SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Topics in Machine Learning

CS 271

Fall 2026 Section 02 In Person 3 Unit(s) 08/19/2026 to 12/07/2026 Modified 08/26/2026

Contact Information

Instructor: Dr. Jelena Gligorijevic

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Office: MacQuarrie Hall 211

Office Hours

Tuesday, 12:30 PM to 2:30 PM, MacQuarrie Hall 211

Please schedule your time here: https://calendar.app.google/B34F7MkEbNAPLESg9 (https://calendar.app.google/B34F7MkEbNAPLESg9)

Please check my office-hours calendar before coming, since other students may already be scheduled during that time. I will keep the calendar updated and add additional availability when possible/needed. Booking through the calendar helps ensure you don't wait and that we can use the time efficiently. If you need more time, please book more than one time slot.

Course Information

Lecture

Tuesday, Thursday, 9:00 AM to 10:15 AM, Science Building 311

Course Description and Requisites

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. Graduate standing. Allowed Declared Major: MS in Computer Science, Bioinformatics, Data Science. Or instructor consent.
Grading: Letter Graded

Classroom Protocols

Students are expected to adhere to the Student Conduct Code (https://www.sjsu.edu/studentconduct/).

Communication:
This semester, we'll be using a private Discord server as our main space for class communication and collaboration.

Discord is where we can:

- Ask and answer course-related questions.
- Share ideas, resources, and helpful tips.
- Learn from one another's perspectives and approaches.
- Continue discussions beyond class time.
- Organize and coordinate with your project team.

Instead of sending most questions by email, please post them in the appropriate Discord channel so the whole class can see and benefit from the responses. Your classmates may have the same question, and sometimes, a peer's explanation will click for you even faster.

A direct link to join will be given in Canvas.

Private or sensitive matters should be addressed through direct messages or discussed during office hours.

Office hours are the best time to get help with assignments, conceptual questions, or technical troubleshooting.

Use of AI Tools

Unless an assessment explicitly permits AI-assisted work, assume that AI tools are not permitted. Eachassessed task will state its AI-use mode: individual work, AI-assisted work, or AI review activity.

- Individual work: AI tools are not permitted unless the prompt states otherwise.
- AI-assisted work: AI tools may be used within the stated boundaries. Students remain responsiblefor correctness, attribution, privacy, and verification.
- AI review activity: students evaluate provided or generated AI work and explain how it was checked,corrected, or rejected

For permitted AI use, assignments may ask students to report the tool, the task, a consequential suggestion accepted and verified, and a suggestion rejected or modified. Do not enter private, proprietary, human-subject, or otherwise restricted data into external AI system.

Submitting AI-generated work that you cannot explain, presenting fabricated data/citations/results, or misrepresenting work as independently verified is inconsistent with course expectations and may also violate SJSU academic integrity policy.

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)

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.

Course Requirements and Assignments

This course uses:

- **In-class hands-on activities:** hands-on activities, discussions, or short technical tasks connected to the current unit.
- **Homework assignments:** homework assignments ask students to connect derivation, implementation, testing, experimentation, and diagnosis. Prompts will specify what may be completed independently, collaboratively, or with permitted tool assistance.
- **Review assignments and short quizzes:** Short review work and quizzes help students maintain prerequisite skills, prepare for discussion, and check understanding of central course ideas.
- **Exams:** There will be one midterm and one final exam. The exams are individual assessments. Make-up exams will only be considered for emergencies with proper documentation.
- **Team project:** Students complete an instructor-approved machine-learning project in a small team. The project includes problem formulation, data and evaluation choices, baseline or comparison work, reproducible code, technical communication.

Grading Information

Breakdown

- Project Assignments 30%

- Midterm Exam 20%
- Final Exam 20%
- Homework Assignments 10%
- In class hands-on 10%
- Review assignments and Quizzes 10%

Criteria

Final grades:

Grade	Points
A plus	≥ 97
A	93 - 96.99
A minus	90 - 92.99
B plus	86 - 89.99
B	83 - 85.99
B minus	80 - 82.99
C plus	76 - 79.99
C	73 - 75.99
C minus	70 - 72.99
D plus	66 - 69.99
D	63 - 65.99
D minus	60 - 62.99
F	< 60

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

The course schedule is subject to change with fair notice. Changes will be announced in Canvas.

Class	Date	Topic
1	Thu Aug 20	Course introduction
2	Tue Aug 25	Algebra of prediction
3	Thu Aug 27	Derivatives and learning
4	Tue Sep 1	Linear regression, least squares, Gaussian interpretation
5	Thu Sep 3	Gradient descent, SGD, diagnostics
6	Tue Sep 8	Logistic regression and Bernoulli likelihood
7	Thu Sep 10	Softmax and multiclass classification
8	Tue Sep 15	Loss functions and what they estimate
9	Thu Sep 17	Metrics, thresholds, decision costs
10	Tue Sep 22	Generalization, regularization, model selection
11	Thu Sep 24	Project methodology and scope
12	Tue Sep 29	Experimental design, leakage, reproducibility
13	Thu Oct 1	Trees and ensembles
14	Tue Oct 6	Midterm Prep
15	Thu Oct 8	Midterm Exam
16	Tue Oct 13	Neural networks as compositions
17	Thu Oct 15	Backpropagation
18	Tue Oct 20	From-scratch two-layer MLP
19	Thu Oct 22	PyTorch autograd and diagnostics
20	Tue Oct 27	Learned representations and embeddings
21	Thu Oct 29	Scaled dot-product attention
22	Tue Nov 3	Transformer architecture
23	Thu Nov 5	Transformer paper and implementation
24	Tue Nov 10	Tokenization, pretraining, instruction tuning, prompting
25	Thu Nov 12	Fine-tuning, LoRA, low-rank adaptation

Class	Date	Topic
26	Tue Nov 17	Retrieval and RAG
27	Thu Nov 19	Trustworthy evaluation and documentation.
28	Tue Nov 24	Project discussions and final prep.
-	Thu Nov 26	Thanksgiving holiday, no class
29	Tue Dec 1	Project presentations
30	Thu Dec 3	Project presentations
Final	Thu Dec 10 8:30-10:30 AM	Final Exam