can not work with other students.**

Quizzes - 15%

There will be about 5 quizzes and will be assigned about every 2 weeks. Quizzes are to be completed individually during lab periods. They will take approximately 20-30 minutes and there will be only 1 attempt allowed.

Final - 20%

The final will be a common final and will take place during finals week. The final will also be completed individually and will take around 2-3 hours.

Participation - 10%

This grade will be determined by your completion of in-class activities and your participation in lecture, lab, and office hours.

Extra Credit - ???

I'm planning to offer some opportunities to earn extra credit for the class. For now, I'm thinking about extra credit for:

- Attending the winter career fair
- Competing in a hackathon
- Making a website to show off projects and your resume
 - Not as hard as you think and it's free on Github

This will also serve as part of the curve for the class.

Grade Breakdown

A 100-92 C 77-72

A- 92-90 C- 72-70

B+ 90-87 D+ 70-67

B 87-82 D 67-62

B- 82-80 D- 62-60

C+ 80-77 F 60-0

***C- is needed for advancement to CPE 203

Anything Else?

We can talk during class if there are more questions.