San José State University
Department of Computer Science
CS271, Topics in Machine Learning, Section 2, Fall, 2023

Course and Contact Information

Instructor:	Fabio Di Troia
Office Location:	MH 217
Telephone:	
Email:	fabio.ditroia@sjsu.edu
Office Hours:	TT, 13:00 – 14:00
Class Days/Time:	TT 15.00 – 16:15
Classroom:	MH 225 (Sweeney Hall)
Prerequisites:	CS 157A. Graduate standing. Allowed Declared Major: MS in Computer Science, Bioinformatics, Data Science. Or instructor consent.

Course Format

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Leaning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

Course Description

Variable topics in machine learning. Content may include hidden Markov models, principal component analysis, support vector machines, clustering, boosting, random forests, neural networks, and deep learning. Relevant applications will be covered.

Course Learning Outcomes (CLO)

After completing this course students should have a working knowledge of a wide variety of machine learning topics and have a good understanding of how to apply such techniques to real-world problems.

Required Texts/Readings

Textbook

Machine Learning with Applications in Information Security, by Mark Stamp, published by Chapman Hall/CRC in 2017.
ISBN-10 : 1138626783
ISBN-13 : 978-1138626782

Other Readings

None

Other technology requirements / equipment / material

None

Course Requirements and Assignments

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.

Homework, Midterm and Final exam are expected for this class. Homework is due on Canvas by class starting time on the due date. Each assigned problem requires a solution and an explanation (or work) detailing how you arrived at your solution. Cite any outside sources used to solve a problem. When grading an assignment, I may ask for additional information.

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."

CoS COVID-19 Safety

All students registered for a College of Science (CoS) class with an in-person component must view the CoS COVID-19 Training slides and the SJSU Phased Adapt Plan website and acknowledge reading them according to their instructor's directions. By working together to follow these county and SJSU safety practices, we can keep our college safer. Students who do not follow COVID-19 Safety practice(s) outlined in the training, the SJSU Phased Adapt Plan, or instructions from their instructors, TAs or CoS Safety Staff may be dismissed from CoS buildings, facilities or field sites. Please review this training as needed throughout the semester, as updates will be implemented as changes occur (and posted to the same links).

Recording Zoom Classes

This course or portions of this course (i.e., lectures, discussions, student presentations) will be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording). Students are not allowed to record without instructor permission. Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

Students are required to have an electronic device (laptop, desktop or tablet) with a camera and built-in microphone. SJSU has a free equipment loan program available for students.
Students are responsible for ensuring that they have access to reliable Wi-Fi during tests. If students are unable to have reliable Wi-Fi, they must inform the instructor, as soon as possible or at the latest one week before the test date to determine an alternative. See Learn Anywhere website for current Wi-Fi options on campus.

Final Examination or Evaluation

The final test will be published on Canvas and will be submitted online.

Grading Information

- Homework, 25%
- Midterm 1, 25%
- Midterm 2, 25%
- Final Project, 25%

Note that "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See University Policy F13-1 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Determination of Grades

Semester grade will be computed as a weighted average of the scores obtained in each of the three categories listed above.
No make-up tests or quizzes will be given, and no late homework (or other work) will be accepted. Also, in-class work must be completed in the section that you are enrolled in.

Nominal Grading Scale:

Percentage	Grade
92 and above	A
90 – 91	A-
88 – 89	B+
82 – 87	B
80 – 81	B-
78 – 79	C+
72 – 77	C
70 – 71	C-
68 – 69	D+
62 – 67	D
60 - 61	D-
59 and below	F

Classroom Protocol

- Cheating is strictly prohibited.
- Students must show respect towards the instructor and their peers. This means no disruptive or annoying talking during class.
- Please remember to turn off cell phones during class.
- Ensure punctuality, as class starts on time.
- Always have a valid picture ID with you while in the classroom.

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/". Make sure to review these policies and resources.

CS271 / Topics in Machine Learning, Fall 2023, Course Schedule

The schedule is subject to change with fair notice communicated via Canvas course page

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	08/22	Introduction to the course
1	08/24	Artificial Neural Networks
2	08/29	Artificial Neural Networks
2	08/31	Artificial Neural Networks
3	09/05	Deep Learning
3	09/07	Deep Learning
4	09/12	Deep Learning
4	09/14	Deep Learning
5	09/19	Convolutional Neural Networks
5	09/21	Recap.
6	09/26	**Midterm 1 week**
6	09/28	**Midterm 1 week**
7	10/03	Support Vector Machines
7	10/05	Support Vector Machines
8	10/10	NLP: Classic vs Machine Learning
8	10/12	NLP: Recurrent Neural Networks
9	10/17	NLP: Long Short-Term Memory
9	10/19	NLP: Transformers
10	10/24	ROC Curves, AUC, and additional metrics
10	10/26	Ensemble Learning
11	10/31	**Midterm 2 week**
11	11/02	**Midterm 2 week**
12	11/07	k-Nearest Neighbor and Random Forest
12	11/09	k-Nearest Neighbor and Random Forest
13	11/14	Oversampling and Undersampling techniques
13	11/16	Oversampling and Undersampling techniques
14	11/21	TBD
14	11/23	--THANKSGIVING--

Week	Date	Topics, Readings, Assignments, Deadlines
15	11/28	Reinforcement Learning
15	11/30	Clustering
16	12/05	Recap
Final Exam	12/11	2:45-5:00 PM