# Course Syllabus for CECS 424: Organization of Programming Languages Fall 2014

Department of Computer Engineering and Computer Science,
California State University, Long Beach

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## Course Description

Understanding the variety of programming languages and the design trade-offs between current programming language paradigms. Comparison of programming languages in their design, implementation, and run-time supports. Includes programming projects.

Pre-requisites: CECS 326 and CECS 328

## Course Topics

We will study the *how's* and *why's* of programming language design and implementation to a much greater level of detail than is possible in lower-level courses. We will cover essential programming language concepts like binding time, type systems, abstraction mechanisms, reflection, recursion, memory management, lambda calculus, and message passing. We will also contrast different language paradigms (procedural, object-oriented, functional, llogic, concurrent) and complete programming assignments in each. Particular emphasis will be placed on the functional programming paradigm, and its concerns of higher-order functions and immutable state.

| Week(s) | Topic | Chapters | Assignments |
|---|---|---|---|
| 1 | Introduction | 1 | Homework 1 - C<br>Lab 1 - Memory Allocation |
| 1-2 | Imperative Programming | | |
| 2 | Grammar and Syntax | 2.1 | |
| 2-3 | Binding and Allocation | 3 | |
| 4 | Scripting Languages | 13 | Homework 2<br>Lab 2 - Python |
| 5 | Control Flow | 6 | |
| 6 | Data Types | 7 | |
| 7-8 | Subroutines | 8 | Homework 3<br>Lab 3 |
| 8-9 | Objects | 9 | |
| 10-11 | Functional Programming | 10 | Homework 4<br>Lab 4 - Clojure |
| 12-13 | Concurrent Programming | 12 | |
| 14-15 | Other topics | ? | Homework 5<br>Lab 5 |

## Course Materials

**Required**: *Programming Language Pragmatics Third Edition*, Scott, M. Morgan Kaufmann Publishers, 2009.

Supplementary material outside of the class textbook will be presented and included in tests, learning activities and programming projects. Links to additional material will be posted on the course website.

## Grading

Standard grading scale: 90%+ for A, 80-89% B, 70-79% C, 60-69% D, 59% and lower F.

**Components:**

- Homework - 20
- Labs - 20
- Midterm - 30
- Final - 30

**Rules:**

**Homework** will be assigned weekly, and will mostly involve written work.

- Homework assignments are due **at the beginning of class** on their due date.
- Homework may include writing code, doing research, debugging programs, and other disciplines.
- Homework will be *strictly* graded on correct answers to the questions.

**Labs** are short programming assignments designed to be completed during the class' allotted lab time; one will be assigned each week.

- Lab assignments will include a programming portion, and some may also include problem solving, writing, or other disciplines.
- All labs will have an assigned due date, and must be turned in to me by the end of the class lab period on the due date. I will only accept lab submissions in-person, and not via email or other medium. You are welcome to work on lab assignments at home, but assistance will only be provided during class time and office hours.
- Most labs will be submitted with a printout of your code. Some will require additional deliverables.
- Labs will be graded on correct answers to required deliverables.

**Midterms** are closed-notes and closed-book. Please use the bathroom BEFORE taking the exam. BATHROOM BREAKS DURING EXAMS ARE NOT ALLOWED. MAKE-UP EXAMS ARE ONLY PROVIDED WHEN THERE IS DOCUMENTED EVIDENCE OF ACCIDENT OR ILLNESS.

Late penalties: projects and homework will be assessed a 10% late penalty *per calendary day* they are late. **I do not accept assignments via email or fax**. If you want to turn something in on

a day that we do not meet, you may do so at the CECS Department Office.

### Computer Software

You will be responsible for finding and installing any software needed to complete programming assignments in the languages we study. I will make sure there is always a free option available.

### Accessibility

DISABLED STUDENT SERVICES is a student support program within the Student Services Division. Our mission is to assist students with disabilities as they secure their university degrees at California State University, Long Beach. We provide services to over 13,000 students each semester. Over 3,000 students with disabilities have graduated from C S U Long Beach with support from our program.

The Disabled Student Services office is located on the 2nd floor in the Administration Building, room SS/AD 270.

**It is your responsibility to notify the instructor** in advance of any need for special accommodation due to a university verified disability.

### Attendance and Drops

Attendance is not required, but all material presented during lecture or lab is fair game for exam questions. I will not redo a lecture for people who missed it the first time. If you miss a class day, it is your responsibility to obtain notes from someone who attended. I do not give "pop" quizzes.

Absences will not excuse you from turning in lab or homework assignments on time. You are given plenty of time to complete these assignments, so pace yourself and plan to finish them early in case an emergency causes you to miss a day of class.

I will honor drop requests where permitted by university policy.

### Academic Honesty

All assignments in this class are designated as *individual work only*. You may discuss ideas with others, but you may not share code, algorithms, or solutions with *any* individual on *any* of the class assignments. **Anything with your name on it must be written by you.** If you cannot complete an assignment on your own, the correct approach is to ask *me* for help during lab or office hours.

You are not in high school, where cheating is "against the rules" but not actually punished. If I catch you sharing code, discussing solutions, exchanging test cases, or in any way collaborating about one of the assignments, I will assign you an "F" grade in the course and report your cheating to the administration. This goes for **all parties involved**. This is for your own good. You will not make it in this discipline if you cannot write difficult code on your own.

At random points in the semester you may be asked by me to explain parts of an assignment you have turned in. If you are unable to answer simple questions about your code to my satisfaction, you will be given a 0 grade for the assignment, and I will investigate whether you have been violating the restrictions above.

All instances of plagiarism or cheating, no matter how slight, will result in a course grade of "F" and a report to the administration.