Course Information

Course Homepage:
go/cs313 or http://www.cs.middlebury.edu/~schar/courses/cs313-f21

Time and Place:
MWF 11:15am-12:05pm, 75 Shannon **202**

Professor:
Daniel Scharstein
75 Shannon 214
schar@middlebury.edu

Office Hours:
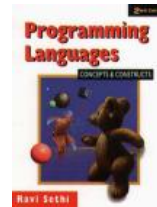Tue/Wed/Thu 1-2pm and by appointment

Tutor:
Hirona Arai
harai@middlebury.edu

Readings:
There is no required textbook. I will provide links to online readings.

The following textbook is optional:
Programming Languages: Concepts and Constructs, 2nd ed.
Ravi Sethi, Addison Wesley, 1996

Course Description

The goal of this course is to systematically explore concepts and features of programming languages. We will focus on four major programming paradigms: procedural, object-oriented, functional, and logic programming languages. Along the way you will get a taste of several languages, including Pascal, C, Smalltalk, Ruby, ML, Scheme, Prolog, and a few others, depending on student interest. While all of these are theoretically equivalent in computing power, in practice each lends itself best to performing certain kinds of tasks. By taking this course you will expand your practical knowledge of computer science and also gain new insights into concepts already familiar to you.

Prerequisites: CS 202. I expect knowledge of Python (from CS 1xx), Java (from CS 201), and basic C (from CS 202).

Topics

The following is a **tentative** schedule of topics to be covered in this course. Readings (optional) refer to the text by Sethi.

Week	Date	Topic	Reading
1	9/13-17	Intro, History, Grammars	Ch 1, 2
2-3	9/20-10/1	**Procedural programming** Data types, parameter passing, scope, procedure activation (C, Pascal)	Ch 4, 5
4-6	10/4-22	**Object-oriented programming** Class structure, information hiding, inheritance (Smalltalk, Ruby)	Ch 6, 7
	10/21	**Midterm exam**	
7-9	10/25-11/12	**Functional programming** Recursion vs. iteration, higher order functions, lambda expressions, procedure evaluation (Scheme, ML)	Ch 8, 9, 10
10-11	11/15-12/3	**Logic Programming** Unification, prolog execution model, rule order and goal order (Prolog)	Ch 11
12	12/6-10	Advanced topics	

Lectures and quizzes

Lectures will be a mix of in-person and flipped-classroom; the latter delivered via videos and assigned reading. Be prepared that video lectures will require about an hour of your time *before* the regular class time. I will post the videos at least 24 hours in advance. Both types of lectures will include online quizzes that test your understanding of the material. These quizzes are mandatory and their deadline will depend on the class modality: one hour before class for video lectures, and later the same day for regular lectures. Missed quizzes cannot be made up.

Hyflex format

This class is taught in hyflex format to accommodate remote learners via zoom. However, participation via zoom is **not** an option for students on campus, who must participate in person. If you have a compelling reason to participate via zoom (e.g., quarantine), please request permission via email at least one hour before class.

Assignments, Exams, and Grading

There will be weekly homeworks, consisting of programming assignments and/or written assignments. Usually, homeworks will be posted on Wednesdays, and will be due the following Wednesday at noon. Evening tutoring will be offered before due dates. Late work will not be accepted. However, each student is allotted two 24-hour extensions to use for any homework assignment during the term. No more than one extension may be taken per homework. If you have not completed an assignment, you should still turn in whatever you have for partial credit. In extenuating circumstances (e.g., sickness, personal crisis, religious holidays), please get in touch as early as possible, and I may be able to grant additional extensions in consultation with your dean.

Your final grade will be based on quizzes (20%), homeworks (40%), a midterm exam (15%), and a final exam (25%). The lowest HW score will only receive 25% weight. The midterm exam is scheduled for Thursday, 10/21. The final exam will be self-scheduled during the exam period. Both exams will be open notes take-home exams.

Tutoring

Evening tutoring will be offered typically for 2 hours the day before homework is due. Please check the main course page for the current tutoring schedule and location.

Inclusive Classroom Environment

I welcome students from all backgrounds and aim to create an inclusive learning environment where diversity and individual differences are respected and recognized as a source of strength. This is a team effort and I expect you to join me in fostering such an environment. If you experience or witness any problematic behavior or other impediments to an inclusive learning environment, please talk to me or email me, or report it via our anonymous [CS departmental climate feedback form](#).

Collaboration Policy and Honor Code

You are encouraged to talk with other students about the course, form study groups, and to help each other. Unless otherwise instructed, feel free to discuss problem sets with other students and exchange ideas about how to solve them. However, there is a thin line between collaboration and plagiarizing the work of others. Therefore, it is required that **you must compose your own solution to each assignment**. In particular, while you may discuss strategies for approaching the programming assignments with your classmates and may receive debugging help from them, **you are required to write all of your own code**. It is unacceptable (1) to write a program together and turn in two copies of the same program or (2) to copy code written by your classmates. This implies that you should never have in your possession a copy of all or part of another student's work. It is your own responsibility to protect your work from unauthorized access. If an assignment is designated a *group project*, then the above rules apply to a group. That is, you are allowed to collaborate on the assignment with your partners, but work with others is restricted as discussed above. Of course, **all quizzes and exams must be entirely your own work and you may not collaborate with anyone**.

When working on homework problems, it is perfectly reasonable to consult public literature (online sources, books, articles, etc.) for hints and techniques. However, **you must reference any sources that contribute to your solution**. It is also OK to borrow code from textbooks, from materials discussed in class, and from other sources as long as you give proper credit. Assignments and solutions from previous terms are not considered to be part of the "public" literature, and consulting problem set solutions from previous terms constitutes a violation of the Honor Code.

If you are uncertain how the Honor Code applies to a particular assignment, please ask me. The Department of Computer Science takes the Honor Code seriously. Violations are easy to identify and will be dealt with promptly.

ADA information

Students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the [Disability Resource Center](#). Please contact ADA Coordinators Jodi Litchfield (litchfie@middlebury.edu or 802-443-5936) or Peter Ploegman (pploegman@middlebury.edu or 802-443-2382) for more information. All discussions will remain confidential.