

Greensheet

CS 154: Formal Languages and Computability
Spring 2020, Sections 02, and 03

San José State University
Department of Computer Science

Instructor Info

Instructor	Ahmad Yazdankhah	My name is difficult to pronounce!
Office Location	MH 212	MacQuarrie Hall, Room #212
Email	ahmad.yazdankhah@sjsu.edu	
Website *	Under construction!	Our official educational web tool is Canvas available at https://sjsu.instructure.com/
Phone	(408) 924-5060	Email is the best way to communicate with me!
Office Hours	TR 7:15pm – 9:15pm	By appointment please! I'll be in the class room DH 450.

* Course materials such as handouts, notes, assignment instructions, etc. can be found on [Canvas Learning Management System](https://sjsu.instructure.com/) available 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 02	Section 03
Meeting Time	TR 3:00pm – 4:15pm	TR 4:30pm – 5:45pm
Classroom	DH 450	DH 450
Course Number	27399	27400

General Events of Semester

Description	Day of Week	Month	Day #	Comment
First day of instruction	Thursday	January	23	
Last day to drop	Tuesday	February	4	
Last day to add	Tuesday	February	11	
Daylight saving time	Sunday	March	8	
Spring Break	Mon-Fri	March-April	30 - 3	Recess
Last day of instruction	Monday	May	11	Thursday, May 7 th for our classes
Final Examinations	Wed-Fri, Mon-Tue	May	13-15, 18-19	Please look at the bottom of the syllabi at page 5 for the final exam info of this course
Grades due from faculty	Friday	May	22	End of semester

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

Course Info

Catalog Description

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

Prerequisites

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

There is no required text for this course. My lecture notes contain all required materials and homework.

Further Readings

1. Peter Linz, "An Introduction to Formal Languages and Automata," 5th edition, Jones & Bartlett Learning, ISBN-13: 978-1449615529
2. The references at the end of each lecture note.

Course Learning Outcomes (CLO)

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

1. Understand the high-level building blocks of computer science.
2. Analyze and design deterministic and non-deterministic machines for various formal languages.
3. Describe regular languages in terms of regular expressions and vice versa.
4. Analyze and design pushdown automata for some formal languages.
5. Analyze and design Turing machines for some formal languages.
6. Describe the properties of various automata and formal languages.
7. Construct different type of grammars (regular, context-free, etc.) for some formal languages.
8. Use the pumping lemma to prove that some formal languages are not regular.
9. Describe decidability and classify problems as decidable or undecidable.
10. Describe computability and complexity of problems.
11. Categorize languages based on their complexities.
12. Be familiar with some open-questions in computer science.

Examinations, Assignments, Term Project

- Every week, there would be a short quiz and there would also be two midterms, and a final exam.
- There would be a term project and several individual assignments.
- All examinations would cover from the beginning of the semester.
- All examinations would be closed-all-materials.

Grading Information

Assignments	10%
Term Project	15%
10 Quizzes	30%
Midterm #1	10%
Midterm #2	15%
Final	20%
Total	100%

Nominal Grading Scale

From	To	Grade
97	100	A plus
93	96.99	A
90	92.99	A minus
87	89.99	B plus
83	86.99	B
80	82.99	B minus
77	79.99	C plus
73	76.99	C
70	72.99	C minus
67	69.99	D plus
63	66.99	D
60	62.99	D minus
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-hour afterward.

Final Grade

- Your final grade might 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 at the end of the semester are not normal, then I might curve the grades. So, it is not the case that I'd curve all exams and assignments individually.
- More details about final exam can be found in [University policy S17-1](http://www.sjsu.edu/senate/docs/S17-1.pdf) available at <http://www.sjsu.edu/senate/docs/S17-1.pdf>.

Course Requirements and Workload

- There won't be any high-level programming.
- 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>.

Course Format

This will be a traditional lecture type format course. Therefore, students won't need a laptop during the lectures unless for taking notes.

Classroom Protocol

- Be on time! Coming late is disruptive for the other students and the instructor.
- My classes are always interactive. So, participate in the class' activities as much as you can.
- Ask good questions and answer the others' questions (in class and/or in the Canvas discussion) and get extra credit!
- 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 classes.
- Attendance is highly recommended, but is not mandatory, except for exam dates.
 - NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) available 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](http://www.sjsu.edu/senate/docs/S16-9.pdf) available at <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 [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo) available at <http://www.sjsu.edu/gup/syllabusinfo>, which is hosted by the Office of Undergraduate Education. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

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

Day#	Date	Lec#	Topics	Exams
1	01/23	1	Greensheet; A big picture of the course; Who is your professor?	
2	01/28	2	Mathematical preliminaries (part 1); Breaking the ices!	
3	01/30	3	Mathematical preliminaries (part 2);	
4	02/04	4	Formal Languages (part 1);	
5	02/06	5	Formal Languages (part 2);	Quiz 1
6	02/11	6	Deterministic finite automata (part 1); Finalizing enrollments;	
7	02/13	7	Deterministic finite automata (part 2);	Quiz 2
8	02/18	8	Deterministic finite automata (part 3); Preparing development environment	
9	02/20	9	Nondeterministic finite automata (part 1);	Quiz 3
10	02/25	10	Nondeterministic finite automata (part 2); Study guide for midterm 1;	
11	02/27		Midterm 1	Midterm 1
12	03/03	11	Nondeterministic finite automata (part 3); Midterm 1 solution;	
13	03/05	12	Regular languages (part 1);	Quiz 4
14	03/10	13	Pushdown automata (part 1);	
15	03/12	14	Pushdown automata (part 2);	Quiz 5
16	03/17	15	Turing machines (part 1); Team Formation	
17	03/19	16	Turing machines (part 2); Term project assignment	Quiz 6
18	03/24	17	Other Models of Turing machines (part 1)	
19	03/26	18	Other Models of Turing machines (part 2)	Quiz 7
20	03/31		Spring Break	
21	04/02		Spring Break	
22	04/07	19	Regular expressions (part 1); Study guide for midterm 2;	
23	04/09		Midterm 2	Midterm 2
24	04/14	20	Regular expressions (part 2); Grammars (part 1); Midterm 2 solution;	
25	04/16	21	Grammars (part 2);	Quiz 8
26	04/21	22	Grammars (part 3);	
27	04/23	23	Non-regular languages (part 1);	Quiz 9
28	04/28	24	Non-regular languages (part 2);	
29	04/30	25	Introduction to computability (part 1)	Quiz 10
30	05/05	26	Introduction to computability (part 2); Introduction to complexity (part 1);	
31	05/07	27	Introduction to complexity (part 2); Study guide for final;	

Final exam	Section 02 (TR 3:00pm – 4:15pm)	Section 03 (TR 4:30pm – 5:45pm)
Date and Time	Thursday, May 14 @ 2:45pm	Wednesday, May 13 @ 2:45pm
Venue	DH 450	DH 450