SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Machine Learning

CS 171

Fall 2025 Section 02 Hybrid 3 Unit(s) 08/20/2025 to 12/08/2025 Modified 06/23/2025

Contact Information

My name is Mike Wood and I look forward to working with you as we learn about fundamental topics in Machine Learning!

Instructor: Dr. Mike Wood

Email: mike.wood@sjsu.edu

I welcome you to contact me outside of class either by email or by joining me in office hours. If your schedule prevents you from joining my scheduled office hours, please get in touch and I will be happy to schedule a time slot to meet with you.

Office Hours

Tuesday, 1:00 PM to 2:00 PM, Virtual

Virtual office hours can be accessed via the Zoom link on Canvas

Course Description and Requisites

Covers a selection of classic machine learning techniques including backpropagation and several currently popular neural networking and deep learning architectures. Hands-on lab exercises are a significant part of the course. A major project is required.

Prerequisite(s): CS 146 (with a grade of "C-" or better). Computer Science or Software Engineering majors only.

Letter Graded

Classroom Protocols

Classroom Learning Environment:

This course will follow a hands-on learning approach where we will work through coding exercises together in class. Please come to class with a charged laptop ready to dive into some code!

Code of conduct:
Short version: In this course, I aim to foster a positive learning environment - no form of harassment will be tolerated, including verbal comments and images that exclude people based on gender, socio-economic status, or appearance.

The full code of conduct is provided on the Canvas course space for this course.

Plagiarism and cheating

Just like a written essay, using somebody's computer code - whether from a classmate, a site like Stack Overflow, or a Large Language Model - without proper acknowledgement is considered plagiarism. Homework problems should be based entirely on students' own work. Students can (and are encouraged to) discuss general coding techniques and problem solving strategies for homework problems but this should never include copying (whether by typing, file transfer or cutting and pasting), looking at somebody else's code on their computer to get help, or allowing copying to occur. Students found violating this policy once will receive zero credit for those problems. Continued violations will result in disciplinary action. If you have any questions about this policy, please don't hesitate to ask for clarification.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

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

1. Define and explain fundamental concepts in machine learning including supervised and unsupervised learning; common algorithms and their applications in different problems; and model evaluation techniques.
2. Implement and apply machine learning algorithms including simple routines from scratch and more complex models in tools such as scikit-learn and PyTorch.
3. Evaluation the performance of machine learning models using appropriate metrics and discuss model limitations.

Course Materials

This course will utilize The Quick Python Book by Naomi Cedar (3rd Edition, ISBN 9781617294037).

Machine Learning with PyTorch and Scikit-Learn

Author: Sebastian Raschka, Yuxi (Hayden) Liu, Vahid Mirjalili
ISBN: 978-1801816380
Optional

The Machine Learning with PyTorch and Scikit-Learn is available at the MLK Library, including electronic options accessible through the Library Course Materials tab on Canvas.

✔ Grading Information

Category	Percent of Total Grade
Problem of the Week	15
Homework	30
Midterm	20
Project	35

University Policies

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

Course Schedule

This course will meet twice per week during the Spring semester as follows:

- Tuesdays, virtually on Zoom, 3:00-4:15 pm
- Thursdays, in-person in 422 MacQuarrie Hall, 3:00-4:15 pm

Week	Day	Date	Lecture	PotW	Homework
1	Thurs	8/21	Introduction	PotW 1 Due 8/24	
2	Tues	8/26	Regression and Loss Functions		

2	Thurs	8/28	Gradient Descent	PotW 2 Due 8/31	
3	Tues	9/2	Multilinear Regression		HW 1 Due 9/3
3	Thurs	9/4	Classifiers: Perceptron	PotW 3 Due 9/7	
4	Tues	9/9	Classifiers: Logistic Regression		
4	Thurs	9/11	Classifiers: Decision Trees	PotW 4 Due 9/14	
5	Tues	9/16	Bias and Variance		HW 2 Due 9/17
5	Thurs	9/18	Ensemble Learning	PotW 5 Due 9/21	
6	Tues	9/23	Intro to Neural Networks		
6	Thurs	9/25	2-layer NNs	PotW 6 Due 9/28	
7	Tues	9/30	Backpropagation		HW 3 Due 10/1
7	Thurs	10/2	PyTorch	PotW 7 Due 10/5	
8	Tues	10/7	CNNs Part 1		
8	Thurs	10/9	CNNs Part 2	PotW 8 Due 10/12	
9	Tues	10/14	Github Final Project Formulation		
9	Thurs	10/16	Midterm	PotW 9 Due 10/19	
10	Tues	10/21	RNNs Part 1		HW 4 Due 10/22
10	Thurs	10/23	RNNs Part 2	PotW 10 Due 10/26	
11	Tues	10/28	Transformers		
11	Thurs	10/30	LLMs	PotW 11 Due 11/2	
12	Tues	11/4	PCA		HW 5 Due 11/5
12	Thurs	11/6	PCoA, MDS	PotW 12 Due 11/9	
13	Tues	11/11	Clustering Analysis		
13	Thurs	11/13	GANs	PotW 13 Due 11/16	
14	Tues	11/18	Self Organizing Maps		HW 6 Due 11/19

14	Thurs	11/20	Final Project Meetings	PotW 14 Due 11/23	
15	Tues	11/25	Reinforcement Learning		
15	Thurs	11/27	Thanksgiving	PotW 15 Due 11/30	
16	Tues	12/2	Final Project Presentations		
16	Thurs	12/4	Final Project Presentations		
		12/11	**Final Projects**		Final Projects Due 12/11 at 1:00 pm

Course schedule subject to change. Students are encourage to follow updates and announcements on Canvas throughout the course.