**San José State University**

# Department of Computer ScienceCS 286-02, Advanced Topics in Computer Science, Fall 2022

## Course and Contact Information

Instructor(s): Faranak Abri

Office Location: DH 239

Telephone: 4089244844

Email: faranak.abri@sjsu.edu

Office Hours: MW 8AM-9AM

(By appointments, Zoom: [https://sjsu.zoom.us/j/87278487790?pwd=MHNoRzVySzVkK2REK0dpSVQyMlNvdz09](https://www.google.com/url?q=https://sjsu.zoom.us/j/87278487790?pwd%3DMHNoRzVySzVkK2REK0dpSVQyMlNvdz09&sa=D&source=calendar&ust=1662267129696844&usg=AOvVaw2z3OHNC5C3sXuypJgbU1aj))

Class Days/Time: MW 9AM-10:15PM

Classroom: MacQuarrie Hall 422

**Prerequisites:**

Knowledge of machine learning, Python programming skills, Familiarity with/self learn LaTex

## Course Description

*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.*

## Course Format

## The course is delivered in person. Students are asked to join a zoom meeting at the start of class. The zoom will be recorded and used only for the instructor's purposes. (For example, polls and attendance tracking) and not for student use.

### Canvas

It is the student’s responsibility to check canvas regularly. For help with using Canvas see [Canvas Student Resources page (Links to an external site.)](http://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources).

## Course Learning Outcomes (CLO)

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

1. *Fundamentals of Machine learning, including Regression vs. classification, preprocessing, ML models, overfitting, underfitting, evaluation*
2. *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*

## Textbook

*Different resources are used for this course. Resources used for each lecture and additional ones will*

*be shared during the lectures*

### Technology

* Students are required to have an electronic device (laptop or tablet) with a camera and built-in microphone and bring it to the class.
* If you do not have access to an electronic device, SJSU has a free equipment loan program available for students ([link](https://sjsuequipment.getconnect2.com/)).

## Course Requirements and Assignments

* *Two exams 30% = First exam 10% + Second exam 20%,*
* *Three Projects 70% (Each project includes one or more subprojects, written reports and upon the request presentations) = First project 15% + Second Project 20% + Capstone project 35%*
* *Bonus points = Presenting research work for specific topics*

“Per [University Policy S16-9,](http://www.sjsu.edu/senate/docs/S16-9.pdf) success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

### Final Examination or Evaluation

This is a project based course, and the final examination is done by the capstone project and the written report and the presentation (35%)

## Grading Information

*Extra credit questions may be included in assignments and exams. For late submissions, grade deduction will be considered.*

|  |  |  |
| --- | --- | --- |
| *Grade*  | *Points* | *Percentage* |
| *A plus* | *960 to 1000* | *96 to 100%* |
| *A* | *930 to 959* | *93 to 95%* |
| *A minus* | *900 to 929* | *90 to 92%* |
| *B plus* | *860 to 899* | *86 to 89 %* |
| *B* | *830 to 859* | *83 to 85%* |
| *B minus* | *800 to 829* | *80 to 82%* |
| *C plus* | *760 to 799* | *76 to 79%* |
| *C* | *730 to 759* | *73 to 75%* |
| *C minus* | *700 to 729* | *70 to 72%* |
| *D plus* | *660 to 699* | *66 to 69%* |
| *D* | *630 to 659* | *63 to 65%* |
| *D minus* | *600 to 629* | *60 to 62%* |

“This course must be passed with a C- or better as a CSU graduation requirement.”

## Classroom Protocol

* *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.*
* *Per*[*University Policy S12-7 (Links to an external site.)*](https://www.sjsu.edu/senate/docs/S12-7.pdf)*, course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without permission. Students may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent. This includes unauthorized recording or posting of recordings of lectures. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. These policies are designed to protect student privacy and ensure academic integrity.*
* *If a student is caught cheating on a homework assignment, the student will receive a 0 on that assignment. If a student is caught cheating on an exam, the student will receive a 0. A second incident of cheating will result in the student receiving an F in the course. The instructor must report any incidents of cheating or plagiarism to the University per*[*University Policy F15-7 (Links to an external site.)*](https://www.sjsu.edu/senate/docs/F15-7.pdf)*.*

## University Policies

* Per [University Policy S16-9](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](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (https://www.sjsu.edu/curriculum/courses/syllabus-info.php). Make sure to visit this page to review and be aware of these university policies and resources.
* 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.

## Additional Information

* **Religious Holy Day:** A student who intends to observe a religious holyday 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 at https://sjsu.edu/president/docs/PD\_1997-03.pdf requires that students with disabilities requesting accommodations register with the Accessible Education Center (AEC) at <http://www.sjsu.edu/aec>to establish a record of their disability.
* **Basic Needs**: It is hard to succeed in any course if your basic needs are not met. SJSU has resources to assist with food or housing insecurity, emergency financial loans, and other assistance at SJSU Cares. A list of SJSU resources for student success (tutoring and other educational support), basic needs, mental health resources, COVID-19 relief resources, affinity groups on campus, and other helpful resources can be found here ([link )](https://docs.google.com/document/d/1eEPM-aAvYZFnX85OKOTI-s73TZlwolOSDFS_9CFof0U/edit?usp=sharing). [This](https://docs.google.com/document/d/1cM8akFKZ2VyRciczZ374VSNnzXfyr0tLV8bQp5ah5_Q/edit) list is adapted from a list created by Dr. Wilkinson in the biology department. These resources are available in order to help you succeed and make sure your basic needs are met. Please do not hesitate to make use of any available resources. If you have any questions or additions to this list, please reach out to the instructor.

# CS 46B-01 / Introduction to Data Structures, Fall 2022, Course Schedule

There might be some changes to course schedule due to the class circumstances.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week/session** | **Date** | **Topics, Readings, Assignments, Deadlines**  | **Week/session** | **Date** | **Topics, Readings, Assignments, Deadlines** |
| w1/s1 | 8/22 | Introduction | w1/s2 | 8/24 | Introduction |
| w2/s3 | 8/29 | preprocessing  | w2/s4 | 8/31 | regression, models, evaluation |
| w3/s5 | 9/5 | Labor Day | w3/s6 | 9/7 | overfitting, underfitting |
| w4/s7 | 9/12 | classification, models, evaluation  | w4/s8 | 9/14 | classification, models, evaluation  |
| w5/s9 | 9/19 | review | w5/s10 | 9/21 | First exam |
| w6/s11 | 9/26 | part-of speech, stop words, | w6/s12 | 9/28 | lemmatization, stemming |
| w7/s13 | 10/3 | tokenization, preprocessing function | w7/s14 | 10/5 | tokenization, preprocessing function |
| w8/s15 | 10/10 | bag of words, TF-IDF (Term Frequency - Inverse Document Frequency) | w8/s16 | 10/12 | bag of words, TF-IDF (Term Frequency - Inverse Document Frequency) |
| w9/s17 | 10/17 | word and sentence similarity and cosine similarity | w9/s18 | 10/19 | word and sentence similarity and cosine similarity |
| w10/s19 | 10/24 | dependency parsing | w10/s20 | 10/26 | dependency parsing |
| w11/s21 | 10/31 | named entity recognition | w11/s22 | 11/2 | named entity recognition |
| w12/s23 | 11/7 | text summarization | w12/s24 | 11/9 | text summarization |
| w13/s25 | 11/14 | keyword search | w13/s26 | 11/16 | review |
| w14/s27 | 11/21 | Second exam  | w14/s28 | 11/23 | Non-Instructional Day  |
| w15/s29 | 11/28 | Capstone project presentation | w15/s30 | 11/30 | Capstone project presentation |
| w16/31 | 12/5 | Capstone project presentation | Final Exam | 12/137:15 a.m.-9:30 a.m | <https://www.sjsu.edu/classes/final-exam-schedule/fall-2022.php>No final exam. |