

Greensheet

CS 154: Formal Languages and Computability
Fall 2018, Sections 01, 02, and 03

San José State University
Department of Computer Science

Instructor Info

Name	Ahmad Yazdankhah	My name is difficult to pronounce!
Office	MH 413	MacQuarrie Hall Building, Room #413
Email	ahmad.yazdankhah@sjsu.edu	Please don't use my personal email if you have it!
Website *	Under construction!	Our official educational web tool is Canvas at https://sjsu.instructure.com/
Phone	(408) 924-5060	Email is the best way to communicate!
Office Hours	TR 7:15pm – 9:15pm	By appointment please!

* Course materials such as handouts, notes, assignment instructions, etc. can be found on Canvas Learning Management System website at <http://sjsu.instructure.com>. You are responsible for regularly checking with its messaging system (or other communication system as indicated by the instructor) to learn of any updates.

Class Info

	Section 01	Section 02	Section 03
Meeting time	TR 4:30pm – 5:45pm	TR 6:00pm – 7:15pm	TR 3:00pm – 4:15pm
Classroom	SCI 311	SCI 311	SCI 311
Course Number	49193	49194	51126

General Events of Semester

Description	Day of Week	Month	Day #	Comment
First day of instruction	Tuesday	August	21	
Last day to drop	Friday	August	31	
Last day to add	Monday	September	10	
Daylight saving time	Sunday	November	4	
Holiday	Thursday	November	22	Thanksgiving
Last day of instruction	Monday	December	10	December 6 th for TR classes
Final Examinations	Wed-Fri, Mon-Tue	December	12-14, 17-18	Look at the syllabus at page 5 for detail
Grades due from faculty	Friday	December	21	End of semester

For academic events of this semester, please refer to the course [syllabus at page 5](#).

Course Brief Info

Catalog Description

Finite automata, context-free languages, Turing machines, computability.

Prerequisites

Math 42	Discrete Mathematics	Grade C- or better
CS 46B	Introduction to Data Structure	Grade C- or better

The Department of Computer Science strictly enforces prerequisites.

If you are not already pre-enrolled, you must attend the first day of the class and let your instructor know and fill out the provided document. If the class is not full, the permission codes will be provided to the requesters based on the priorities. More information will be given in the first day of the class.

Please note that any student who does not show up during the first two class meetings, may be dropped by the instructor.

Required Text

Peter Linz, "An Introduction to Formal Languages and Automata," 5th edition, Jones & Bartlett Learning, ISBN-13: 978-1449615529

Further Readings

The references at the end of each lecture note

Course Detail Info

Course Learning Outcomes (CLO)

1. The basic concepts and applications of formal languages, grammars, and automata
2. Different types of automata machines such as: finite accepters, pushdown, and Turing machines
3. Different classes of formal languages
4. The concepts of deterministic and nondeterministic automata
5. The concepts of regular languages, regular expressions, regular grammars, their properties, and the relationship between them
6. The concept and application of context-free grammars
7. The basic concepts of computability and complexity

Student Learning Outcomes

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

1. Analyze and design deterministic and non-deterministic machines for various formal languages.
2. Describe regular languages in terms of regular expressions and vice versa.
3. Construct grammars for some formal languages.
4. Analyze and design pushdown automata for some formal languages.

5. Construct and use context-free grammars.
6. Analyze and design Turing machines for some formal languages.
7. Turn non-deterministic finite automata into deterministic ones.
8. Use the pumping lemma to show that some formal languages are not regular or not context-free.
9. Describe the properties of various automata and formal languages.
10. Describe decidability and classify basic problems as decidable or undecidable.
11. Describe computability and complexity of problems.

Examinations and Evaluations

- Every week, there would be a short quiz and there would also be two midterms, and a final exam.
- All examinations would cover from the beginning of the semester.
- All examinations would be closed book.

Grading Information

Assignments	10%
Project	15%
Quizzes (10 quizzes)	30%
Midterm #1	10%
Midterm #2	15%
Final	20%
Total	100%

Nominal Grading Scale

From	To	Grade
97	100	A+
92	96.99	A
90	91.99	A-
88	89.99	B+
82	87.99	B
80	81.99	B-
78	79.99	C+
72	77.99	C
70	71.99	C-
68	69.99	D+
62	67.99	D
60	61.99	D-
0	59.99	F

To practice time management, late submissions will lose 20% of the total assignment score and an additional 20% for each 24 hours afterward.

Final Grade

- Your final grade can be adjusted depending upon your level and quality of participation in the class activities. Note that "participation" is not equal to "attendance".
- If the FINAL grades of the class are not normal, then I might curve the grades. So, it is not the case that I'd curve all exams and assignments individually.

Workload

- Success in this course is based on the expectation that students will spend **at least 6 – 10 hours per week** for:
 - working on the assignments.
 - preparation for the exams (quizzes, midterms, and final).
 - working on the term project.
- More details about student workload can be found in [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf), available at <http://www.sjsu.edu/senate/docs/S16-9.pdf>.

Classroom Protocol

- **Be on time! Coming late is disruptive.**
- My classes are always interactive. So, participate in the class' activities as much as you can.
- **Ask good questions** and answer the questions (in class and in the forum) as much as you can and **get extra credit** for them!
- **Cell phones should be in silent mode and should be kept in your pocket or backpack**, and should NOT be used during the lectures.
- **Laptops should remain closed until I inform you that it is needed for a particular activity.**
- **Instant messaging, e-mailing, texting, tweeting, etc. are strictly forbidden in my class.**
- **Attendance** is recommended, but is not mandatory, except for exam dates.
 - 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.** If a student has been out of school for one or more days, he/she should report to his instructors upon his/her return to inquire about making up the work. Students who know in advance that they will miss one or more classes should inform their instructors about their plans."

Consent for Recording of Class and Public Sharing of Instructor's Material

- 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.

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](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>.

Course Schedule

Note: this is a tentative schedule and is subject to change but with fair notice.

Day#	Date	Lec#	Topics	Exams
1	08/21	1	Greensheet; A big picture of the course; Who is your professor?	
2	08/23	2	Mathematical preliminaries (part 1);	
3	08/28	3	Mathematical preliminaries (part 2);	
4	08/30	4	Formal Languages (part 1);	Quiz 1
5	09/04	5	Formal Languages (part 2); Finalizing enrollments;	
6	09/06	6	Deterministic finite automata (part 1);	Quiz 2
7	09/11	7	Deterministic finite automata (part 2);	
8	09/13	8	Deterministic finite automata (part 3); Preparing development environment	Quiz 3
9	09/18	9	Deterministic finite automata (part 4); Review for midterm 1;	
10	09/20		Midterm 1	Midterm 1
11	09/25	10	Midterm 1 solution; Nondeterministic finite automata (part 1);	
12	09/27	11	Nondeterministic finite automata (part 2);	Quiz 4
13	10/02	12	Nondeterministic finite automata (part 3);	
14	10/04	13	Regular languages;	Quiz 5
15	10/09	14	Pushdown automata (part 1);	
16	10/11	15	Pushdown automata (part 2);	Quiz 6
17	10/16	16	Turing machines (part 1);	
18	10/18	17	Turing machines (part 2); Term project assignment	Quiz 7
19	10/23	18	Other Models of Turing machines; Review for midterm 2;	
20	10/25		Midterm 2	Midterm 2
21	10/30	19	Midterm 2 solution; Regular expressions (part 1);	
22	11/01	20	Regular expressions (part 2);	Quiz 8
23	11/06	21	Grammars (part 1);	
24	11/08	22	Grammars (part 2);	Quiz 9
25	11/13	23	Grammars (part 3);	
26	11/15	24	Non-regular languages (part 1);	Quiz 10
27	11/20	25	Non-regular languages (part 2);	
28	11/22		Holiday - Thanksgiving	
29	11/27	26	Introduction to computability;	
30	11/29	27	Introduction to complexity (part 1); Term project due date;	
31	12/04	28	Introduction to complexity (part 2);	
32	12/06		Review for final;	

Final exam	Section 01 (TR 4:30pm – 5:45pm)	Section 02 (TR 6:00pm – 7:15pm)
Date and Time	Friday, December 14 @ 2:45pm – 5:00pm	Thursday, December 13 @ 5:15pm – 7:30pm
Venue	SCI 311	SCI 311

Final exam	Section 03 (TR 3:00pm – 4:15pm)
Date and Time	Monday, December 17 @ 2:45pm – 5:00pm
Venue	SCI 311