San José State University
Department of Computer Science
CS 152, Programming Paradigms, Sections 1 & 2, Fall 2020

Course and Contact Information

Instructor:	Rula Khayrallah
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Office Hours:	Monday 3-4 PM, Wednesday 3-5 PM, Thursday 3-4 PM
Class Days/Time:	Section 1: Monday/Wednesday 10:30AM - 11:45AM Section 2: Monday/Wednesday 1:30PM - 2:45PM
Classroom:	Online via Zoom
Prerequisites:	CS 151 or CMPE 135 with a grade of C- or better

Course Format

The course will be conducted online over Zoom with synchronous lectures and interactive activities.
We'll use iClicker to gather your feedback and check understanding during the lecture. iClicker helps me understand what you know, gives everyone a chance to participate, and allows you to review the material after class.

Canvas Course Site

Course materials such as syllabus, lecture notes, assignments and exams can be found on the Canvas Leaning Management System course website at http://sjsu.instructure.com. You are responsible for regularly checking with Canvas to learn of any updates.

Course Description

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.

Course Goals

Upon successful completion of this course, students will be able to:
1. Understand programming language design.
2. Achieve competence in a functional programming language.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:
1. Have a basic knowledge of the history of programming languages.

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

Reference Textbooks (available online)

Teach Yourself Scheme in Fixnum Days, Dorai Sitaram: http://ds26gte.github.io/tyscheme/index.html
Learn You a Haskell for Great Good! by Miran Lipovača: http://learnyouahaskell.com/
Learn Prolog Now, by Patrick Blackburn, Johan Bos, and Kristina Striegnitz:
http://lpn.swiprolog.org/lpnpage.php?pageid=online

Course Requirements and Assignments

Homework Assignments:

Homework assignments will be posted and submitted on Canvas. For full credit, they must be submitted by the posted due date and time. A detailed grading rubric is provided for all programming assignments. Please make sure you read and follow the grading rubric to ensure full credit.
Some assignments will be individual work. Others will be team assignments. I will make it clear whether the assignment is an individual assignment or a team assignment.
All work submitted on individual assignments must be your own. You may not share or copy code or answers from fellow students or from the web. Infractions will be detected and will lead to an automatic 0. If someone else copies your work, with or without your permission, you will be held responsible.
For team assignments, teams will consist of two students. The work must be done by both team members and both team members will receive the same grade. Teams may not share or copy code from other teams or from the web. Both team members will receive a 0 if that happens regardless of who copied or shared the work.

Exams:

We'll have 3 online exams in the semester, the last being the final exam.
The first two exams are scheduled during our regular class time as follows:
Exam 1: Wednesday, September 23
Exam 2: Wednesday, October 28
The final exam is cumulative and is scheduled according to the SJSU Final Exam Schedule.
Final Exam Section 1: Monday, December 14, 9:45AM-12:00PM
Final Exam Section 2: Tuesday, December 15, 12:15PM-14:30PM

Proctoring Software and Exams

Exams will be proctored in this course through Respondus Monitor and LockDown Browser. If cheating is suspected the proctored videos may be used for further inspection and may become part of the student's disciplinary record. Note that the proctoring software does not determine whether academic misconduct

occurred, but does determine whether something irregular occurred that may require further investigation. Students are encouraged to contact the instructor if unexpected interruptions (from a parent or roommate, for example) occur during an exam.

Academic Dishonesty

Students who are suspected of cheating during an exam will be referred to the Student Conduct and Ethical Development office and depending on the severity of the conduct, will receive a zero on the assignment or a grade of F in the course. Grade Forgiveness does not apply to courses for which the original grade was the result of a finding of academic dishonesty.

Class Participation:

You are expected to attend all class meetings as you are responsible for all the material discussed. Since active participation is essential to ensure maximum benefit, we'll use iClicker to give everyone a chance to participate. The iClicker participation points may be used to give your final grade in the course a slight boost.

Workload:

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Grading Information

Determination of Grades

The final grade in the course will be calculated based on the following percentages:
Homework Assignments: 40%
Exam 1: 15%
Exam 2: 15%
Final Exam: 30%

The iClicker participation points may be used to give your final grade a slight boost. Students with the highest score will get 1 bonus point. Students who violate the academic integrity policy are not eligible.
No extra credit options will be given.

Late Work

Late assignments will be accepted with a 1-point penalty for each day or partial day late. Late days include weekend days. For example, an assignment due on Monday by 5 PM will incur a penalty of 1 point if submitted at 8AM on Tuesday. Everyone gets two free 'late days' for the semester. No submissions will be accepted more than 2 days late.

Grade Scale

The letter grade will be determined based on the following scale:

A+ = 98% - 100%	A = 93% - 97%	A- = 90% - 92%
B+ = 87% - 89%	B = 83% - 86%	B- = 80% - 82%
C+ = 77% - 79%	C = 73% - 76%	C- = 70% - 72%
D = 60% - 69%		

F = below 60

Classroom Protocol

Please join the virtual class meeting on time and be ready to ask questions, contribute answers and participate in all class activities.

- Mute Your Microphone: To help keep background noise to a minimum, make sure you mute your microphone when you are not speaking.
- Be Mindful of Background Noise and Distractions: Find a quiet place to "attend" class, to the greatest extent possible.
  - Avoid video setups where people may be walking behind you, people talking/making noise, etc.
  - Avoid activities that could create additional noise, such as shuffling papers, listening to music in the background, etc.
- Position Your Camera Properly: Be sure your webcam is in a stable position and focused at eye level.
- Limit Your Distractions/Avoid Multitasking: You can make it easier to focus on the meeting by turning off notifications, closing or minimizing running apps, and putting your smartphone away (unless you are using it to access Zoom).
- Use Appropriate Virtual Backgrounds: If using a virtual background, it should be appropriate and professional and should NOT suggest or include content that is objectively offensive or demeaning.

Recording Zoom Classes

This course will be recorded for instructional purposes. The recordings will only be shared with students enrolled in the class through Canvas. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording).

Students are not allowed to record without instructor permission
Students are prohibited from recording class activities, distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

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 Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/ . Make sure to review these policies and resources.

CS 152 Programming Paradigms, Fall 2020, Course Schedule

Please note that this schedule is subject to change with fair notice. Any changes will be announced in class and posted on the Canvas course site.

Tentative Course Schedule

Week	Date	Topics	Homework
1	Aug 19	Course Logistics	HW 1 due Aug 24
2	Aug 24	Historical overview, computational paradigms	
2	Aug 26	Language definition, language design criteria	
3	Aug 31	Functional Programming, Scheme	HW 2 due Sep 8
3	Sep 2	Scheme: list processing, special forms	
4	Sep 7	Labor Day – No class	
4	Sep 9	More Scheme: recursion, higher order functions	HW 3 due Sep 14
5	Sep 14	Haskell: polymorphism, type classes	HW 4 due Sep 21
5	Sep 16	Haskell: pattern matching	
6	Sep 21	Haskell: currying, delayed evaluation	HW 5 due Sep 28
6	Sep 23	Exam 1	
7	Sep 28	Language translation	
7	Sep 30	Lexical analysis and parsing, context-free grammars	HW 6 due Oct 12
8	Oct 5	Operator precedence and associativity, ambiguity	
8	Oct 7	Recursive-descent parsing	
9	Oct 12	Attributes, bindings and scope	HW 7 due Oct 21
9	Oct 14	Symbol tables and environments, name resolution	
10	Oct 19	Procedures and procedure semantics	
10	Oct 21	Closures and dynamic environments	
11	Oct 26	Data types	
11	Oct 28	Exam 2	
12	Nov 2	Type equivalence, type checking, type conversion	
12	Nov 4	Static vs dynamic typing	
13	Nov 9	The Logic Paradigm	
13	Nov 11	Veterans Day – No class	
14	Nov 16	Prolog	HW 8 due Nov 30
14	Nov 18	Prolog	
15	Nov 23	Control structures	
15	Nov 25	Thanksgiving – No class	
16	Nov 30	Control structures	
16	Dec 2	Object Oriented Paradigm	
17	Dec 7	Review	
Final Exam	Dec 14	Section 1: 9:45AM-12:00PM	
	Dec 15	Section 2: 12:15PM-2:30PM	