SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Advanced Programming Language Principles

CS 252

Spring 2026 Section 01 In Person 3 Unit(s) 01/22/2026 to 05/11/2026 Modified 01/23/2026

Contact Information

Prof. Thomas H. Austin

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Office: MacQuarrie Hall 216

If office hours need to be rescheduled or moved online, I will put notice here: http://www.cs.sjsu.edu/~austin/office-hours-updates.txt.

Office Hours

Monday, 3:00 PM to 4:00 PM, MacQuarrie Hall 216

Thursday, 11:00 AM to 12:00 PM, MacQuarrie Hall 216

Course Information

Monday, Wednesday, 10:30 AM to 11:45 AM, Duncan Hall 515

Course Description and Requisites

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.

Prerequisite(s): CS 152 and Graduate standing. Allowed Declared Major: Computer Science, Bioinformatics, Data Science. Or instructor consent.

Letter Graded

Classroom Protocols

Please show up to class on time. If students arriving late becomes a problem, I will start classes with pop quizzes.
Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on my faculty web page at http://www.cs.sjsu.edu/~austin/cs252-spring26/ and on Canvas.
You are responsible for regularly checking with the messaging system through Canvas to learn of any updates.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

Upon successful completion of this course, students will be able to:
1. Read and write operational semantics
2. Read and write formal type systems
3. Write moderately sized Haskell applications
4. Read and review research papers in the field of programming languages

Course Materials

Learn You a Haskell for Great Good

Author: Miran Lipovaca
Availability: https://learnyouahaskell.github.io/

Eloquent JavaScript

Author: Marijn Haverbeke
Edition: 4th
Availability: https://eloquentjavascript.net/

Other Resources TBD

Course Requirements and Assignments

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.

Exams and homework must be done individually. **If two students turn in overly similar code, both get a zero, and both may be reported for plagiarism.**

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.

For labs, you may work with others if you wish. Be forewarned, exam questions are often similar to lab questions. If you do not understand your lab solution, you are not likely to succeed on the exams.

✔ Grading Information

30% -- Homework assignments
20% -- Midterm
20% -- Final
20% -- Project
10% -- Participation (labs and pop-quizzes)
Assignments are due by 11:59 PM Pacific Time on the specified day. Late homework assignments will not be accepted.

Nominal grading scale:
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-
59 and below F

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

The final exam is May 13th, 10:45-12:45.

For the official class schedule, please see Canvas.
Tentative schedule by class session:

1. Course introduction
2. Introduction to Haskell
3. LaTeX
4. Big-step operational semantics
5. Higher order functions
6. Small-step operational semantics
7. Algebraic data types, kinds, and type classes
8. Functors
9. Applicative functors
10. Monads
11. Parser generators
12. Midterm review session
13. Midterm
14. Lambda calculus
15. Introduction to JavaScript
16. Event-based programming
17. JSLint and TypeScript
18. Type systems
19. Metaprogramming and JavaScript object proxies
20. Simply typed lambda calculus
21. Virtual machine lab
22. Introduction to Ruby
23. Ruby meta programming
24. Rust
25. Ethereum Solidity
26. Inform 7
27. Project presentations
28. Project presentations
29. Final review session