

San Jose State University

CS 152 - Programming Languages

Cay S. Horstmann

Spring 2018

Section 3: MW 10:30-11:45 SCI 311

Section 4: MW 12:00-13:15 SCI 311

For office hours and contact information, please visit <http://www.sjsu.edu/faculty/cay.horstmann>.

The Piazza site for this course is at <http://piazza.com/sjsu/spring2018/cs152sections3and4/home>.

Calendar

January 24

First day of class | Slides

January 29

Functional Programming 1 | Homework 1 / Prerequisite quiz due

January 31

Functional Programming 2

February 5

Higher Order Functions 1 | Homework 2 due

February 7

Higher Order Functions 2

February 12

Higher Order Functions 3 | Homework 3 due

February 14

Parsing 1

February 19

Parsing 2 | Homework 4 due

February 21

No class

February 26

Parsing 3 | Homework 5 due

February 28

Parsing 4

March 5

Racket 1 | Homework 6 due

March 7

Racket 2

March 12

Racket 3 | Homework 7 due
March 14
Types 1
March 19
Types 2 | Homework 8 due
March 21
Midterm exam
March 26 -30
Spring Break
April 2
Compiling 1
April 4
Compiling 2
April 9
Compiling 3 | Homework 9 due
April 11
JavaScript 1
April 16
JavaScript 2 | Homework 10 due
April 18
Prolog 1
April 23
Prolog 2
April 25
Project updates
April 30
Prolog 3 | Homework 11 due
May 2
Project updates
May 7
Prolog 4 | Homework 12 due
May 9
Project presentations
May 14
Last day of instruction | Project presentations
May 16
0945-1200 Section 4 Final
May 21
0945-1200 Section 3 Final

Description

The course goal is to study programming language design, with an emphasis on the functional paradigm.

Topics covered:

- Programming language syntax and semantics.
- Data types and type checking.

- Scope, bindings, and environments.
- Functional and logic programming paradigms, and comparison to other paradigms.
- Extensive coverage of a functional language.

For the official catalog description, please visit <http://info.sjsu.edu/web-dbgen/catalog/departments/CS-courses.html>.

Prerequisites

CS 151 or CMPE 135. If you are registered for the class, you *must* email me your answers to the prerequisite quiz by 23:59 of the second day of class, or I will drop you from the class for failure to fulfill the prerequisites.

Specifically, the following skills are assumed:

- A working knowledge of Java, including inner classes, reflection, exception handling, generics, concurrency
- Data structures: lists, trees, hash tables
- Windows and Unix basics, as covered in the CS46A and B labs: shell usage, environment variables, shell scripts
- The ability to design, implement, test, and debug programs in an object-oriented language, involving the creation of at least 10 classes and interfaces

Textbook

There is no required text.

Student Learning Outcomes

Upon completion of this course, the successful student will be able to

- Have a basic knowledge of the history of programming languages
- Have a basic knowledge of the procedural, object-oriented, functional, and logic programming paradigms
- Understand the roles of interpreters, compilers, and virtual machines
- Critique the design of a programming language
- Read and produce context-free grammars
- Write recursive-descent parsers for simple languages, by hand or with a parser generator
- Understand variable scoping and lifetimes
- Write interpreters for simple languages that involve arithmetic expressions, bindings of values to names, and function calls
- Understand type systems
- Understand the implementation of procedure calls and stack frames
- Produce programs in a functional programming language in excess of 200 LOC

Course Policies

Adding the Course

To add the course, take the prerequisite quiz. You must use your add code within 24 hours, or the add code will be reassigned to someone else.

Time Spent

As per Policy Recommendation S12-3 (www.sjsu.edu/senate/S12-3.pdf) , success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course for instruction or preparation/studying or course related activities.

This is a 3-unit/15-week class, so you should spend 135 hours per semester or 9 hours per week on this class.

Individual Work

All homework and exams must be *your own individual work*. You may *never* copy anything from anyone without attribution, with one exception—you may copy from the textbook. For homeworks and exams, you may not copy anything from any other student at all. You may not share any of your homework or exam work with any students prior to submission. Except for the team project, you may not collaboratively produce results in pairs or teams.

Publicly Viewable Work

Your class work (including homework, exam, and project work) may be viewable by other students of this course. Your grades will not be viewable by others.

Laptops

You will be required to bring a laptop to all (!) classes and exams. You need to have the following tools installed on your laptop:

- Java 8
- Scala IDE 4.7
- A bash shell.
- Software instructions, scripts, technical support, and so on, will be provided for Linux. You may wish to install a Linux virtual machine. If you choose to use another operating system, you are responsible for making any necessary adaptations.

Grading Policy

A midterm (15% per exam) and a final exam (30%).

Exams cannot be made up, except for reasons of illness, as certified by a doctor, or documentable extreme emergency. Makeup exams may be oral.

Weekly programming assignments (35%)

Late work is not accepted, and there is no extra credit or makeup work.

Group project (15%)

The topic and team are determined by the instructor. Late work is not accepted, and there is no extra credit or makeup work.

Class Attendance, Preparation and Participation (5%)

Each student is expected to be present, punctual, and prepared at every scheduled class session.

University policy F69-24 (<http://www.sjsu.edu/senate/docs/F69-24.pdf>) states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

You will be graded on participation in class and online discussions, and your performance on quizzes that check the assigned pre-class activities.

You will receive a letter grade for each of the exams, the finals, the total homework performance, and the total participation in labs/discussions/quizzes. Letter grades are obtained by adding and curving the numeric scores. When determining a curve, the cutoffs are guided by the university definitions (http://www.sjsu.edu/registrar/students/grades-grades_changes/grade_symbols_and_values/) for letter grades:

- A+, A, A- excellent
- B+, B, B- above average
- C+, C, C- average
- D+, D, D- below average
- F failure

Letter grades are converted into number grades, as specified by the registrar (http://www.sjsu.edu/registrar/tutorials/grade_values.html), except that an A+ is counted as 4.3, and weighted with the percentages given in the Course Requirements section. The weighted average is rounded towards the nearest letter grade, which is your class grade.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on the Office of Graduate and Undergraduate Programs' Syllabus Information web page (<http://www.sjsu.edu/gup/syllabusinfo/>).