CSE 2050: Data Structures and Object-Oriented Design

Term: Spring 2024

Instructor: Chris Kmiecik (chris.kmiecik@uconn.edu)

Office Hours & Availability: Office hours will be posted in Announcements on Husky CT.

Course Objectives

1. Write programs in python using imports, functions, and object-oriented programming.
2. Compare data structures and algorithms based on time and space complexity and choose the correct ones for a given problem.
3. Implement abstract data types (stacks, queues, deques, mappings, priority queues) using various data structures (lists, linked lists, doubly linked lists, heaps, trees, graphs) and algorithms.
4. Use recursive algorithms to solve problems.

Materials, Platforms, and Software

- Textbook: A First Course on Data Structures in Python (open source pdf)
- Computer and internet connection
- HuskyCT
- Python 3 - We code in Python 3 in this course. You can code however you're comfortable:
  - write and run code in a terminal
  - write code in a simple text editor, run code in a terminal
  - write and run code within an integrated developing environment (IDE). (e.g., VS Code, PyCharm).

Schedule

Dates	Module Opens in HuskyCT	Reading
1/17 - 1/21	Mod 1 - Basic Python	Ch 1-2
1/22 - 1/28	Mod 2 - Object-Oriented Programming & Testing	Ch 3-4
1/29 - 2/4	Mod 3 - Running Time Analysis	Ch 5
2/5 - 2/11	Mod 4 - Linear Data Structures	Ch 6-8
2/12 - 2/18	**Exam 1**	
2/19 - 2/25	Mod 5 - Recursion & Dynamic Programming	Ch 9-10
2/26 - 3/3	Mod 6 - Searching and Sorting	Ch 11-12
3/4 - 3/10	Mod 7 - Divide-and-Conquer	Ch 13-14
3/11 - 3/17	Spring Recess	
3/18 - 3/24	Mod 8 - Mappings and Hashing	Ch 15
3/25 – 3/31	**Exam 2**	
4/1 - 4/7	Mod 9 - Trees	Ch 16-18
4/8 - 4/14	Mod 10 - Priority Queues & Heaps	Ch 19
4/15 - 4/21	Mod 11 - Graphs (Part I)	Ch 20-21
4/22 - 4/28	Mod 11 - Graphs (Part II)	Ch 20-21
04/29 - 04/3	**Exam 3**	

Due dates for assignments will be stated in each assignment. Each module typically has a lab and a homework. Labs are typically due at 6:00 PM EST the following Sunday (e.g., Lab 1 is due on 1/21). Homework is typically due at 11:00 PM EST the following Tuesday (e.g., the Module 1 homework assignment is due on 1/23). Exceptions are:

- Mod 4 homework - due Tuesday, 2/20 (after exam 1)
- Mod 7 homework - due Tuesday, 3/19 (after spring break)
- Mod 8 homework - due Tuesday, 4/2 (after exam 2)
- Mod 11 homework - due Friday, 4/26 (last day of classes)

Exams 1 and 2 will be held during Wednesday's lecture in the weeks shown. The Monday of that week will be reserved for make-up material or exam review.

Grades

Participation (5%)

Two of the Computer Science program objectives (full list here) often surprise students:

3) an ability to communicate effectively with a range of audiences

...and…

5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

Our participation policy encourages you to build these skills, while giving you some flexibility in how you demonstrate them.

You can earn 1 point/week in lab and 1 point/week in lecture. Excluding exam weeks, where there typically will not be participation opportunities, that makes 23 possible points (12 weeks lecture + 11 weeks lab). We cap participation credit at 15 points, just under 2/3rds of the points possible. We chose this threshold with a few things in mind:

- You must attend at least a few weeks of both lectures and labs to get full credit. We want you to give both a fair shake.
- You can miss about 1/3rd of both lectures and labs for any reason, no questions asked.

There is no extra credit for going above and beyond 15 points - we do not want to incentivize attending when you shouldn't. Take care of yourself.

Note that this credit is for demonstrating an ability to communicate to a range of audiences (in lectures, by giving useful feedback in class polls and working with neighbors during group activities; in labs, by working with your partner.). You will not receive credit just for attending; you must actively participate.

Labs (10%)

Weekly collaborative programming assignments. Feel free to share your approach with other students, but each student must each submit work individually.

Homework (25%)

Homework assignments are tough programming problems designed to assess your mastery of each module. They are not collaborative. Do not share any code, including no sharing of any test cases you write.

We will manually grade homework assignments. Broadly speaking, we will consider Structure, Testing, Efficiency, and Readability when grading.

Homework Collaboration:

We need to assess individual mastery on homework assignments. To this end, we are enforcing the following policies:

- Do not copy/paste chunks of code from an external source, including the textbook or sites like ChatGPT, as your starting point. These are great resources for learning, but you need to be

able to "put it in your own words." I'd advise you follow this protocol if you find yourself in a situation where you've encountered a large chunk of useful code elsewhere:

  - Copy/paste the code locally. Run it, experiment with it, extend it
  - Delete your local copy
  - Go do something else for at least 2 hours
  - Come back and write the code from scratch without referencing the source

  This will ensure you really understand any code you are submitting to the point of mastery - the ability to write such code from scratch.

- Do not share any code with anyone but an instructor. This includes sharing .py files, screenshots of code, or screen-sharing during a video call.
- Do not post new questions on forums (e.g., Chegg, StackOverflow, Reddit, other Discord servers).

Exams (60%)

Exams will be held during the lecture/lab period on the weeks shown in the schedule above (i.e., Wednesday). Exams are weighted progressively:

- Exam 1 - 15 %
- Exam 2 - 20 %
- Exam 3 - 25 %

Makeup exams are only offered for exceptional circumstances. If you cannot take an exam, contact your professor as soon as possible. The earlier you contact us, the more likely I can provide a better alternative than a 0.

Late Work Policy

No extensions on assignments will be provided. However, you can complete the assignments, submit it late, and then request partial credit for the assignment. You can only request partial credit consideration AFTER you have completed the assignment. You only notify me AFTER you have submitted the assignment (late). I will assess your grade at that time based on how late it is (i.e., if you're going to be late on an assignment, get it done as quickly as possible.

In the event of a major life event that warrants additional extensions (it happens), you may have to get verification from the Dean of Students.

Thresholds

Exact floors and half letter grades will be determined at the end of the semester according to the standards of performance below. Approximate thresholds are listed in parentheses for reference but are not a guarantee.

- A - Excellent (~93%)
- B - Good (~85%)
- C - Average (~75%)

- D - Poor (~65%)
- F - Failure

Academic Misconduct

The penalty for academic misconduct is an F in the course. Academic misconduct includes but is not limited to:

- Submitting any code you did not write yourself
- Sharing any code with classmates
- Sharing a video feed of your code
- Discussing exams before all grades are posted
- Posting questions on forums like Reddit, StackOverflow, or Chegg.

Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources, which include:

- The Student Code
  - Academic Integrity
  - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Credit Hours and Workload
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

Students with Disabilities

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, http://csd.uconn.edu/.

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation

Act issued in the United States federal government." (Retrieved March 24, 2013 from Blackboard's website)

Help

Additional remote office hours will be determined by the class early in the semester. An announcement will be posted on HuskyCT.

Evaluation of the Course

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE). Additional informal formative surveys may also be administered within the course as an optional evaluation tool.

There is also a Discussion Board on HuskyCT that allows you to post any comments about the course/instructor at any time; anonymous posts are permitted.

Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus will be posted on HuskyCT.