

CS 286: Advanced Topics in Computer Science, Fall 2022

Instructor Information

- Name: Faranak Abri
- Office: TBD
- Office Hours: Thursdays 1:00 PM– 4:00 PM (appointments, in-person/zoom)
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Course Objectives

This is the first course in natural language processing (NLP), and after finishing it, students can proceed on to more advanced materials. In this course, we will review the fundamentals of Machine Learning (ML), such as Regression vs. classification, preprocessing, ML models, overfitting, underfitting, and evaluation. Besides, we will learn the fundamentals of natural language processing, such as part-of-speech, lemmatization, stemming, named entity recognition, stop words, dependency parsing, word and sentence similarity, tokenization, preprocessing function, word cloud, text summarization, keyword search, bag of words, TF-IDF (Term Frequency - Inverse Document Frequency), and cosine similarity. Furthermore, we will apply our knowledge of machine learning and natural language processing (NLP) to implement some popular projects in this field using ML models, NLTK, spaCy, and other Python libraries.

Important Dates

- August 22, the first class
- September 5, Labor Day
- November 23, Non-Instructional Day
- December 5, the last class

Prerequisites by Topic

- Knowledge of Machine Learning
- Python programming skills
- Familiar with/Self learn LaTeX

Textbook

Different resources are used for this course. Resources used for each lecture and additional ones will be shared during the lectures

Course Learning Outcomes

Upon completion of this course, students will be familiar with:

- Fundamentals of Machine learning, including Regression vs. classification, preprocessing, ML models, overfitting, underfitting, evaluation
- Fundamentals of Natural Language Processing including part-of-speech, lemmatization, stemming, named entity recognition, stop words, dependency parsing, word, and sentence similarity and tokenization, preprocessing function, word cloud, text summarization, keyword search, bag of words, TF-IDF (Term Frequency - Inverse Document Frequency), and cosine similarity
- Implementing simple NLP projects python libraries and toolkits such as Scikit-Learn, spaCy, NLTK, etc.

Assessment Methods of Learning:

- Three exams 40% = First exam 10% + Second exam 10%, + Final exam 20%
- Three Projects 60% (Each project includes one or more subprojects, written reports and upon the request presentations) = First project 15% + Second Project 15% + Final project 25%

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Grading Policy

- Extra credit questions may be included in assignments and exams, and late submissions received within 24 hours will be deducted 10% of the final grade. Submissions received more than 24 hours late will have a 20% grade removed. Late submissions of more than two days will not be accepted.

Total Grade	Letter Grade	Total Grade	Letter Grade	Total Grade	Letter Grade
95-100	A+	92-94	A	90-91	A-
85-89	B+	82-84	B	80-81	B-
75-79	C+	72-74	C	70-71	C-
65-69	D+	62-64	D	60-61	D-
59 and below	F				

Audio/Video Recording

All audio and video recordings made during lectures, as well as sharing the content created by the instructor, are strictly prohibited. Exceptional cases must be discussed with the instructor in order to obtain approval and consent.

Academic Integrity

- 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 ensure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading." However, attendance will be required in order to complete and submit many in-class exercises, quizzes, and exams.
- It is the aim of the faculty of SJSU to foster a spirit of complete honesty and a high standard of integrity. The University Academic Integrity Policy S07-2 at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic coursework. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The attempt of students to present as their own any work that they have not honestly performed will be considered a violation. During quizzes and exams, communication with other individuals via any means is strictly prohibited without the express permission of the instructor. Violations will be met with the full impact of SJSU's academic integrity policy and procedures.

Civility in the Classroom

- Students are expected to assist in maintaining a classroom environment that is conducive to learning. Inappropriate behavior in the classroom that leads to the distraction of others shall not be tolerated under any circumstances.
- Instruction will begin at or within several minutes of the official published start time for the course. Please make sure that cell phones, beepers, and texting devices are turned off during the entire scheduled class time. Excessive audible discussions with fellow students are prohibited so that others are not disturbed. If any subject matter is not understood, please do not hesitate to ask for clarification. If an extended response is necessary to remove doubts, then a request to follow up outside of scheduled classroom instruction time might be made.

Computational Resources

Students must ensure they have access to sufficient computational resources (e.g., computers and software) to implement projects in the course. An attempt to offer the course in a classroom with

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enough computation resources will be made by the department to support classroom instruction and demonstrations. However, students should be prepared to bring their portable laptops to class.

Religious Holy Day

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence.

Students with Disabilities

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until proper confirmation from Student Disability Services has been provided. [Presidential Directive 97-03](https://sjsu.edu/president/docs/PD_1997-03.pdf) at https://sjsu.edu/president/docs/PD_1997-03.pdf requires that students with disabilities requesting accommodations register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.