CS106AP Syllabus

Lecturer: Sonja Johnson-Yu
    Email: sonja@cs.stanford.edu
    Office: Gates B02 (in the basement)
    Office hours: Thursdays 2:30pm-4:30pm

Lecturer: Kylie Jue
    Email: kyliej@stanford.edu
    Office: Gates B02 (in the basement)
    Office hours: Tuesdays 10am-12pm

Head TA: Nick Bowman
    Email: nbowman@stanford.edu
    Office: Gates B02 (in the basement)
    Office hours: Tuesdays 2:30pm-4:30pm

I. Class website

The central place for all CS106AP resources is the course website. The site is located at **https://cs106ap.stanford.edu**. You should regularly check the class website for handouts, announcements, and other information, including the most up-to-the-date information on assignments and errata.

II. Course topics

Learning goals

After you're finished with CS106AP, we hope you'll have achieved the following learning goals:

- I am excited to use programming to solve real-world problems I encounter outside class, including those related to my major/career.
- I can break down complex problems into smaller subproblems by applying the logical reasoning skills I have gained from programming.
- I better understand the technology in my everyday life and can identify the programmatic concepts present in these technologies.
- I understand how computers process and organize information.

We'll also be giving you tools to tackle the following questions (note that these don't have single right or wrong answers!):

1. What is possible with technology and code? What isn't possible?

2. How can I use programming to solve problems that I otherwise would not be able to?
3. What makes "good" code and what are the best practices for writing code?

Lecture schedule

While the below schedule is subject to change over the course of the quarter, we will cover the following topics (in approximate order):

1. Karel the Robot
2. Programming basics
3. Console programs
4. Image manipulation
5. Data structures + parsing
6. Graphics programs
7. Object-oriented programming
8. Everyday Python

For a detailed day-by-day topic outline, please see the online course schedule.

III. Course structure

Discussion sections

In addition to lecture, you must also sign up for a weekly 50-minute section. In order to take CS 106AP, you must submit your section preferences **between 5:00pm on Sunday, June 23 and 5:00pm on Tuesday, June 25**. Unlike *Hamilton* tickets, section sign-ups are **not** first-come first-serve. The sign-up form will be available on the web at the URL **https://cs198.stanford.edu**. After a matching process, your section assignments will be emailed out to you by the morning of Wednesday, June 26. Sections begin the first week of classes. Note that you should only sign up for sections at the URL indicated previously (you should not sign-up for sections on Axess).

Some of the programming assignments in this class will be done individually, and for others you will have the option to work in pairs. If you do decide to work in a pair for those assignments, you may only pair with someone in the same section as you. For more on pair programming requirements and instructions for signing up in a pair, see the "Working in pairs" section of this syllabus.

Programming assignments
NOTE: All assignment and revision deadlines are at 11:59pm on the specified day.

There will be six assignments (Assignment 1–Assignment 6), which will become more complex as the quarter progresses. Thus, the later assignments will be weighted slightly more than the earlier ones. Every assignment will be graded by your section leader according to the following scale:

++ An absolutely fantastic submission that will only come along a few times during the quarter across the entire class. To ensure that this score is given only rarely, any grade of ++ must be approved by the instructors and head TA.

+ A submission that is "perfect" or exceeds our standard expectation for the assignment. To receive this grade, a program often reflects additional work beyond the requirements or gets the job done in a particularly elegant way.

✓+ A submission that satisfies all the requirements for the assignment, showing solid functionality as well as good style. It reflects a job well done.

✓ A submission that meets the requirements for the assignment, possibly with a few small problems.

✓– A submission that has problems serious enough to fall short of the requirements for the assignment.

– A submission that has extremely serious problems, but nonetheless shows some effort and understanding.

–– A submission that shows little effort and does not represent passing work.

From past experience, we expect most grades to be ✓+ and ✓. Dividing the grades into categories means that your section leader can spend more time commenting on what you need to learn from the assignment and not have to worry about justifying each point. The overall goal is to maximize the learning experience in doing the assignments, and from a pedagogical perspective over many quarters of experience, we have found the "bucket" grading system to work much better for programming assignments than assigning numeric grades. Along with your final grade on the assignment, your section leader will also provide written feedback on your submission.

Except for the final assignment, you will have the opportunity to submit homework revisions once you have received feedback from your section leader. By submitting a revised assignment, you can earn up to one bucket grade above your original grade, **capped at a ✓**. Revised assignments must:

(1) Fix existing bugs
(2) Not introduce new bugs
(3) Include your own test cases that would have uncovered the bugs previously in your program
(4) Be submitted within three days after the following assignment's first due date. (For example, Assignment 2 is due on 7/10 so revisions for Assignment 1 will be due on 7/13.)

A section leader will grade your revised assignment, but if you do not meet the above requirements, <u>a higher grade is not necessarily guaranteed</u>.

Working in pairs

Many of the assignments in this course must be completed on an individual basis, but some parts of Assignments 4 and onwards will allow you to *optionally* work in a pair with a partner. Each assignment will specify whether or not you can work in pairs. Note that you

are not required to work with a partner on these assignments, but you are encouraged to do so. Working in pairs can improve student learning by giving you someone to talk to when you are stuck or by letting you see a different way of approaching the same problem. You don't have to work in the same team for every assignment and can also choose to work individually on future assignments.

If you choose to work with a partner, you must pair with another student who is currently taking the course _and_ is in your section. If you have a friend you want to work with, you must list the exact same time preferences when signing up for a section. Otherwise, please contact the head TA to request a section swap. Students auditing or sitting in on the course may not work in a pair with a student who is taking the course since people who are not currently enrolled may not submit assignments.

If you submit an assignment as a pair, each of you is expected to make a significant contribution toward solving that assignment. You should not claim to be part of a pair submission if you did not contribute significantly to help solve that program. If you submit an assignment as a pair, you should make ONE submission and make sure that the names of both members of the pair are listed in the comments of the solution. Both members of a pair will receive the same grade.

It goes without saying that regardless of pairs, every student is still responsible for learning all course material. All exams are completed individually. More details about working in pairs will be discussed in class and additional information will be posted on the class website. Please make sure that you follow its guidelines.

Late policy

Assignments 1 through 6 will each have two distinct deadlines:

- "On-time" deadline: Submission by this deadline will result in a 5% added bonus to your final grade on that particular assignment. These bonuses will be added at the end of the quarter and will not be reflected in your individual bucket grades.
- "Extended" deadline: Following the "on-time" deadline, there will be a penalty-free grace period (24-48 hours depending on the assignment), during which students can still submit their work for full credit on the assignment.

Assignments received after the "extended" deadline will have their grade lowered by one bucket per 24-hour period that it is late. For example, a ✓+ assignment that is turned in <24 hours after the "extended" deadline would receive a ✓, and if it is turned in 24-48 hours after the deadline, it would receive a ✓-. Assignments received later than 48 hours following the "extended" deadline will receive a zero.

Note that the "extended" deadline of the last assignment (#6) will be the last day of classes (Wednesday, August 14), and therefore we cannot accept any late submissions for this assignment.

You should think of the grace period following the "on-time" deadline as an extension you have been granted ahead of time. As a result, a penalty-free extension beyond the

"extended" deadline will generally not be granted. In *very special* circumstances (primarily extended medical problems or other emergencies), extensions may be granted beyond the "extended" deadline for submission. All extension requests must be directed to the head TA no later than 24 hours before the program is due. Only the head TA will be able to approve extensions. In particular, do not ask your section leader.

Exams

The midterm examination will be a two-hour test administered outside class on **Monday, July 22**. The exam time will be announced in class once it is finalized. If you have a conflict with the scheduled time and absolutely cannot make the regularly scheduled midterm, you must send a request by email to Nick (**nbowman@stanford.edu**) no later than a week before the scheduled midterm date to arrange an alternate exam. Any alternate midterm will occur within at most one day earlier or later than the regular exam time.

The final examination is scheduled for **Friday, August 16 from 3:30pm-6:30pm**. For a variety of reasons (including university policy), there will be no alternate time for the final exam. Please make sure that you can attend the final exam at the specified time before enrolling in the class. You may bring up to 10 pages of printed notes to the midterm and up to 2 pages of printed notes to the final. The exam will be administered electronically.

Grading

Final grades for the course will be determined using the following weights:

55%	Programming assignments (weighted toward the later assignments)
20%	Final examination
15%	Midterm examination
10%	Section participation

Units

If you are an undergraduate or a high school student, you are required to take CS 106AP for 5 units of credit. If you are a graduate student, you may enroll in CS 106AP for 3 units if it is necessary for you to reduce your units for administrative reasons. Taking the course for reduced units does not imply any change in the course workload.

IV. Course resources

The [Course Communication Guide](#) outlines what channels of communication are appropriate for different types of questions/help resources. Please read it over before contacting course staff.

Office hours (LaIR)

CS106AP provides extensive assistance for students. Section Leaders and Course Helpers are available four days each week for four hours each evening in the Tresidder Union dining area (office hours that we call LaIR). Sections Leaders in Tresidder are there to help you learn to debug your assignments or to help answer conceptual questions. Check the

website **https://cs198.stanford.edu** and click on the "Helper Schedule" link for the latest schedule of Helper Hours.

The course instructors and head TA also hold weekly office hours separate from LaIR. Their times and locations are detailed on the first page of the syllabus and on the course website.

Piazza

We will be using Piazza in this course for students to ask conceptual questions about topics covered in class and clarification questions about assignments and class logistics. The class Piazza is not to be used for debugging help on assignments, and we will remove any posts that include assignment code snippets. To sign up for the CS106AP Piazza, go to this link.

Handouts and texts

Class handouts will be available electronically in PDF format on the CS106AP website. If you prefer printed handouts, you can print a copy from the web. While there is no official textbook for the class, additional resources will also be linked on the course site.

Computer facilities

As in any programming course, the assignments in CS106AP require extensive hands-on use of a computer. Twenty-four hour computer spaces are available in Lathrop Library, Old Union, and most on-campus residential communities. Loaner laptops can also be checked out from the Lathrop Tech Desk. The preferred platform for doing the work is the PyCharm development environment which runs under both Mac OS X and Microsoft Windows. Instructions on obtaining and using the PyCharm environment—which is an open-source software project and therefore free to download—will be distributed in on the course website.

V. Honor Code

As a student taking a Stanford course, you agree to abide by the Stanford Honor Code, and we expect you to read over and follow the CS-specific Honor Code expectations detailed on the CS106AP website. Stanford employs powerful automated plagiarism detection tools that compare assignment submissions with other submissions from the current and previous quarters, as well as related online resources. The tools also analyze your intermediate work, and we will run the tools on every assignment you submit.

If we find that you have violated Stanford's Honor Code, you will automatically fail the course. No exceptions can be made to this policy.

That's all folks! Welcome to CS106AP.