



# CS 229

## Machine Learning

### Handout #1: Course Information

#### Meeting Times and Locations

Lectures	Mondays and Wednesdays, 9:30 AM - 10:50 AM NVIDIA Auditorium (in the Huang Engineering Center)
Discussion Sections	Fridays, 2:30 – 3:20 PM NVIDIA Auditorium (optional attendance)

#### Teaching Staff

<u>Professor</u> Andrew Ng Office: Gates 156	<u>Course Coordinator</u> Swati Dube Office: Gates 127
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#### Teaching Assistants

Sam Corbett-Davies	Huafei Wang	Youssef Ahres
Irene Kaplow	Nikhil Parthasarthy	Haque Ishfaq
Liuyu Zhou	Peng Hui How	Alexander Martinez
Yang Kai Lin	Junjie Qin	Bryan Annenberg
Albert Haque	Yiming Sun	Saurabh Vyas
Bryan McCann	Celina Xueqian Jiang	Vedant Ahluwalia
Marco Alban	Ivaylo Hachevanov	Ziang Xie

#### Contact Information

Please post your question about homework, technical or general administration for CS229 on our Piazza forum. You can also email us at [cs229-qa@cs.stanford.edu](mailto:cs229-qa@cs.stanford.edu). For telephone numbers and information about office hours (where we can help you in person), please see office hours and contact information.

#### Course Description

CS229 provides a broad introduction to machine learning and statistical pattern recognition. Topics include: supervised learning (generative/discriminative learning, parametric/non-parametric learning, neural networks, support vector machines); unsupervised learning (clustering, dimensionality reduction, kernel methods); learning theory (bias/variance tradeoffs; VC theory; large margins); reinforcement learning and adaptive control. The course will also discuss recent applications of machine learning, such as: robotic control, data mining, autonomous navigation, bioinformatics, speech recognition, text and web data processing.

#### Prerequisites

Students are expected to have the following background:

- Knowledge of basic computer science principles and skills, at a level sufficient to write a reasonably non-trivial computer program.

- Familiarity with the basic probability theory. (CS 109 or STATS 116 is sufficient but not necessary)
- Familiarity with the basic linear algebra (any one of MATH 51, MATH 103, MATH 113, or CS 205 would be much more than necessary)

## Course Materials

There is no required textbook for this course. Notes will be posted periodically on the course web site. The following books are recommended as optional reading:

- Richard Duda, Peter Hart and David Stork, *Pattern Classification*, 2nd ed. John Wiley & Sons, 2001.
- Tom Mitchell, *Machine Learning*. McGraw-Hill, 1997.
- Richard Sutton and Andrew Barto, *Reinforcement Learning: An introduction*. MIT Press, 1998
- Trevor Hastie, Robert Tibshirani and Jerome Friedman, *The Elements of Statistical Learning*. Springer, 2009

Course handouts and other materials can be downloaded from <http://www.stanford.edu/class/cs229/materials.html>

## Online Resources

- Home page: <http://cs229.stanford.edu/>
- Student center (homework scores and late days): <https://www.stanford.edu/class/cs229/cgi-bin/student-center.php>
- Current quarter's class videos: Available from SCPD
- Piazza forum
- Staff mailing list: [cs229-qa@cs.stanford.edu](mailto:cs229-qa@cs.stanford.edu) (to contact the teaching staff directly)

**NOTE:** If sending email about a homework, please state in the subject line which assignment and which question the email refers to (e.g., Subject: HW3 Q1). Please send one question per email. If you have a technical or homework or general administrative question that is not confidential or personal, we encourage you to post it on the Piazza forum instead, as that will get you a faster response.

## Homeworks and Grading

There will be four written **homeworks**, one **midterm**, and one major open-ended **term project**. The homeworks will contain written questions and questions that require some Matlab programming. In the term project, you will investigate some interesting aspect of machine learning or apply machine learning to a problem that interests you.

We try very hard to make questions unambiguous, but some ambiguities may remain. Ask if confused or state your assumptions explicitly. Reasonable assumptions will be accepted in case of ambiguous questions.

After you get back a graded homework, you may also be able to regain up to 1/4 of lost points on the homework by submitting a corrected version of a solution. (Because of scheduling and registrar constraints, this will apply only to homeworks 1-3.) The corrected solution to homework N should be stapled on top of homework N and submitted together with homework N+1. Write clearly which questions you are correcting. Do NOT staple the homeworks N and N+1 together or else it will not be graded. More details about this will be provided in later handouts.

**Honor code:** We strongly encourage students to form study groups. Students may discuss and work on homework problems in groups. However, each student must write down the solutions independently, and without referring to written notes from the joint session. In other words, each student must understand the solution well enough in order to reconstruct it by him/herself. In addition, each student should write on the problem set the set of people with whom s/he collaborated.

Further, since we occasionally reuse problem set questions from previous years, we expect students not to copy, refer to, or look at the solutions in preparing their answers. **It is an honor code violation to intentionally refer to a previous year's solutions.** This applies both to the official solutions and to solutions that you or someone else may have written up in a previous year.

**Late Assignments:** Each student will have a total of **seven (7) free late (calendar) days** to use for homeworks, project proposals and project milestones. Once these late days are exhausted, any assignments turned in late will be penalized 20% per late day. However, **no assignment will be accepted more than four days after its due date**, and late days cannot be used for the final project writeup. Each 24 hours or part thereof that a homework is late uses up one full late day.

**Assignment Submission:** To hand in an assignment, write down the date and time of submission, and leave it in the submission box near/outside Gates 188 and 182. Please don't disturb the staff in those offices; directions to the hand-in box are here. **It is an honor code violation to write down the wrong time.** Regular (non-SCPD) students should submit hardcopies of all four written homeworks. Please do not email your homework solutions to us.

**SCPD students:** Please submit your assignments at <https://www.stanford.edu/class/cs229/cgi-bin/submit.php> as a single PDF file under 20MB in size. If you have trouble submitting online, you can also email your submission to [cs229-qa@cs.stanford.edu](mailto:cs229-qa@cs.stanford.edu). However, we strongly recommend using the website submission method as it will provide confirmation of submission, and also allow us to track and return your graded homework to you more easily. If you are scanning your document by cellphone, please check the Piazza forum for recommended cellphone scanning apps and best practices.

The term project may be done in teams of up to three persons. The midterm is open-book/open-notes, and will cover the material of the first part of the course. It will take place on Wednesday, November 4, 6-9 pm (location TBD).

## Sections

To review material from the prerequisites or to supplement the lecture material, there will occasionally be extra discussion sections held on Friday. An announcement will be made whenever one of these sections is held. Attendance at these sections is optional.

## Communication with the Teaching Staff

If you have a question that is not confidential or personal, encourage you to post it on our forum on Piazza. To contact the teaching staff directly, we strongly encourage you to come to office hours. If that is not possible, you can also email us at the course staff list, [cs229-qa@cs.stanford.edu](mailto:cs229-qa@cs.stanford.edu) (consisting of the TAs and the professor). By having questions sent to all of us, you will get answers much more quickly. Of course, confidential or personal questions can still be sent directly to Professor Ng or the TAs.

For grading questions, please talk to us after class or during office hours. If you want a regrade, write an explanation and drop the homework and the explanation into the submission box near Gates 182/188.

Answers to commonly asked questions and clarifications to the homeworks will be posted on the FAQ.