

**San José State University**  
**Department of Computer Science**  
**CS252, Advanced Programming Language Principles, Section 01**  
**Spring Semester, 2016**

**Course and Contact Information**

<b>Instructor:</b>	Thomas Austin
<b>Office Location:</b>	MH 216
<b>Email:</b>	thomas.austin@sjsu.edu
<b>Office Hours:</b>	Monday/Thursday noon-1pm
<b>Class Days/Time:</b>	Monday/Wednesday 10:30-11:45am.
<b>Classroom:</b>	SC 311
<b>Prerequisites:</b>	CS 152 or instructor consent. Familiarity with functional programming is assumed.

**Course Description**

(Copied from <http://info.sjsu.edu/web-dbgen/catalog/courses/CS252.html>). Language design and paradigms, including concepts underlying functional, logic, object-oriented and parallel paradigms. Theoretical foundations, including lambda calculus, denotational and axiomatic semantics. Proofs of program correctness. Programming projects emphasizing different aspects of language design.

**Learning Outcomes**

**Course Learning Outcomes (CLO)**

Upon successful completion of this course, students will be able to:

1. CLO1: Read and write operational semantics
2. CLO2: Read and write formal type systems
3. CLO3: Write moderately sized Haskell applications
4. CLO4: Read and review research papers in the field of programming languages

**Required Texts/Readings**

**Textbook**

Required materials: We will use a variety of online resources, including:

- "Learn You a Haskell for Great Good", available at <http://learnyouahaskell.com/>.
- "Eloquent JavaScript", available at <http://eloquentjavascript.net>

- More references TBD.

## Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

*This class will involve 5 significant programming assignments, a midterm & a final (no notes), and a final project & presentation. Lastly, there will be labs for most days of class.*

*For the class project, you may work alone or with a partner at your discretion. Note that more will be expected of your project if you have a partner.*

*Labs are graded complete/incomplete. As long as you attempt and submit the lab, you will get full credit.*

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) at <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.”

## Grading Policy

1. 30% -- Homework assignments
2. 20% -- Midterm
3. 20% -- Final (Tuesday, December 15. 9:45-noon)
4. 20% -- Project
5. 10% -- Participation (labs)

Assignments are due by 11:59 PM Pacific Time on the specified day. **Late homework assignments will not be accepted.**

Nominal grading scale:

Percentage	Grade
92 and above	A
90 - 91	A-
88 - 89	B+
82 - 87	B
80 - 81	B-
78 - 79	C+
72 - 77	C
70 - 71	C-
68 - 69	D+
62 - 67	D
60 - 61	D-

Note that “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.” See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

## University Policies

### General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See [University Policy S90–5](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the [SJSU catalog](http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html), at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

### Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

### Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor’s permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
  - It is suggested that the greensheet include the instructor’s process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
  - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

### **Academic integrity**

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

### **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

# CS 252 Advanced Programming Language Principles, Spring 2016, *Tentative* Course Schedule

The official schedule is in [Canvas](https://sjsu.instructure.com/) at <https://sjsu.instructure.com/>. The schedule will be adjusted throughout the course. **It is your responsibility to check the schedule before each class.** However, here is a rough outline of what we will cover:

## *Tentative Course Schedule*

Week	Date	Topics
1	August 23	Course introduction
2	August 28	Introduction to Haskell
2	August 30	Haskell, continued
3	September 4	<b>LABOR DAY – NO CLASS</b>
3	September 6	Higher order functions
4	September 11	<b>GUEST LECTURE – TOPIC TBD</b>
4	September 13	Big step operational semantics
5	September 20	LaTeX and project overview
5	September 25	Algebraic data types & functors
6	September 27	Applicative functors
6	October 2	Monads
7	October 4	Parser generators
7	October 9	Review session
8	October 11	<b>***MIDTERM (tentative date – check Canvas)***</b>
8	October 16	Lambda calculus
9	October 18	Introduction to JavaScript
9	October 23	Scoping in JavaScript
10	October 25	Event-based programming
10	October 30	Macros & Sweet.js
11	November 1	Type systems and small-step semantics
11	November 6	JavaScript Object Proxies
12	November 8	Simply typed lambda calculus
12	November 13	Introduction to Ruby
13	November 15	Just-in-time (JIT) compilation

Week	Date	Topics
13	November 20	Ruby blocks
14	November 22	Language-based security mechanisms
14	November 27	TBD
15	November 29	TBD
15	December 4	Project presentations
16	December 6	Project presentations
16	December 11	Final review
Final Exam	December 15	***SCI 311, 9:45-noon***