

Syllabus: CS 100 Scientific Computing - Spring 2021

Class Time: MWF 9:15AM-10:05AM in Taylor 205
Website: <http://csweb.wooster.edu/hguarnera/cs100/>
Professor: Heather Guarnera (hguarnera@wooster.edu)
Office: Taylor 303
Office Hours: By appointment
Zone Intern: El Yazid Chalabi
Teaching Assistant: Fareeda Abu-Juam

Textbook: Python Programming in Context, 2nd Edition, B. N. Miller, D. L. Ranum, Jones & Bartlett Learning (ISBN-13: 978-1-4496-9939-0). Available on Safari Online.



Course Description: The purpose of this course is to show some of the connections between computer science and other disciplines such as mathematics and the natural sciences. We will study the fundamental computer science concepts for the design and implementation of solutions to problems that can be solved through approximations, simulations, interpolations, and recursive formulas. Course material includes Python programming for

- plotting functions and data
- approximating Pi using various methods
- encryption and cipher algorithms
- computing statistics with large datasets
- processing digital image and manipulating image files
- clustering analysis
- creating simulations to model more complex behavior (e.g. simulate predator-prey relationships; use fractals to simulate trees and snowflakes)

This is a hands-on course where students work in multidisciplinary groups to design and implement several small and medium scale projects.

Prerequisite: No prerequisite. Offered annually, fall and spring [MNS].

Grading: Your final grade will be calculated as follows.

10% *Reading quizzes.* There will be a total of ~18 short quizzes (roughly 5-8 questions) that will be available on Moodle. I will take your grade based on the best out of 15. Quizzes are open-book and open-notes, but they are timed, so I suggest you create notes for quick reference. It is important that you complete the assigned reading before class starts on the due date, as we will begin solving problems in Python during class time with those concepts. There are no makeup quizzes.

10% *Participation.* I encourage you to actively and respectfully participate. You will have many opportunities to do so: primarily through successful completion of programming assignments started during class, as well as asking and answering questions, attending the STEM Zone, and professional collaboration with your classmates. You will be able to accumulate over 150 participation points, but your participation grade will be taken out 150 points maximum.

20% *Homework.* Regular assignments which are primarily based on writing code to solve various problems. Typically due every Friday before class, unless otherwise stated.

20% *Exam 1.* See schedule for tentative time

20% *Exam 2.* See schedule for tentative time

10% *Response to a scientific paper.* An individual assignment where you select an article of interest and write a summary and reflection on it.

10% *Final project.* A collaborative (teams of 2 students) programming assignment designed to solve a selected problem. At the end of the semester, your team will give a presentation and demonstration of your final project.

This class uses the standard grading scale:

A	A-	B+	B	B-	C+	C	C-	D	F
93%	90%	87%	83%	80%	77%	73%	70%	60%	below


Note that the main purpose of in-class activities and homework assignments is to give students opportunities to practice what they learn. It is expected that much of your learning will come from practice! I hope that you understand the value of this work, and do not regard it solely as a grading source. With this in mind, the instructor will choose to grade only a subset of in-class activities and labs. The remaining subset could be graded partially or based on whether the work was submitted.


Pass/Fail option. The College is temporarily broadening the policies on electing a pass-fail grading structure

- Students may elect a Pass-Fail grading option for any course (including those in a major/minor)
- Special note on transcript noting unique policy changes specific to this semester regarding pass-fail counting toward the major.
- Students may elect as many courses as they wish on a Pass-Fail grading structure. Courses elected as Pass-Fail for this semester will not count toward the maximum number of Pass-Fail courses that a student may take at Wooster.


The deadline for electing a Pass-Fail grading option is one week after final grades are posted.

Course Drop. The College is temporarily extending the deadline for dropping a course. Students may drop any course by **Tuesday, April 27 @ 4:00PM**. The minimum enrollment of 3.0 credits remains in effect. Requests to drop enrollment below 3.0 credits will require additional documentation via [Other academic petitions](#).


Attendance: We work best as a learning community when everyone participates. As such, it is expected that you will attend  class at scheduled times and in accordance with health and safety protocols. If you are unable to attend class in-person on a specific day, then you are welcome to join remotely. If you are unable to join remotely, I encourage you to check the course website and get notes from a classmate to catch up on missed materials. I will communicate to you in a timely manner any changes to this schedule.

Technology: Our class works best when we use our devices to further our learning. I encourage you to only use technology  during class time to enable, rather than to distract from, our learning and community building. During class, we'll write code and connect to classmates on Microsoft Teams. Bring your laptop to every day. There are a variety of tools that will be used, including


- *Microsoft Teams* – for class meetings, video conferencing, discussions, general chat, office hours, and questions
- *Thonny* – a software development environment for programming in Python.

Recording of Classes: On occasion, I plan to record class discussions for educational purposes only so that students who  miss class can access them at a later time. Recordings will be available only to course participants on password-protected websites. No one should distribute recordings, screenshots, or other course material beyond class without express permission of all involved in the recording. I will inform those participating in person and/or remotely, and offer options for participation to protect student privacy, such as:

- Participating remotely with video camera turned off
- Participating in the chat (which is not recorded)

Communication: Communication is the key to success. Contact me as soon as possible if you are struggling with material or  if a conflict arises. The best way to contact me outside of class by coming to my office hours or on the Teams Q&A channel, using an @mention. It is so often the case that when one student has a question, several others have the same or similar question. We use Teams for Q&A so that the entire class can collectively benefit from questions, and so that your classmates can see that they are not alone in their struggle. **I encourage you to share your understanding with your classmates by answering questions as well;** you will earn participation points by doing so. If you have a private concern, such as a question about your grade, we can discuss it in a private setting.

You should allow 24 hours response time for any communication. I usually respond faster than that, but you should not count on it. Please keep this in mind when contacting me late at night or over the weekend.

Late Policy: I will do my best to grade and return assignments to you as soon as I can. Late submissions make timely grading  much more difficult. As such, late homework assignments will be subject to a 25% penalty if it is up to 8 hours late, and a 50% penalty if it is up to 24 hours late. No late assignments are accepted after 24 hours.

Accommodations: Your success in this class is important to me. We all need accommodations to learn effectively. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. You do not need to share specifics, but we can work together to develop strategies to meet both your needs and the requirements of the course, and to identify specific resources that may assist you.

Names and Pronouns. All people have the right to be addressed and referred to in accordance with their personal identity. We include pronoun introductions to avoid gender-based assumptions and to ensure that the correct pronoun is used when referring to you. I will do my best to address and refer to all students by the names and pronouns shared in class, regardless of what is listed on the roster, and I support classmates doing so as well.

In this class, we will have the chance to indicate the name that you would like to be called and, if we choose, to identify pronouns with which we would like to be addressed. The name and pronoun(s) that you use may change and, if they do, please let us know you would like us to change how we address you. If you are interested in changing your chosen name and pronoun(s) in the College of Wooster system, you can find additional information [here](#).

Academic Honesty: You are expected to know and abide by the rules of the institution as described in [The Scot's Key](#) and the [Handbook of Selected College Policies](#). Dishonesty in any of your academic work is a serious breach of the Code of Academic Integrity and is grounds for an F in this course. Such violations include turning in another person's work as your own, copying from any source without proper citation, and violating expectations for a group project.

Conflicts with Academic Responsibilities: When conflicts arise between academic commitments and complementary programs (including athletic, cultural, educational, and volunteer activities), students, faculty, staff, and administrators all share the responsibility of minimizing and resolving them. The College expects students to give the highest priority to their academic responsibilities. As a student you have the responsibility to inform me of potential conflicts as soon as you are aware of them, and to discuss and work with me to identify alternative ways to fulfill your academic commitments without sacrificing the academic integrity and rigor of the course.

Title IX: The College is committed to fostering a campus community based on respect and nonviolence. To this end, we recognize that all Wooster community members are responsible for ensuring that our community is free from discrimination, gender bias, sexual harassment, and sexual assault. In accordance with Title IX, Wooster is legally obligated to investigate incidents of sexual harassment and sexual assault that occur on our campus. Faculty who become aware of an incident of sexual violence, including harassment, rape, sexual assault, relationship violence, or stalking, are required by law to notify Wooster's Title IX Coordinator. The purpose of this disclosure is to ensure that students are made aware of their reporting options and resources for support. For more information about your rights and reporting options at Wooster, including confidential and anonymous reporting options, please visit [here](#).

Additional Resources. Please view the course website for additional links and resources, including information on Moodle, the Learning Center, Library Support, health and safety guidelines, Title IX, and discriminatory or bias-related harassment reporting. Once finished, for one extra point towards your participation, share on Teams a picture of your favorite animal. Create a new thread called "Read the syllabus" if necessary, or use an existing thread if someone already posted.

We're All Human. This has been a tough few months for all of us for many reasons. Let's all practice empathy, kindness, and understanding - towards each other and ourselves. The situation due to COVID-19, including the learning environment, is as new to me as it is to you. I have done my best to structure the course according to best practices and my own expertise, and to make the course policies fair, equitable, and humane. There is still a lot of uncertainty ahead, so we may need to make adjustments as the semester progresses. Please bear with me. Any changes will be communicated to you in a timely manner.