CS 558 Programming Languages - Winter 2022 - Syllabus

Instructor:
Andrew Tolmach
120-23 FAB
e-mail: tolmach@pdx.edu
Office Hours: on zoom; please email for an appointment

Course web page: [http://web.cecs.pdx.edu/~apt/cs558](http://web.cecs.pdx.edu/~apt/cs558)
Course WebLab entry page: [https://weblab.tudelft.nl/psu-cs558/Winter+2022/](https://weblab.tudelft.nl/psu-cs558/Winter+2022/)

Catalog Description

A comparative study of programming languages, with emphasis on underlying issues in language implementation. Detailed study of features and concepts of both conventional imperative languages, including object-oriented languages, and less conventional paradigms, including functional programming. Emphasizes "hands on" experience in using various languages, and working with implementations of simplified languages that illustrate the concepts under study.

Learning Objectives

The student who successfully completes this course should:

- Know the fundamental building blocks and structure of programming languages, including expressions, statements, functions, and modules, and be able to analyze a language into its features.
- Be able to read and manipulate common formalisms for language syntax and semantics.
- Recognize and program in different language styles, including the object-oriented and functional paradigms.
- Understand the role of types in languages and be able to explain how type checking works in general and on specific programs.
- Understand procedural and data abstraction and analyze how they are supported in specific languages.

Recommended Prerequisites

Ability to program fluently in at least two high-level languages, preferably including Java, C#, C++, or a similar statically-typed object-oriented language.

Texts

There is one required textbook:


You are also recommended to have a reference book for the Scala programming language, which we will use in lab assignments, such as


A few additional required readings and optional reference sources will be provided on the course web page.
Course Format and Requirements

• This course is “attend anywhere.” Lectures will be delivered in a classroom and simultaneously streamed on Zoom.
  – You may choose to attend in person or via Zoom. You can switch freely between these modes from one class meeting to the next.
  – You are expected to attend live (i.e. at the scheduled course time) using one mode or the other. However, attendance is not required or recorded.
  – Lectures will be recorded via Zoom and made available via the course web page.
  – Lecture slides in pdf will be available on the course web page shortly in advance of the lecture.
  – Each lecture will have a set of review and enhancement questions for self-study, with answers provided. These are not to be handed in.

• Most lectures have an associated reading assignment in the Scott textbook or other source. Readings should be done prior to the lecture.

• Each reading assignment has an associated review quiz. These quizzes should be completed prior to lecture. These will be very lightly graded; you will receive most or all points just for attempting an answer. Quizzes are administered using the WebLab system (see below).

• Homework (lab) assignments are due weekly, on Tuesdays one hour prior to lecture. Assignments are distributed and collected via the WebLab system.

• Midterm and final exams. Each exam will be taken at home, open book, under relaxed time conditions, again using the WebLab system.

• After completion of each exam, you must participate in a short one-on-one Zoom meeting with the instructor. Your exam grade will be based on both what you submit and on what you communicate during the one-on-one meeting.

• In addition, you must participate in a short introductory one-on-one Zoom meeting with the instructor, to be scheduled during the first two weeks of class.

Grading

Grading will be as follows: 5% on reading review quizzes (after dropping the poorest two scores); 45% on lab assignments; 25% on midterm, 25% on final. In addition, in order to pass the course, you must participate in the three required one-on-one Zoom meetings with the instructor. Grades will be curved.

WebLab

Lab assignments, exams, and quizzes will be distributed and collected using a web-based system called WebLab, hosted by Delft Technical University in the Netherlands. You can access this system using any browser.

To start using WebLab, take these steps:

1. Go to https://weblab.tudelft.nl
2. Click the “Sign in” button at the top right of the page.
3. Fill out the form in the right column to register. Please use your pdx.edu Email address. Use the same First and Last Name as your PSU registration name; we need to be able to correlate the name you give here with the official PSU roster. You can use whatever you wish for your Username. Remember your password!
4. Now go to [https://weblab.tudelft.nl/psu-cs558/Winter+2022/](https://weblab.tudelft.nl/psu-cs558/Winter+2022/) (you can also navigate there from the top-level WebLab page by selecting the PSU-CS558 tile from the collection of courses and then selecting the “Winter 2022” edition).

5. Click on the “Enroll” button.

6. Read and understand the course rules and mark the check box saying that you have done so.

7. Mark the “For grade” check box.

8. Click on the (rightmost) “Enroll” button.

9. You should now find yourself back on the course home page. Bookmark this page for future use.

10. You can stay signed in indefinitely, but if you are leaving your browser or logging out of your computer altogether, you can click the “Sign out” button in the top right corner. The next time you want to re-enter the system, go to the bookmarked page and click “Sign in” in the top right corner, then enter your username (or email address) and password on the left side of the page.

You may also wish to install Scala (version 2.12) directly on your own computer in order to have more flexibility for working with programs (in particular, for using the interactive interpreter). You can download Scala from [https://www.scala-lang.org/download](https://www.scala-lang.org/download). It is also available on the CS department’s linuxlab machines. You should already have accounts on these machines; see [https://cat.pdx.edu/users/getting-help/for-new-students/](https://cat.pdx.edu/users/getting-help/for-new-students/) for details.

**Staying In Touch**

Keep an eye on the course web page and on the News Archive in WebLab for important late-breaking announcements.

You can use the WebLab discussion comment facility to direct questions to the instructor. Also feel free to send mail to the instructor, including to request a Zoom appointment.

For more free form discussion among students, there is a slack channel #cs558-winter2022 on [https://cs-pdx.slack.com](https://cs-pdx.slack.com); this will be lightly monitored by the instructor.

**Individual Work**

All exams must represent your own, individual work. Plagiarism or use of unauthorized materials or devices in the exam is considered cheating. Inability to explain something that you claim to have written will be considered evidence that you didn’t write it. Cheating on an exam will result in an automatic zero grade, and the initiation of disciplinary action at the University level.

For the weekly lab assignments, you are allowed to work collaboratively with other students unless otherwise specified. However, to obtain credit for the lab portion of your grade, you must submit a solution yourself, under your own WebLab account. Doing the labs is intended to help you learn the material; thus it is strongly recommended that you and your collaborators each create and type in a solution individually. *Do not, under any circumstances, copy another person’s code without their permission and submit it as your own.* Also, please do not make your solutions publicly available (e.g. in Slack posts, on GitHub, etc.).

**Classroom Requirements for All Students and Faculty Due to Covid-19**

The University has established rules and policies to make the return to the classroom as safe as possible. It is required for everyone to follow all the Return to Campus rules and policies. To participate in this class, PSU requires students to comply with the following.
Masks Required at all Times in Classroom

- Wear a mask or face covering indoors at all times (see https://www.pdx.edu/covid-19-response/masks). Your mask or face covering must be properly worn (fully covering nose and mouth and tight fitting). Mesh masks, face shields, or face covering that incorporates a valve designed to facilitate easy exhalation are not acceptable. Because a mask must be worn in the classroom, there should be no eating or drinking in the classroom. If you have a medical condition or a disability that prevents you from wearing a mask or cloth face covering, you must obtain an accommodation from the Disability Resource Center (DRC) (https://www.pdx.edu/disability-resource-center/) to be exempt from this requirement.
- CDC, State, and County guidance does not limit class size for in-person instruction or require physical distancing.

Vaccination

Be vaccinated against COVID-19 and complete the COVID-19 vaccination attestation form (https://www.pdx.edu/covid-19-response/vaccinations). Those students with medical or nonmedical exemptions or who will not be on campus at all must complete the process described on “COVID-19 Vaccine Exemption Request Form” to establish those exemptions.

Health Check, Illness, Exposure or Positive Test for COVID-19

- Complete the required self-check for COVID-19 symptoms before coming to campus each day (see https://www.pdx.edu/health-counseling/sites/g/files/zn1dh771/files/2021-04/Student_COVID_Check_4.19.21.pdf).
- If you are feeling sick or have been exposed to COVID-19, do not come to campus. Call SHAC to discuss your symptoms and situation (503.725.2800). They will advise you on testing, quarantine, and when you can return to campus.
- If you test positive for COVID-19, report your result to SHAC (https://docs.google.com/forms/d/e/1FAIpQLSfu4kQinNOxFLVPoF0IsYZ90e4vyyefE3R0Z4Dmz-ADI1MOlsYQ/viewform) and do not come to campus. SHAC will advise you on quarantine, notification of close contacts and when you can return to campus.
- Please notify the instructor should you need to miss a class period for any of these reasons so that we can discuss strategies to support your learning during this time.
- If the instructor becomes ill or need to quarantine during the term, either they or the department chair will notify you via PSU email about their absence and how course instruction will continue.

Failure to Comply with Any of these Rules

The University has given the instructor the authority to require your compliance with these policies. If you do not comply with these requirements, the instructor may ask you to leave the classroom or may need to cancel the class session entirely.

In addition, failure to comply with these requirements may result in a referral to the Office of the Dean of Student Life to consider charges under PSU’s Code of Conduct. A student found to have violated a university rule (or rules) through the due process of student conduct might face disciplinary and educational sanctions (or consequences). For a complete list of sanctions, see Section 14 of the Student Code of Conduct & Responsibility (https://www.pdx.edu/dean-student-life/psu-code-student-conduct-and-responsibility).
Guidance May Change

Please note that the University rules, policies, and guidance may change at any time at the direction of the CDC, State, or County requirements. Please review the University’s main COVID-19 Response webpage (https://www.pdx.edu/covid-19-response) and look for emails from the University on these topics.

Title IX Reporting Obligations

Portland State is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibit gender or sex-based discrimination and sexual misconduct (including harassment, domestic and dating violence, sexual assault, and stalking). We expect a culture of professionalism and mutual respect in our department and class. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the Office of Equity and Compliance (https://www.pdx.edu/diversity/equity-compliance) or the Office of the Dean of Student Life (https://www.pdx.edu/student-life/dean-of-student-life). Please be aware that members of the faculty have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination to PSU’s Title IX Coordinator, the Office of Equity and Compliance or the Dean of Student Life and cannot keep information confidential. If you would rather share information about sexual harassment or sexual violence to a confidential employee who does not have this reporting responsibility, you can contact a confidential advocate at 503-725-5672 or by scheduling on-line (https://psuwrc.youcanbook.me) or another confidential employee found on the sexual misconduct resource webpage (https://www.pdx.edu/sexual-assault/get-help).

Disabilities

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations.

If you already have accommodations from the DRC, please contact the instructor so we can discuss them.

The DRC is located in 116 Smith Memorial Student Union, Suite 116. You can also contact the DRC at 503-725-4150 or, drc@pdx.edu. Visit the DRC online at https://www.pdx.edu/disability-resource-center.

Recording

We will use technology for virtual meetings and recordings in this course. Our use of such technology is governed by FERPA, the Acceptable Use Policy, and PSU’s Student Code of Conduct. A record of all meetings and recordings is kept and stored by PSU, in accordance with the Acceptable Use Policy and FERPA. The instructor will not share recordings of your class activities outside of course participants, which include your fellow students, TAs/GAs/Mentors, and any guest faculty or community based learning partners that we may engage with. You may not share recordings outside of this course. Doing so may result in disciplinary action.