

Greensheet

CS 154: Formal Languages and Computability

Fall 2022, **Section 03**

San José State University

Department of Computer Science

Instructor Info

Instructor	Ahmad Yazdankhah	My name is difficult to pronounce!
Office Location	Online	
Email	ahmad.yazdankhah@sjsu.edu	Please email me via Canvas
Website *		Our official educational web tool is Canvas available at https://sjsu.instructure.com/
Phone		Canvas email is the best way to communicate with me!
Office Hours	TR 18:00 – 19:00	Online, by appointment

* Course materials such as handouts, notes, assignment instructions, etc. can be found on [Canvas Learning Management System course login 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	MW 3:00pm – 4:15pm	MW 4:30pm – 5:45pm	MW 6:00pm – 7:15pm
Classroom	DH 450	DH 450	DH 450
Course Type	In-Person	In-Person	In-Person

General Events of Semester

Description	Day of Week	Month	Day #	Comment
First day of instruction	Fri	August	19	Mon August 22, actual first day
Holiday	Mon	September	5	Labor Day – Campus Closed
Last day to add/drop	Thu	September	15	
Daylight saving time	Sun	November	6	
Holiday	Wed-Thu	November	23-24	Thanksgiving
Last day of instruction	Tue	December	6	
Final Examinations	Thu-Fri, Mon-Wed	December	8 - 9 12 - 14	Please look at the syllabi at page 5 for the final exam info
Grades due from faculty	Mon	December	19	End of semester
Grades Viewable on MySJSU	Tue	December	20	

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 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 Detail Info

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 and Evaluations

- Every week, there would be a short quiz.
- There would 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.
- There won't be any makeup for the exams.

Grading Information

Assignments	10%
Term 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 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 is 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

- A computer with microphone and camera is required for the online activities (some lectures, office hours, online exams, etc.).
- 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), available at <http://www.sjsu.edu/senate/docs/S16-9.pdf>.

Course Format

This course will be taught in **in-person** format. **The lectures will be recorded and provided before the lecture time** and students should watch it before attending the class. In each lecture meeting, the lecture will be summarized, last week assignment and quiz will be solved, and students' questions will be responded.

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.
- **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 unless it's being used for taking notes.**
- **Instant messaging, e-mailing, texting, tweeting, etc. are STRICTLY forbidden in my class.**
- **Attendance** is highly recommended, but is not mandatory, except for exam times.

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24) 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) 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	08/22	0	Greensheet; A big picture of the course;	
2	08/24	1	Mathematical preliminaries (part 1);	
3	08/29	2	Mathematical preliminaries (part 2);	
4	08/31	3	Formal Languages	Quiz 1
5	09/05		Holiday: Labor Day	
6	09/07	4	Deterministic finite automata (part 1);	Quiz 2
7	09/12	5	Deterministic finite automata (part 2);	
8	09/14	6	Deterministic finite automata (part 3);	Quiz 3
9	09/19	7	Nondeterministic finite automata (part 1);	
10	09/21	8	Nondeterministic finite automata (part 2);	Quiz 4
11	09/26		Review, Study Guide, Q & A	
12	09/28		Esam: Mid 1	Quiz +
13	10/03	9	Regular languages	
14	10/05	10	Pushdown automata (part 1);	Quiz 5
15	10/10	11	Pushdown automata (part 2);	
16	10/12	12	Turing machines (part 1);	Quiz 6
17	10/17	13	Turing machines (part 2); Term project assignment	
18	10/19	14	Other Models of Turing machines	Quiz 7
19	10/24	15	Regular expressions (part 1);	
20	10/26	16	Regular expressions (part 2);	Quiz 8
21	10/31		Review, Study Guide, Q & A	
22	11/02		Esam: Mid 2	Quiz ++
23	11/07	17	Grammars (part 1);	
24	11/09	18	Grammars (part 2);	Quiz 9
25	11/14	19	Grammars (part 3);	
26	11/16	20	Non-regular languages (part 1);	Quiz 10
27	11/21	21	Non-regular languages (part 2);	
28	11/23		Holiday: Thanksgiving Day	
29	11/28	22	Introduction to computability; Term project due date;	
30	11/30	23	Introduction to complexity (part 1);	
31	12/05		Review, Study Guide, Q & A	

Final exam	Sec 01 (MW 3:00pm – 4:15pm)	Sec 02 (MW 4:30pm – 5:45pm)	Sec 03 (MW 6:00pm – 7:15pm)
Date and Time	Thu, Dec 8 @ 12:15 pm	Wed, Dec 14 @ 2:45pm	Mon, Dec 12 @ 5:15pm
Venue	Online	Online	Online