Introduction to Machine Learning

CS 171

Spring 2026   Section 01   In Person   3 Unit(s)   01/22/2026 to 05/11/2026   Modified 01/12/2026

👤 Contact Information

Instructor	Dr. Tahereh Arabghalizi (She, Her)
Office	DH 211
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Office Hours	Tuesday,Thursday 6-7pm ([by appointment (https://calendly.com/tahereh-arabghalizi-sjsu-fall23)](https://calendly.com/tahereh-arabghalizi-sjsu-fall23)) - All questions should be asked during the office hours, unless they are short/simple questions.
Grader	Yug Amol More: [yugamol.more@sjsu.edu (mailto:yugamol.more@sjsu.edu)](mailto:yugamol.more@sjsu.edu)

💻 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

Students are expected to adhere to the Student Conduct Code found at the [SJSU Student Conduct website (http://www.sjsu.edu/studentconduct/)](http://www.sjsu.edu/studentconduct/) (http://www.sjsu.edu/studentconduct/). Additionally, students should regularly attend lectures and labs (if applicable), treat instructors and peers with respect, and refrain from the use of cell phones during any classroom activities.

- Regular class attendance is highly recommended and strongly encouraged.

- Please arrive to class on time so that you benefit fully from the course experience and you do not disturb classmates and the instructor while class is in session.
- Students are responsible for knowing all materials covered in class lectures, readings, assignments, and other course-related work.
- Laptops, tablets, and other devices should only be used for course-related purposes.
- All exams must be taken in-person except for extreme emergencies.

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 Goals

This course is an Introduction to the fundamental principles and practical applications of Machine Learning. You'll gain a good understanding of both supervised and unsupervised learning techniques, exploring algorithms like linear regression, decision trees, SVM, k-means clustering, Neural Networks, and more. Throughout the course, you will learn effective strategies to overcome common challenges in machine learning such as overfitting, imbalanced data, etc. ensuring the robustness and reliability of your models.

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 Materials

Recommended Texts/Readings

- An introduction to statistical learning with applications in Python by Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, Jonathan Taylor
- Pattern Recognition and Machine Learning by Christopher M. Bishop
- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron
- Python Crash Course by Eric Matthes

Other technology requirements / equipment / material

- You may need a laptop with internet access.

Course Requirements and Assignments

- **In class hands-on, pop quizzes/questions and discussion** may be given anytime. The purpose of in class exercises and pop questions is to encourage you to learn, study and review the concepts and materials presented/discussed in the lecture.
- **Programming Assignments**: Programming assignments are to be done individually, unless otherwise specified. They can be discussed but should be implemented individually. More information is given at the time of the first programming assignment. Never use any code you find on the web, unless I provide it. Some assignments may have an oral discussion or examination.
- **Final Project**: Students are required to form teams of two or three members. Additional details will be provided later in the semester. Individual projects are not accepted under any circumstances.
- **Midterm Exam**: A midterm exam will be held approximately midway through the semester; the exact date will be announced in advance.
- **Final Exam**: The final exam could be comprehensive or non-comprehensive ([Date (https://www.sjsu.edu/classes/final-exam-schedule/spring-2026.php)](https://www.sjsu.edu/classes/final-exam-schedule/spring-2026.php)).

Course Policies

Incomplete Work: Points will be deducted for incomplete question responses and solutions that are partially functional. Consult individual assignments for details of point allocation for each problem.

Late Assignments: No late homework will be accepted. However, under exceptional circumstances, one problem set per student might be accepted late. It will need to be handed in before the following class meeting and will be graded with 30% off. Such an extension should be requested from the instructor.

Makeup Exams: Makeup exams will only be given in cases of illness (documented by a doctor) or in cases of documentable, extreme emergencies.

Academic Honesty: Students must only submit their own work for all quizzes, assignments, exams, and projects. Copying and any other form of cheating will not be tolerated and will result in a failing grade (F) for the course, as well as disciplinary consequences from the university.

✔ Grading Information

Grading Information

Course weightings will be as follows:

- 25% Programming Assignments & Hands-on
- 25% Final Project
- 25% Midterm Exam
- 25% Final Exam
- Extra 5% Class Activity including Attendance, Polls & Surveys

Your course grade will be determined by your final weighted average:

- *A plus = 97% or higher*
- *A = 93% up to 97%*

- *A minus = 90% to 93%*
- *B plus = 87% to 90%*
- *B = 83% to 87%*
- *B minus = 80% to 83%*
- *C plus = 77% to 80%*
- *C = 73% to 77%*
- *C minus = 70% to 73%*
- *D plus = 67% to 70%*
- *D = 63% to 67%*
- *D minus = 60% to 63%*
- *F = 0% to 60%*
- Boundary cases count as the higher of the two grades.

 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 S20-2](#) for more details.

🏛 University Policies

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.

📅 Course Schedule

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

Week	Topics
1	Course Introduction, Prerequisites Check
1	Introduction to Machine Learning
2	Decision Trees
2	Decision Trees: Overfitting and Evaluation

Week	Topics
3	Ensemble Methods
3	k-Nearest Neighbors
4	Linear Regression
4	Logistic Regression
5	Data Preprocessing
5	Programming Assignment #1
6	Regularization
6	Support Vector Machines
7	Support Vector Machines
7	Review for Midterm
8	No class (students study for midterm)
8	**Midterm Exam**
9	Navie Bayes Classifiers
9	Programming Assignment #2
10	Spring Break
10	Spring Break
11	Neural Networks

Week	Topics
11	Deep Learning - CNN
12	Deep Learning - NLP
12	Deep Learning - NLP
13	Unsupervised Learning
13	Reinforcement Learning
14	Project Discussions
14	Project Presentations
15	Project Presentations
15	Project Presentations
Final Exam	Check Date and Time Here (https://www.sjsu.edu/classes/final-exam-schedule/spring-2026.php)