

CMPU 101 §53

## Computer Science I: Problem-Solving and Abstraction

Spring 2024

Tuesday 3:10–4:25 p.m.

Thursday 3:10–4:25 p.m.

Friday 3:10–5:10 p.m.

Sanders Classroom 006

Professor Gordon

[cs.vassar.edu/~cs101/3](http://cs.vassar.edu/~cs101/3)

### Overview

This course introduces fundamental concepts of computer science. Its major goal is to introduce students to the principles of systematic problem-solving through programming. We will explore the art and science of problem-solving using the computer as a tool, writing programs in Pyret – a simple yet powerful student learning language – and Python – a popular language for work across computer science and data science.

### *Prerequisites*

The course does not assume any prior programming experience. It is suitable for all students – CS majors and non-majors alike – who wish to explore the ideas of the discipline.

### *Course goals*

By the end of the semester, students should be able to:

- Develop programs that process and manipulate data in a variety of shapes, including tables, lists, and trees;

- Decide how to organize data for efficient, maintainable computational processing;
- Decompose programming tasks into solvable subtasks, informing the structure of your programs; and
- Develop good automated tests to provide confidence in a program's correctness.

Additional topics may include the social implications of large-scale data collection, retention, and use.

## Course format

The class sessions are intended to complement the material in your readings by providing an opportunity for in-depth discussion, working through examples, and the chance for you to ask questions.

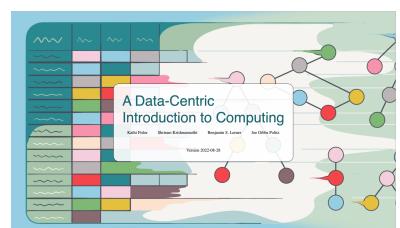
In class, please ask and answer questions! In computer science, we seldom get anything right on the first try. We see how an attempt turned out, and we try again. I want our classroom to reflect that approach as well, so please answer a question that's been posed, even if you're not sure of the answer.

The material covered each week builds on what was covered in prior weeks. As such, it's essential that you attend every lecture and keep up with the reading assignments.

The calendar with lecture notes, assigned readings and exercises, and exams is on the [course website](#) and will be updated throughout the semester.

## Textbook

*A Data-Centric Introduction to Computing*  
 Kathi Fisler, Shriram Krishnamurthi, Benjamin S. Lerner, and  
 Joe Gibbs Politz  
[dcic-world.org](http://dcic-world.org)



## Coursework and grades

To develop and assess your understanding of the ideas presented in this course, there will be weekly labs, regular homework assign-

I'm free!

ments, two quizzes, and two exams, with the second, non-cumulative exam during the final exam period. For the final grade, the elements of the course will be weighted approximately as follows:

Labs	15%
Assignments	25%
Quizzes	20%
Exams	40%

Remember that success in the course is more than just good grades. It means that you are being challenged to grow as a learner, that you are engaging actively with tasks that feed your growth, and that you are creating excellent work by completing challenging tasks with an appropriate level of support. It also means that you are building your lifelong learning skills so that once the course is over, you are better and stronger as a learner and can continue to learn new things independently.

### *Labs*

The purpose of the labs is to give you hands-on experience with the actual tools, and to clarify concepts with examples. Labs will be evaluated for completion.

Lab sessions are two hours long. Many labs can be completed in less time, and you can leave when your lab work has been checked by the instructor or a student coach. However, everybody works at different speeds, and some labs may take longer than I anticipate. If you need a bit more time, you can then finish your lab work any time before the next lab. Coaches will be available to check off your work during coaching hours; check the [schedule](#) online.

### *Assignments*

Programming assignments will expand upon the concepts introduced in class and practiced in lab. You can expect an assignment each week.

Assignments and due dates will be listed on the calendar on the course website. Programming assignments will be submitted on Gradescope and will be evaluated based on correctness and good programming style.

## *Quizzes and Exams*

There will be two quizzes, designed to give you a chance to test your understanding of the material we've covered before you get to the corresponding exam.

There will be a midterm exam, given during a lab period, and a regularly scheduled final exam. The midterm will focus on material from the first half of the semester, and the final exam will focus on material from the second half of the semester.

For each quiz or exam, you may refer to an  $8.5 \times 11$ -inch piece of paper, double-sided, with anything *hand-written* on it that you want. For exams, you will be asked to turn in any notes you use along with your finished exam.

Preparing this sheet of notes is an excellent way to study, encouraging you to consider what's important that you will want to refer to.

## *Grading*

We will be using Gradescope this term to provide feedback on your work. Homework and labs will be submitted through Gradescope, and homework and exam grades will be returned through Gradescope. As soon as grades are posted, you will be notified immediately so that you can log in and see your feedback.

We'll go over submitting on Gradescope during the first lab.

## *Late work*

For flexibility, you have five "late days" that you can use to extend the deadline of any homework assignment by 24 hours. You may use up to two late days per homework assignment.

If you know you won't be able to submit an assignment, talk to me. If you're experiencing a major problem – medical, psychological, family, etc. – that is interfering with your ability to complete your class work, you should talk with your class advisor, the Dean of Studies, Counseling Services, or Health Services, who will recommend appropriate accommodations to all of your professors, who honestly want you to succeed.

## Collaboration policy

The goal of the course is to gain an understanding of computer science, not to compete with each other. Indeed, in CS as a field, collaboration is the norm. As such, you're encouraged to discuss class material with other CMPU 101 students when reading, studying, and thinking about the problems.

*Labs* For labs, you have the option to work with a classmate. If you do so, you are expected to design and implement the solutions together. You should submit a single lab with both names on it and will receive the same grade. Note that submitting work you have not contributed to fairly or do not understand is academic dishonesty.

*Assignments* For homework assignments, you are permitted to discuss high-level ideas with other students, but you must produce your code and other responses on your own.

In particular, the following activities are *not* allowed when working on homework assignments:

- Sharing code files with another student for any reason,
- Sitting next to another student while writing up solutions, looking at what the other is typing,
- Sending code for a homework question to a classmate “just so they can look at it to figure out how to do the problem”,
- Obtaining a solution online or from someone not in the course,
- Leaving your work in unprotected directories or services (including GitHub, GitLab, or CourseHero) where other students can find them, or
- Showing a classmate your code so they can help you find or debug an error.

However, the following scenarios are fine:

- Asking the professor or coaches for help,
- Classmates discussing an assignment at a general level (rather than the code) – discussing what the question is asking, what topics it draws on, and other similar non-code issues,

- Asking a classmate what general causes of a particular error message might be, or for debugging strategies, without showing them your code.

*Quizzes and exams* These must be completed individually. Do not discuss the contents with anyone but the professor until grades are released.

## Generative AI

Generative AI – such as ChatGPT, Bing Chat, or Anthropic Claude – can be powerful tools to help you in writing and debugging programs. At times during the semester, we may encourage you to try these tools in class and in lab. For this class, you may also use generative AI on your own when you are studying or working on homework assignments.

If you use generative AI while working on a homework assignment, your submission must include a comment acknowledging the use of these tools and include a transcript showing your interactions. (This will help us to understand both the difficulties students are having in the class and the ways that generative AI can help them!)

Quizzes and exams will be taken in person, on paper, without the use of AI, so be careful that you are using generative AI to *help* you learn rather than as a way to *avoid* learning!

## Academic integrity

Please read the CS department's [guide](#) to academic integrity. In particular, note that:

[cs.vassar.edu/integrity](http://cs.vassar.edu/integrity)

- 1 You may not copy code written by anyone else (e.g., a classmate, a friend, an online source, a book). (You are permitted to use the code provided by the instructor or included in the assigned readings!)
- 2 Using code or other material from sources as “inspiration” and submitting highly derivative solutions is considered copying. (That is, you can’t “paraphrase” someone else’s work!)
- 3 You may not post a public question that contains any part of your code.

- 4 You may consult online resources as part of your coursework, but you may not copy code from an online source. If you get an idea of how to solve a problem from an online source, include a citation near the top of your source code, e.g.,

```
# Consulted online source for list comprehensions:  
# https://diveintopython3.net/comprehensions.html
```

You do not need to include a similar notation if you consulted with a classmate; we expect that – just don't share code!

If you haven't already done so, you should read "[Going to the Source](#)", available from the Dean of the College website. Note that the guidelines that apply to writing in general apply equally to the writing of computer programs. In particular, *copying anyone else's code without attribution is plagiarism*.

Quoting from Chapter X, "In suspected cases of plagiarism, the instructor prepares a written statement of complaint to the Academic Panel." Please don't put yourself or your professor in that position. When in doubt, *stop* and ask me first.

## Communication and getting help

I encourage all students to participate in class discussions. In return, I will make myself available to answer questions, listen to concerns, and talk to any student about topics related to the class. I welcome your feedback throughout the semester about how the course is going.

*Instructor availability*    Office hours will be listed on the [department website](#). If you need to meet at a different time, send me a message.

Please come to office hours! Coming to office hours does not send a signal that you are behind or need "extra help"; on the contrary, the most successful students are usually those who come to office hours early and often.

I typically only check email and other messages between 9 a.m. and 5 p.m. on weekdays. If you send a message that needs a response during those times, you can expect to get a response within six hours (often much sooner). Otherwise, you can expect one when I'm back online.

*Student coaches* In addition to faculty office hours, student coaches will be available during scheduled labs and at other times, typically including evenings and weekends. The [coaching schedule](#) will be published online.

Coaches aren't here to give you answers, of course, but to be your fellow computer scientists thinking through a tough problem with you. Expect them to ask more questions than they answer.

## Academic accommodations

Academic accommodations are available for students who are registered with the Office for Accessibility and Educational Opportunity (AEO). Students in need of disability (ADA/504) accommodations should schedule an appointment with me early in the semester to discuss any accommodations for this course that have been approved by the Office for Accessibility and Educational Opportunity, as indicated in your AEO accommodation letter.

## Diversity and inclusion

In an ideal world, science would be objective. However, much of science is subjective and is historically built on a small subset of privileged voices. There may be both overt and covert biases in the material due to the lens with which it was written, even though the material is primarily of a scientific nature. Since integrating a diverse set of experiences is important for a more comprehensive understanding of science, please contact me if you have any suggestions to improve the quality of the course materials.

I would like to create a learning environment that supports diversity of thoughts, perspectives, and experiences, and honors your identities.

- If you have a name and/or set of pronouns that differ from those that appear in your official records, please let me know!
- If you feel that your performance in the class is being impacted by your experiences outside of class, please don't hesitate to contact me. If you prefer to speak with someone outside of the course, you can contact your class advisor or the Dean of Studies.

- I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.

## Title IX

Vassar College is committed to providing a safe learning environment for all students that is free of all forms of discrimination and sexual harassment, including sexual assault, relationship abuse, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. Vassar College has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more.

Please be aware all Vassar faculty members are “responsible employees,” which means that if you tell me about a situation involving sexual harassment, sexual assault, relationship abuse, or stalking, I must share that information with the Title IX Coordinator. Although I have to make that notification, the Title IX office will only provide outreach by email. You will control how your case will be handled – you don’t have to read or respond to the email, and it is completely up to you whether to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone privately, you can contact any of the following on-campus resources:

- Counseling Service ([counselingservice.vassar.edu](mailto:counselingservice.vassar.edu), 845-437-5700)
- Health Service ([healthservice.vassar.edu](mailto:healthservice.vassar.edu), 845-437-5800)
- Rachel Gellert, Director of Support Advocacy and Violence Prevention ([savp.vassar.edu](mailto:savp.vassar.edu), 845-437-7863)
- SART (Sexual Assault Response Team) advocate, available 24/7 by calling the CRC at 845-437-7333 and asking for SART

The SAVP website ([savp.vassar.edu](http://savp.vassar.edu)) and the Title IX section of the EOAA website ([eoaa.vassar.edu/title-ix](http://eoaa.vassar.edu/title-ix)) have more information, as well as links to both on- and off-campus resources.

## Acknowledgments

This course – and this syllabus – is based in large part on work by other professors, especially Kathi Fisler and colleagues at Brown University. The statement on diversity and inclusion is adapted from Monica Linden.