Greensheet

CS 154: Formal Languages and Computability
Spring 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 213	
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!

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	MH 233	MH 233	SCI 311
Course Number	27352	27353	30436

General Events of Semester

Description	**Day**	**Month**	**Day #**	**Comment**
First day of instruction	Wednesday	January	24	
Last day to drop	Monday	February	5	
Last day to add	Monday	February	12	
Daylight saving time	Sunday	March	11	
Spring Break	Mon-Fri	March	26-30	Recess
Last day of instruction	Monday	May	14	May 10th for TR classes
Final Examinations	Wed-Fri, Mon-Tue	May	16-18, 21-22	Look at the syllabus (page 5) for detail
Grades due from faculty	Friday	May	25	End of semester
Grades Viewable	Monday	June	11	On unofficial transcripts

For academic events of this semester, please refer to the course syllabus at the 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 use online form available at https://goo.gl/forms/ZMRnfxsK6llvxZoi2 to request a permission code for this course. 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.

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. Construct deterministic and non-deterministic machines for various formal languages
2. Describe a regular language in terms of regular expression and vice versa
3. Construct a regular expression for a formal language described by a finite automaton and vice versa
4. Construct a grammar for a formal language

5. Construct a pushdown automaton for a formal language
6. Construct and use context-free grammars
7. Construct and use Turing machines
8. Turn non-deterministic finite automata into deterministic ones
9. Use the pumping lemma technique to show that some formal languages are not regular or not context-free
10. Describe the properties of various automata and formal languages
11. Describe decidability and classify basic problems as decidable or undecidable
12. 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	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 assignment's total score and an additional 20% for each 24 hours after the due date.

Final Grade

- Your final grade can be adjusted depending upon your level and quality of participation in the class activities.
- If the FINAL grades of class are not normal, then I might curve the grades.

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 quizzes, midterms, and final exam
  - working on the term project
- SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.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 to 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.
- Wireless laptops should remain closed until I inform you that it is needed for a particular activity.
- Instant messaging, e-mails, 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 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."

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 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	01/25	1	Greensheet; A big picture of the course; Who is your professor?	
2	01/30	2	Mathematical preliminaries (part 1);	
3	02/01	3	Mathematical preliminaries (part 2);	
4	02/06	4	Formal Languages (part 1);	
5	02/08	5	Formal Languages (part 2); **Finalizing enrollments;**	Quiz 1
6	02/13	6	Deterministic finite automata (part 1);	
7	02/15	7	Deterministic finite automata (part 2);	Quiz 2
8	02/20	8	Deterministic finite automata (part 3); **Preparing development environment**	
9	02/22	9	Nondeterministic finite automata (part 1);	Quiz 3
10	02/27	10	Nondeterministic finite automata (part 2);	
11	03/01		Midterm 1	Midterm 1
12	03/06	11	Midterm 1 solution; Regular languages (part 1);	
13	03/08	12	Regular languages (part 2);	Quiz 4
14	03/13	13	Pushdown automata (part 1);	
15	03/15	14	Pushdown automata (part 2);	Quiz 5
16	03/20	15	Turing machines (part 1);	
17	03/22	16	Turing machines (part 2); **Term project assignment**	Quiz 6
18	03/27		Spring Break	
19	03/29		Spring Break	
20	04/03	17	Other Models of Turing machines	
21	04/05	18	Regular expressions (part 1);	Quiz 7
22	04/10	19	Regular expressions (part 2);	
23	04/12		Midterm 2	Midterm 2
24	04/17	20	Midterm 2 solution; Grammars (part 1);	
25	04/19	21	Grammars (part 2);	Quiz 8
26	04/24	22	Grammars (part 3);	
27	04/26	23	Non-regular languages (part 1);	Quiz 9
28	05/01	24	Non-regular languages (part 2);	
29	05/03	25	Introduction to computability; **Term project due date;**	Quiz 10
30	05/08	26	Introduction to complexity (part 1);	
31	05/10	27	Introduction to complexity (part 2);	

Final exam	**Section 01 (TR 4:30pm – 5:45pm)**	**Section 02 (TR 6:00pm – 7:15pm)**
Date and Time	Thursday, May 17 @ 2:45pm – 5:00pm	Thursday, May 17 @ 5:15pm – 7:30pm
Venue	MH 233	MH 233

Final exam	**Section 03 (TR 3:00pm – 4:15pm)**
Date and Time	Tuesday, May 22 @ 2:45pm – 5:00pm
Venue	SCI 311