

# CS 558 Programming Languages - Fall 2023 - Syllabus

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Course web page: <http://web.cecs.pdx.edu/~apt/cs558>

Course WebLab entry page: <https://weblab.tudelft.nl/psu-cs558/Fall+2023/>

## 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:

- Michael L. Scott, *Programming Language Pragmatics, 4th ed.*, Morgan Kaufmann, 2016.

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

• Odersky, Spoon, and Venner, *Programming in Scala*, Artima Press, 4th edition, 2020. The first edition of this book is available free on-line at <http://www.artima.com/pins1ed>. Although a little out of date with respect to recent Scala versions, using the first edition should be fine for this course.

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

## Course Format and Requirements

- This course will meet in person. You are expected to attend all class meetings, but attendance will not be recorded and is not an explicit component of your grade.
  - Lectures will be recorded via Zoom and made available via the course web page. Note that recording quality may not be good, especially if the whiteboard is being used.
  - 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.
- There will be midterm and final exams, conducted in the classroom.
- You must participate in two short one-on-one Zoom meetings with the instructor, one at the beginning of the term and one after the midterm exam.

## 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 two required one-on-one Zoom meetings with the instructor

Course letter grades will be assigned on a sliding scale. There are no absolute percentages associated with the different grades.

## 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/Fall+2023/> (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 “Fall 2023” 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>. It is also available on the CS department’s linuxlab machines. Version 2.12 can be obtained by running `addpkg` and selecting the `scala` package. You should already have accounts on these machines; see <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-fall2023` on <https://cs-pdx.slack.com>; this will be monitored by the instructor and teaching assistant.

## 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.).

## 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 503-894-7982 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. You can also contact the DRC at 503-725-4150 or, [drc@pdx.edu](mailto:drc@pdx.edu). Visit the DRC online at <https://www.pdx.edu/disability-resource-center>.

## **Recording**

We will use technology for 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.