# DSC140A | Probabilistic Modeling and Machine Learning

Spring 2026

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**Instructor**
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**Instructional Assistants**
Pengcen Jiang — p5jiang@ucsd.edu
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**Office hours**
Mikio - T 4-5, W 3:30-4:30,
Pengcen - W/F, 10-11 am
Jake - T/Th 9-10am, HDSI 336
Jude - M 4-5 pm

**Class Schedule**
Lectures: M/W/F, 12-12:50pm
Location: SOLIS 107
Discussion: Mondays 3-3:50pm
Location: CTL 0125

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This course is designed to be a rigorous introduction to machine learning and statistical modeling.

**Students will be able to:**

- Understand and be able to apply common machine learning methods to data
- Think critically about model assumptions, model estimation and interpretation of the results.
- Select an appropriate machine learning method to suit a specific problem.

## Prerequisites

You should be comfortable working with probability distributions, multivariable calculus, matrix algebra, and Python. We briefly review these concepts – though the class is structured in a way that allows you to catch up or refresh your memory. Prior exposure to classification, regression, probability distributions, and convex optimization will be helpful but not required.

## Grading

- **Homework (10%): Credit/No Credit.** Assigned weekly. Assignments will be released at least one week prior to their due date.
- **Quizzes (30%): Best 3 out of 4.** Will be taken in-person during discussion sessions with paper and pen/pencil.
- **Midterm (25%):** To be taken in-person on week 6. Will cover material from weeks 1-5.
- **Final (35%):** Will include midterm redo + material from weeks 6-10.

- The final exam will have 2 parts. Part I will cover the same material as the midterm exam. To support your learning and recognize improvement, if you score higher on Final Exam Part I than on the midterm, we will use that score in place of the midterm.

### Notes on Homeworks

Although the correctness of your homeworks will not be evaluated, it is up to you to make sure that you thoroughly understand each problem and how its answer is produced. This goes for both coding and mathematical assignments. Therefore, we will have no policy for whether or not you work with a partner or AI on your homeworks.

- All Homework assignments should be submitted on Gradescope.
- Please submit a single pdf.
    - You can use the overleaf LaTeX template we provide, or you can use markdown in the notebook to type up your math (also using LaTeX). Make sure you clearly mark which problem it is.
    - For coding problems, recommend writing your code in a jupyter notebook and convert it to a pdf, then combine it with the math problems into one pdf.

### Late policy

You will get 2 "slip days" that can be used for any reason, on any Homework assignment. You must notify your TA **before the due date** of each assignment that you wish to use a slip day and you will get 24 additional hours to complete an assignment without penalty. If you do not indicate that you want to use a slip day, or your slip day has expired, then your grade will go down by 10% for every 24 hour late period or portion thereof.

### Notes on Quizzes

Your mastery of the material will be tested in a closed-book setting during quizzes. We will provide you with whatever information you need to solve each problem. Quiz questions will take the form of math problems and/or code snippets that need to be interpreted. Since we cannot provide makeup quizzes, we will use the best 3 quiz grades out of the 4 quizzes (i.e. we will 'drop' your lowest quiz score) to provide some leeway for missing a quiz for any reason.

### Cheatsheets

- For each quiz: you can write/print a single side on an A4 paper and submit them back to us along with your exam paper.
- For midterm exam: you can write/print a double-sided A4 paper.
- For final exam: you can write/print two double-sided A4 papers.

## Course Resources

### Notes and text

The lecture slides will be posted in advance of each lecture. No textbook will be required, but we will be using selected topics and reading from parts of the following textbooks, all of which are available in pdf for free from various online resources:

- The Elements of Statistical Learning (ESL)
- Pattern Recognition and Machine Learning (PRML)
- Probabilistic Machine Learning: An Introduction (PML)

## Links

- Course schedule (Subject to change)
- Campuswire
- Gradescope
- Canvas

### Other class policies

**Environment of inclusivity**
This course is meant to be intellectually challenging and is attended by students with a wide range of skills, levels of preparation, life histories, cultures, and able-ness. It is essential to the functioning of this course that we foster an inclusive environment of mutual respect, in which we all feel we can express confusion, ask questions, and challenge each other constructively. If at any point you feel that you or others are not being provided with the resources you need to be successful in this course then please let me know immediately.

**Course accommodations**
If you need accommodations for this course due to a disability, please contact the *Office for Students with Disabilities* (osd@ucsd.edu) for an Authorization for Accommodation (AFA) letter. Please speak with me in the first week of class if you intend to apply for accommodations. For more information, visit http://disabilities.ucsd.edu.

**Academic Integrity**
You won't benefit if others do your work. If you're unclear about what constitutes cheating in this course, please ask. Cases of academic dishonesty or cheating will be first handled by me, and then by the Academic Integrity Office. If you become aware of cheating in this class, you can anonymously report it: https://academicintegrity.ucsd.edu/.

## Resources for Support and Learning

There are a variety of resources available to students at UC San Diego, which are designed to address needs and enhance the student experience. We encourage you to check it out.

| **Learning and Academic Support** | |
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| Ask a Librarian: Library Support<br>Chat or make an appointment with a librarian to focus on your research needs<br><br>Course Reserves, Connecting from Off-Campus and Research Support<br>Find supplemental course materials<br><br>First Gen Student Success Coaching Program<br>Peer mentor program that provides students with information, resources, and support in meeting their goals<br><br>Office of Academic Support & Instructional Services (OASIS)<br>Intellectual and personal development support | Writing Hub Services in the Teaching + Learning Commons<br>One-on-one online writing tutoring and workshops on key writing topics<br><br>Supplemental Instruction<br>Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses<br><br>Tutoring – Content<br>Drop-in and online tutoring through the academic Achievement Hub<br><br>Tutoring – Learning Strategies<br>Address learning challenges with a metacognitive approach |
| **Support for Well-being and Inclusion** | |
| Basic Needs at UCSD<br>Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live is encouraged to contact: foodpantry@.ucsd.edu \| basicneeds@ucsd.edu \| (858) 246-2632<br><br>Counseling and Psychological Services<br>Confidential counseling and consultations for psychiatric service and mental health programming<br><br>Triton Concern Line<br>Report students of concern: (858) 246-1111<br><br>Office for Students with Disabilities (OSD)<br>Supports students with disabilities and accessibility across campus | Community and Resource Centers Office of Equity, Diversity, and Inclusion<br>As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus (858) 822-3542 \| diversity@ucsd.edu<br><br>Get Involved<br>Student organizations, clubs, service opportunities, and many other ways to connect with others on campus<br><br>Undocumented Student Services<br>Programs and services are designed to help students overcome obstacles that arise from their immigration status and support them through personal and academic excellence |