

# Topics in Machine Learning

## CS 271

Fall 2025 Section 02 In Person 3 Unit(s) 08/20/2025 to 12/08/2025 Modified 08/21/2025

### Contact Information

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Instructor: Mira Jane

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Office Hours

Tuesday, Thursday, 3:00 PM to 4:00 PM, DH282

### Course Information

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Lectures

Tuesday, Thursday, 1:30 PM to 2:45 PM, MH 225

In-person.

### Course Description and Requisites

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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.

Prerequisite(s): CS 157A. Allowed Declared Major: MS in Computer Science, Bioinformatics, Data Science. Or instructor consent.

Letter Graded

### Classroom Protocols

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- Regular attendance is an integral part of the learning process.
- Please arrive to class on time and make sure your cell phones are silent during the lecture.

- Class time will be spent in interactive lecture.
- You are required to bring your wireless laptop to class. Your laptop must remain closed except for designated activities.
- We will use in-class short quizzes to allow everyone to participate, gather feedback, and check understanding of the material.

## Program Information

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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)

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The focus of this course will be to strengthen the ML foundations and go deeper after having done an introduction on these topics. The course will also involve hands-on experience with building ML models using various techniques. At the successful completion of the course, the students will be able to:

- Understand basic ML concepts.
- Understand Linear Regression.
- Understand Linear classification.
- Be able to build simple Multi-Layer Perceptron models.
- Understand Backpropagation.
- Understand deepnets training fundamentals.
- Be able to use TensorBoard.
- Understand and build models with CNN.
- Understand and build models with RNN.
- Understand and build Transformer models for applications in Natural-Language Processing.
- Understand and build Reinforcement Learning models.
- Explain AI Ethics and Philosophy concepts.
- Be able to read latest academic research papers in ML.

## Course Materials

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### Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow

**Author:** Aurélien Géron

**Publisher:** O'Reilly

**Edition:** 3rd Edition

**ISBN:** 9781098125967

Optional

[notebooks \(https://github.com/ageron/handson-ml3/blob/main/index.ipynb\)](https://github.com/ageron/handson-ml3/blob/main/index.ipynb).

## ✓ Grading Information

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### Criteria

Grading will be on a **curve** on the weighted sum:

- In-class participation: 5%
- In-class quizzes: 15%
- Take-home assignments: 40%
- In-class mid term: 10%
- Presentation: 10%
- Final Exam: 20%, Tuesday, December 16, 1:00-3:00 PM

**Late** submission for take-home assignments: -20% per day

### Academic Honesty

All work must be yours only, no collaboration allowed, no use of AI/ML tools allowed unless the question specifically asks to use such tools.

## University Policies

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Per [University Policy S16-9 \(PDF\) \(http://www.sjsu.edu/senate/docs/S16-9.pdf\)](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 \(https://www.sjsu.edu/curriculum/courses/syllabus-info.php\)](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.