

CS:3820 Programming Language Concepts

The University of Iowa, Spring 2016

Course Syllabus

Instructor:

Dr. Adrien Champion
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Teaching assistant:

Richard Blair
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Lectures

Every Tuesday and Thursday 2pm to 3:15pm, 106 GILH.

Office hours

Adrien Champion	Tue 3:30pm-5:30pm and Thu 3:20pm-5pm	101A MLH
Richard Blair	<i>TBA</i>	<i>TBA</i>

Prerequisites

CS2230 Computer Science II: Data Structures, and
CS2630 Computer Organization or
CS2820 Object-Oriented Software Development

Communication

This term we will be using **Piazza** for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, we encourage you to post your questions on Piazza.

<https://piazza.com/uiowa/spring2016/cs3820/home>

The **lectures** and this syllabus are available on bitbucket on the repository

<https://bitbucket.org/AdrienChampion/plc/overview>

Announcements on Piazza will let you know when the lectures are pushed to the bitbucket repository. Still, **we recommend** you *follow* the repository to be notified as soon as possible of corrections, updates ...

Course overview

In this class we will look at the design of modern programming languages. We discuss a notion of *abstract machine* and implementation of a language. We will also define and study the concepts found in most

languages: memory management, type checking, abstraction mechanisms ...

We will use the **Rust** programming language in class and for most assignments / projects. Rust is a new, ambitious programming language based on relatively recent concepts. The result is a challenging, powerful language with features such as built-in parallelism, very strong static guarantees, powerful constructs, impressive efficiency. Rust benefits from a large community considering its young age. Rust was originally introduced by Mozilla and follows a completely open development process: many users end up contributing directly to the standard / official libraries.

No prior familiarity with any of these topics or Rust is assumed in this class.

Outline

1	Abstract Machines	4	Memory management	7	Control abstraction
2	Describing a language	5	Names and environment	8	Structuring data
3	Foundations	6	Control structures	9	Data abstraction

Textbooks and readings

There is no required textbook although we recommend

| *Programming Languages: Principles and Paradigms*, Maurizio Gabbrielli and Simone Martini
available in an electronic edition at the library.

Assignments, Exams and Grading

You will be graded for the following work, which make up the respective percentage of your final grade:

- 4 Homework Assignments (Programming Assignments), 40%
- In-class Midterm Exam, 20%
- Final Project, 30%
- Micro assignments, 10%

Programming assignments will generally have a late deadline of two days. The penalty for turning in a programming assignment between 0 and 24 hours after the deadline 15%, and 25% for more than that. 48 hours after the deadline, solutions will be posted and no late work accepted.

A micro assignment is a very small assignment, intended to take 20-30 minutes at most. Think of it as a take-home quiz, intended to reinforce concepts from class. Micro assignments will be posted at the end of some classes and are due right at the start of the following class (within first 3 minutes). Micros will not be accepted late.

Collaboration Policy

The collaboration policy for programming assignments is that high-level discussion of problems is OK, but detailed collaboration on solutions is prohibited unless explicitly allowed. This means that unless explicitly

allowed, you should not look over another person's code from the class (this includes writing the code together). You are not allowed to check that your solution makes sense by reading another person's code. Solutions whose similarity is too great to be a coincidence will be considered for possible academic integrity violation. No collaboration at all is allowed on micro assignments. I will protect your rights to a fair evaluation in this course through enforcement: cases of suspected cheating will be reported to the Dean's office, as required by CLAS policy.

Teaching Policies & Resources

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences (Operations Manual, III.15.2, k.11).

Accommodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See <http://sds.studentlife.uiowa.edu/> for more information.

Academic Honesty

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

CLAS Final Examination Policies

The final examination schedule for each class is announced by the Registrar generally by the fifth week of classes. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Office of the Sexual Misconduct Response Coordinator for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.