CSC-231-801-803 merged (Fall 2020)

Jump to Today

Introduction to Data Structures, Fall 2020

Where: Online
When: Weekly modules. Materials will be posted prior to Monday 8am. Assignments are due Sunday night.
Instructor: Dr. Lucas Layman (Links to an external site.)

- **Email:** laymanl@uncw.edu
- **Slack channel:** https://join.slack.com/t/drlaymansclas-7jh3938/shared_invite/zt-i0z8a035-EppR8j6fAfxMb92Z4JXu3A (Links to an external site.)
- **Office hours:** Use Slack any time. 1-on-1 Zoom teleconferencing appoints are also available. See the Communications Policy for details.

Tools for Online Coursework

- Slack (Links to an external site.) - The best way to get in touch with me, get help, and chat with your peers.
- Zoom (Links to an external site.) - video conferencing software for screen sharing and live meetings.
- Canvas guides (Links to an external site.) - for help with anything Canvas related

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Course description

Study of basic data structures and their applications. Lists and trees; searching and sorting algorithms; hashing; analysis and design of efficient algorithms. Recommended for CSC majors only. A grade of 'C' (2.00) or better is required for taking courses for which CSC 231 is a prerequisite.

Storing, searching, and sorting data are basic functions performed in every software system. Strategies and algorithms for organizing data are foundational to computer science, and are applicable to computing domains from systems engineering, to software engineering, to digital arts. Students will gain an understanding of the strengths and weaknesses of well-known data structures and algorithms by implementing them in Python.

What to expect: The class will be a mix of virtual lectures and programming activities. Each homework assignment and quiz will compound on all previous work so that you will have ample opportunity to practice and become expert in the material. This course is *programming intensive*. You must demonstrate programming competence and growth throughout the semester in order to pass this course.

- Class will *not* meet in person.

- Class will *not* be meeting synchronously online for classes. There may be rare exceptions, e.g., for quizzes, but you will be notified in advance.
- Course content will be organized in the Modules section of Canvas. Usually, you will have one module per week, and the week's materials will be posted prior to Monday. I will post an Announcement to Canvas when material is posted.
- I will upload videos on course topics to YouTube and link them from the Canvas Module for the week.
- Most weeks, you will have homework due on Sunday. *Do not* underestimate the time required to complete the homework. For everyone, there is a point in the homework where you get stuck and you need help. You want that time to be Wednesday or Thursday (or before). Complete the lectures and accompanying exercises Monday-Tuesday, and begin the homework assignment as soon as possible. Waiting until Friday or later is a recipe for failure.

Prerequisite: CSC 131 (Links to an external site.) with a grade of 'P', 'C', or better

Corequisite: CSC 133 (Links to an external site.)

Student learning outcomes:

1. Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data. Data structures include: arrays, linked lists, binary trees, heaps, and hash tables.
2. Students develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.
3. Students learn to analyze and compare algorithms for efficiency using Big-O notation.
4. Students implement projects requiring the implementation of the above data structures.

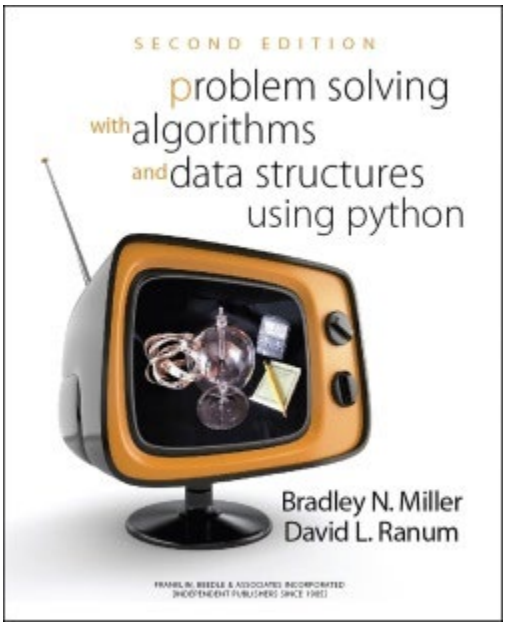
Communication Policy

There are no dumb questions. Please ask me if you are unsure about a topic, an assignment, or a course policy, or just need help. My goal is for you to learn the material and thus to be successful in this course.

I will be available virtually to answer your questions. Here is what that will look like:

- **Join the Slack Workspace (Links to an external site.)(https://join.slack.com/t/drlaymansclas-7jh3938/shared_invite/zt-i0z8a035-EppR8j6fAfxMb92Z4JXu3A (Links to an external site.)**
- **) to get help from me and your peers via text chat, screen sharing, and more.**
- You are responsible for monitoring your UNCW email account and Canvas for course updates.
- Make sure that you are receiving notifications from Canvas when an Announcement is posted. Go to Account -> Notifications and check your settings.
- **I have a question about my grade, a personal issue, or something else private:** Contact me via Direct Message on Slack, or send me email. Be aware that the UNCW email system blocks emails containing .py attachments.
- **When will you get back to me?** I will respond within 24 hours during the work week. Friday night thru Sunday I will respond within 48 hours. I will often respond quicker.
- **How quickly will you post grades and give feedback on assignments?** Within 1 week of the assignment due date.
- **How will office hours work?** Slack is the best way to get in touch with me. Please email me or send a Slack DM if you would like to set up a 1-on-1 video chat.

Textbook



Problem Solving with Algorithms and Data Structures using Python
Bradley N. Miller and David L. Ranum
ISBN-13: 978-1590282571
Free online edition (Links to an external site.)
Amazon (Links to an external site.)
Barnes & Noble (Links to an external site.)

This textbook is *required* to complete the course. The free, online edition is sufficient to complete the course. A printed text version is available from retailers if you desire.

Course Policies

Seahawk Respect Compact

We adhere to the Seahawk Respect Compact (Links to an external site.). All individuals in this class will be treated with inclusiveness, mutual respect, acceptance, and open-mindedness by all persons.

Student Academic Honor Code

All members of UNCW's community are expected to follow the academic Honor Code. Please read the UNCW Student Academic Honor Code (Links to an external site.) carefully. Academic dishonesty in any form will not be tolerated in this class.

Be familiar with UNCW's position on plagiarism as outlined in the UNCW Student Academic Honor Code (Links to an external site.). Plagiarism is a form of academic dishonesty in which you take someone else's ideas and represent them as your own. Here are some examples of plagiarism:

1. You write about someone else's work in an assignment and do not give them credit for it by referencing them.
2. You give a presentation and use someone else's ideas and do not state that the ideas are the other person's.
3. You get facts from your textbook or some other reference material and do not reference that material.

Collaboration, cheating, and personal proficiency

Collaboration: You may discuss course content with your peers. You may seek out additional resources (i.e., the Internet) to help you *understand* the course content but you may not copy code or other solutions.

You may not share code with your peers unless explicitly approved by the instructor including for assignments that you have completed. This means:

- Don't show anyone your code
- Don't look at anyone else's code
- Both of these statements apply to assignments you have already completed until given permission by the instructor. The other person may not have completed the assignment yet, and may copy from you.

All coursework is to be completed *individually* except when explicitly indicated by the instructor. If collaboration is permitted, the collaborative coursework must bear the names of all

collaborators on the team and all collaborators must contribute equally. Grading on collaborative assignments may be weighted by individual contribution and peer evaluation.

Cheating: Obtaining answers to assignments, quizzes, exams, or projects from any source other than your own brain is cheating. Any person completing work on your behalf is cheating. All coursework is to be completed individually unless explicitly stated otherwise (i.e., "collaborative"). Sharing code is cheating. Incidents of cheating will be addressed according to the policies in the Student Academic Honor Code (Links to an external site.). The minimum penalty for cheating is a grade of F on the assignment and an Academic Honor Code violation filed with the Dean of Students. Repeated or severe infractions will result in a grade of F for the course and an Honor Code violation.

Personal proficiency: You are expected to become proficient in the course content. A substantial portion of your course grade is based on timed assessments (i.e., traditional and programming quizzes). Over-reliance on peer discussion or Internet sources will lead to poor grades on these individual assessments.

Attendance

Class does not meet in person. Class does not meet synchronously online except in rare circumstances (if ever). I will notify you if there will be a mandatory, *synchronous* online session at least one week in advance, for example for a quiz. An unexcused absence for a mandatory online session for a quiz will result in a grade of F on that assessment. Failure to take the Final Exam will result in a grade of F for the course.

Grading

Your grades will be posted in the Grades section of Canvas. I will also make an Announcement when grades are posted.

You are graded cumulatively on each of the items below. These cumulative grades are then weighted.

- 35% – Programming assignments and other homework. Usually one per week due on Sunday.
- 45% – Quizzes. Timed assessments approximately one per week.
- 5% – Reading Quizzes. Low-pressure checks to make sure you are keeping up and to help you study.
- 15% – Final Exam

For example, suppose you receive a 10/15 on Assignment 1 and 18/20 on Assignment 2. Your cumulative assignment score would be 28/35. This score would be multiplied by 40% and added to the weighted scores for the assignments and quizzes. Your course letter grade will be determined by the sum of these weighted scores according to the scale below.

Change (11-05-2020): The assignment and quiz that detract the most from their respective cumulative grades will be dropped.

A [94.0,∞]
A- [90.0,94.0)
B+ [87.0,90.0)
B [84.0,87.0)
B- [80.0,84.0)
C+ [77.0,80.0)
C [74.0,77.0)
C- [70.0,74.0)
D+ [67.0,70.0)
D [64.0,67.0)
D- [60.0,64.0)
F [0.0,60.0)

Homework assignments and quizzes are due at the time and date indicated. Late submissions will receive a grade of zero. You are encouraged to submit your assignments early. There are no make-ups for assignments or quizzes that are late or incomplete for unexcused reasons (see below). Make-ups for *excused* absences will be addressed on a case-by-case basis.

Final Exam will be delivered on Canvas during finals week. Failure to take the Final Exam will result in a grade of F for the course.

- Exam opens: Wednesday, Dec 2 at 5pm
- Exam closes: Thursday, Dec 3 at 8pm.
- The exam will have a 3 hour time limit once you begin. The exam will terminate at the specified close time regardless of when you begin. So the latest you should start is Thursday, Dec 3 at 5pm.

Regrading policy: Requests to regrade must be made no later than three calendar days after the graded item is returned. For example, if a homework is returned on Monday, the request to regrade must be made no later than Thursday.

Unexcused reasons: The following is a partial list of *unexcused* reasons for failing to turn in graded material on time:

- I have a court date.
- My boyfriend/roommate/girlfriend and I are having problems.
- I have an appointment.
- I am going on vacation.
- I have to work.
- I have an admissions interview for another college.
- I got locked out of my apartment.

- I overslept.
- I couldn't find my car keys.
- My dog/cat/bird etc. got out.
- I couldn't get a parking spot.
- I was hungover/I was out late the night before.
- My alarm/roomate/friend did not wake me up.
- Traffic was bad.
- I was having one of those days so I went back to bed.

University Learning Center

You are encouraged to visit the University Learning Center (ULC) if you need extra support in mathematics, writing, or managing your schedule. The ULC's mission is to help students become successful, independent learners. Tutoring at the ULC is NOT remediation: the ULC offers a different type of learning opportunity for those students who want to increase the quality of their education. ULC services are free to all UNCW students and include the following:

- Learning Services (Links to an external site.)
- Math Services (Links to an external site.)
- Supplemental Instruction (Links to an external site.)
- Writing Services (Links to an external site.)

Students with disabilities

Students with diagnosed disabilities should contact the Office of Disability Services (910-962-7555). Please submit to me a copy of the letter you receive from Office of Disability Services detailing class accommodations you need. If you require accommodation for test-taking, make sure I have the referral letter no fewer than one week before the test.

Violence and harassment

UNCW practices a zero tolerance policy for any kind of violent or harassing behavior. If you are experiencing an emergency of this type contact the police at 911 or UNCW CARE at 962-2273. Resources for individuals concerned with a violent or harassing situation can be located at the UNCW Title IX website (Links to an external site.).

Notional Schedule

The schedule below is notional and subject to change.

ID	Date	Topic	Chapter
Week 0	19-Aug	Course Overview, PyCharm setup	
Week 1	24-Aug	131 review	1.1-1.12,
Week 2	31-Aug	Python under the Hood	
Week 3	8-Sep	Classes and Objects	1.13.1 (skip 1.13.2), 1.14-1.16

ID	Date	Topic	Chapter
Week 4	14-Sep	Analysis of Algorithms	3.1-3.10
Week 5	21-Sep	ArrayList data structure, Stacks, Queues, and Deques	4.1-4.7, 4.10-4.18
Week 6	28-Sep	Linked Lists	4.19-4.21
Week 7	5-Oct	Search Algorithms	6.1-6.4
Week 8	12-Oct	Hashing and hash tables	6.5.1-6.5.2
Week 9	19-Oct	The Map ADT	6.5.3.-6.5.4
Week 10	26-Oct	Recursion	5.1-5.5, 5.10, 5.13
Week 11	2-Nov	Sorting Algorithms	6.6-6.9, 6.11-6.13
Week 12	9-Nov	Trees, Binary Search Trees	7.1-7.3, 7.5, 7.11-7.14
Week 13	16-Nov	Binary Search Trees	
Week 14	23-Nov	???	
Week 15	30-Nov	Final exam	