Syllabus

Principles of Programming Languages

Instructor	Prof. Daniel Barowy
Office	TPL 306
Email	dbarowy@cs.williams.edu
Office Hours	Mondays, 4-5pm in TPL 306 and
	Fridays, 1:30–2:30pm in the Ward Lab (TBL 301)
	or by appointment
	in TPL 306
Lectures	Monday and Thursday 1:10–2:35pm
	in Schow Library Classroom 030B
Web Page	http://williams-cs.github.io/cs334-f23-www

Readings

- **(Required)** CSCI 334 Course Packet

Course Objectives

Why do we have so many programming languages? Many of them, like Java and C#, do more or less the same thing. Others, like C and Prolog, are wildly different. A key insight is that programming languages are designed for humans, not for computers. Another important insight is that they are often designed for certain tasks. In this class, we will explore language designs and how different design choices can affect human productivity or program correctness. We will also "get under the hood" of a programming language, which will give you deep insights into how they work.

Outcomes. At the end of this course, you should be able

1. to know how to quickly learn an unfamiliar programming language;

2. to understand the inner workings of programming languages; and finally

3. to speak the "language of languages," so that you can talk about computation independently of a given programming language.

An important component of this course is discussing alternative approaches for solving the same problem. Because programming languages are intrinsically tied up in (and motivated by) programming problems, we will not only investigate features of languages, but also the problems that led to their development.

Workload

Expect to spend roughly 10 hours per week on this class and its activities. Students in previous sections tell me that this amount of time is an accurate estimate of the time they spent. I strongly encourage you to block out time to work on CS334 problem sets. Starting early will also significantly reduce your stress level.

Website

I post lecture slides and example code to the course website shortly after class, and add links to labs as they are assigned. Be sure to check the website regularly.

Assignments

There are two kinds of assignments in this class.

1. **Reading assignments** ask you to read some material in the course packet.

2. **Labs** are a combination of problem sets with written answers and programming assignments (due Sunday evenings by 10pm).

We we will also engage in weekly in-class activities designed to help you check your understanding of the readings. These activities count toward your class participation grade. Assigned readings are posted on the course website and are listed as prerequisites in the current lab handout. Labs are assigned weekly, typically at least a week ahead of the due date and will be posted to the course website.

All lab work should:

- be completed and pushed to `git` no later than 10pm on the due date;

- include source code for questions involving programming;

- be typeset using LaTeX for non-programming questions (e.g., proofs); and

- list any student partners with whom you discussed the problems (see Honor Code handout).

Labs will not be accepted on paper or via email.

Lab Resources for Assignments

You are strongly encouraged to use the Computer Science Department's "UNIX lab" computers for the programming problems. The UNIX lab is located in TCL 312. Lab computers are preconfigured with all of the required software. If you are not familiar with our lab environment, please speak with me or a TA so that we can bring you up to speed. You may also see either Kelsey Gura or Lida Doret to reset your Unix password if you have forgotten it.

You may use your personal computer for assignments, but please be advised that if you do so, technical support is your own responsibility.

Exam and Final Project

There will be a midterm exam covering both lectures and readings. Your final evaluation will be a group programming project and presentation.

Grading

Your final grade will be determined according to the following formula:

Midterm:	25%
Final Project:	25%
Lab assignments:	35%
Class participation:	15%

$$\text{final grade} = \text{midterm exam} \times 0.25 + \text{final project} \times 0.25 + \text{lab mean} \times 0.35 + \text{participation} \times 0.15$$

Lab letter grades are converted as follows:

A	95%
B	85%
C	75%
D	65%
F	0%

Numeric scores are converted as follows:

$\geq 93\%$	A
$\geq 90\%$ and $< 93\%$	A-
$\geq 87\%$ and $< 90\%$	B+
$\geq 83\%$ and $< 87\%$	B
$\geq 80\%$ and $< 83\%$	B-
$\geq 77\%$ and $< 80\%$	C+
$\geq 73\%$ and $< 77\%$	C
$\geq 70\%$ and $< 73\%$	C-
$\geq 67\%$ and $< 70\%$	D+
$\geq 63\%$ and $< 67\%$	D
$\geq 60\%$ and $< 63\%$	D-
$< 60\%$	F

If you are spending lots of mental energy worrying about grades, please see me and we can discuss your worries in private. I try to give you a great deal of control over your final grade, and while I can't promise you an A, any student who earnestly applies themselves to the challenges in this course and learns from their mistakes has little to worry about.

Late Work

You are expected to turn in all assignments in a timely manner to receive full credit. Nevertheless, I understand that sometimes events conspire to make on-time homework assignment a challenge. Each student may use a maximum of **three free late days** during the course of the semester. A late day permits you to hand in a lab up to 24 hours late, without penalty, no questions asked. **You may use at most one late day on a given assignment.**

To take a late day, be sure to fill out the late day form (https://forms.gle/nPh4rvt8gZUxm4Xo9). Without prior arrangement, late assignments will be penalized at a rate of **20% per day**.

━━━ Resubmissions ━━━

You may find that occasionally, you do not do as well on an assignment as you had hoped. That's OK! Revisiting a mistake is one of the best ways to learn. To encourage you to engage in this practice, you are permitted to resubmit two assignments during the semester. This policy includes labs 1–9 and the midterm exam, but not the final lab or the final project.

A resubmission allows you to earn back **up to 50% of the missing points**. For example, if you received a 75% on an assignment, you may earn up to 87.5% upon resubmission.

Resubmissions must be submitted in the following manner:

1. They must be submitted before the end of the final exam reading period.
2. They must include <u>both</u> the original work <u>and</u> the new submission.
3. They must be accompanied with a <u>typed</u> document, written in plain language, that explains, for every correction:
   (a) <u>what</u> the error was in the original work,
   (b) <u>how</u> you fixed the error, and
   (c) <u>why</u> the new version is correct.

Please note that resubmissions <u>must be typed or they will not be accepted.</u> Detailed instructions for submitting a resubmission will be distributed via a separate handout.

━━━ Illness ━━━

As much as we would all like to put COVID-19 behind us, sadly, it is still a serious concern. I consider **your health to be your top priority**. Falling ill is not your fault, and your grade should not suffer as a result. If you become ill, whether it is COVID-19 or not, I ask that you inform me as soon as possible and **please refrain from attending class**. Consider your semester "on hold" with no negative consequences until you recover. We will negotiate adjusted due dates once you are feeling better.

On the prevention side of things, you are welcome to wear a mask as your comfort level dictates. Whether you wear a mask or not, please respect the choices made by your peers.

━━━ Help!!! ━━━

There are many resources available when you need them. You are encouraged to discuss any questions, concerns, difficulties, or thoughts about the course with me. In addition, TAs are available to help you with challenges you face as you work through the course material and lab assignments. You are welcome at any time to approach me to ask for clarification on assignments or to discuss your problem-solving process. Don't wait until you are stuck and frustrated to speak with one of us!

If you find yourself facing challenges beyond the typical, please do not stay silent. Talk to your instructor, a friendly face from the Dean's Office, or one of the many professionals across campus who stand ready to help. All faculty and staff at Williams are bound by the Family Educational Rights and Privacy Act (FERPA) to maintain the privacy of your educational records. We understand that difficulties arise, and we are prepared to help you.

You will never be penalized for seeking help!