

Python with Applications I

PIC 16A, Winter 2024

Logistics

Course website: <https://bruinlearn.ucla.edu/courses/176868>

Lecture 3: MWF 1-1:50pm Geology 4660

Discussion 3A: TR 1-1:50pm MS 5117

Discussion 3B: TR 2-2:50pm MS 5117

Instructor: Seyoon Ko (kose@math.ucla.edu).

Office hours: W 2-3:30pm MS 6324

Teaching assistant: Vasu Eranki (vasueranki@ucla.edu)

TA Office hours: TBD

The office hours are subject to change, so please always check the [Bruin Learn course website](#) for the latest office hours.

Waitlist policy: PIC doesn't use PTEs. Please see the relevant policy posted on [this website](#). If you're on the waitlist, you can expect to be enrolled after the waitlist period is over (week 2).

Course prerequisites: PIC 10A or CS 31 (enforced)

Textbook: None! Often, a nice step to take when you face an error is reading the error messages → official documentation → Stack Overflow → other resources in Google.

Official documentation: <https://docs.python.org/3/library/index.html>

Official tutorial: <https://docs.python.org/3/tutorial/index.html>

Overview

(Formerly numbered Programming in Computing 16.) Lecture, three hours; discussion, two hour. Requisites: course 10A, Computer Science 31 or equivalent. In depth introduction to the Python programming language for students who have already taken a beginning programming course in a strongly typed, compiled language (C++, C or Fortran). Core Python language constructs, applications, text processing, data visualization, interaction with spreadsheets and SQL data bases, and creation of graphical user interfaces. P/NP or letter grading.

Course objectives: The student will be familiar with the core Python language components, including program syntax, fundamental data types, flow control, file and console I/O,

the creation of functions, the creation and use of classes. The student will be familiar with the Python interpreter, Python notebooks, and Python integrated development environments. In addition, the student will be capable of both creating and using Python modules.

Topics (tentative):

- Python basics – variables, data types, control flow, functions, Python keywords
- More advanced Python syntax: classes, inheritance, object oriented programming, exceptions, magic methods, I/O
- Programming skills: using tools (e.g. Anaconda, Jupyter-lab, VScode), version control with Git, understanding Python package structure, understanding Python dependencies, debugging, commenting, reading and writing documentation, code reproducibility
- Applications and packages:
 - Matrix operations with Numpy
 - Data wrangling with Pandas
 - Data visualization with Matplotlib
 - Machine learning with Scikit-learn
 - Natural language processing with NLTK
 - Regular expressions with re

Grades

This class has 7 homework assignments, group discussion assignments, a mini group project, quizzes, a midterm exam, and the final exam. The final grades will be calculated by the following criteria:

- 25% Homework assignments
- 10% Discussion participation
- 10% Mini-project
- 5% (low-pressure) Quiz
- 20% Midterm exam (2/12 Monday)
- 30% Final exam

If you miss the midterm for a legitimate reason (incl. illness and family emergency), final exam will weigh 50%, without changing weights of other items.

Letter grade cutoffs

- A+: 99% + outstanding participation
- A: 93
- A-: 90
- B+: 87
- B: 83
- B-: 80
- C+: 77

- C: 73
- C-: 70
- D+: 67
- D: 63
- D-: 60

I reserve the right to be more generous than this scheme. Collaboration can only help you in this setting, so please ask lots of questions and talk through tough problems with your peers!

Attendance

Lecture attendance is expected. Most lectures will not be recorded unless there is an absolute need. Discussion attendance is required, where you have to participate in group activities.

Lecture structure

MWF lectures will be delivered in-person. I will *not* take attendance, but I encourage you to join as often as you can. If there are any slides, notes, videos, or code files used during the lecture, I will upload them to BruinLearn by the end of the day. Lectures will not be streamed online via Zoom unless otherwise specified.

Discussion structure

This is where you will learn the most. TR discussions will be centered around group activities with the help of the TA. Your worksheet will be graded mostly on effort, but you do need to be present to get credit for that session. You can still get full credit if you miss up to 3 discussion sections, so if you have to miss a day for any reason, don't worry and just count it towards one of your drops.

Homework structure

Homeworks are tough, but you will learn a lot. Collaboration is encouraged, but everyone should still write and submit their own homework. The lowest homework score will be dropped. Homeworks can be submitted up to 2 days late, at a discount of 10% points per 24 hours past the deadline, rounded up. For example, if you turn in a homework 20 hours late that would have received a 98%, your grade will be an 88%. If you turned it in 39 hours late your grade would be a 78%. Homework assignments turned in more than 2 days (48 hours) late will receive 0% unless you've received an extension from me.

Project structure

You will work on a project with your discussion group. Working on a project with real data and/or users is the best way to learn "how to make things from scratch," and I want you

to have something published on Github that you can be proud of by the end of this course. More detailed instructions to follow around the midterm exam.

Mini-quiz structure

These quizzes are only here to help you identify the big gaps in your understanding right away instead of waiting until the exam week. I will not drop any mini-quiz scores, but you get multiple attempts.

Exam structure

Midterm will be held in-class, on Monday, Feb 12, 2024. Final will be held during the Final Exam Block, on 3-6 pm Monday, Mar 18, 2024.

Other Information

Our inclusive learning environment: UCLA values diversity and inclusion. We expect everyone in this class to contribute to a respectful, welcoming, and inclusive environment to support the learning of all other members of the class. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify us.

Notice about academic integrity: From the office of the Dean of Students:

“With its status as a world-class research institution, it is critical that the University uphold the highest standards of integrity both inside and outside the classroom. As a student and member of the UCLA community, you are expected to demonstrate integrity in all of your academic endeavors. Accordingly, when accusations of academic dishonesty occur, The Office of the Dean of Students is charged with investigating and adjudicating suspected violations. Academic dishonesty includes, but is not limited to, cheating, fabrication, plagiarism, multiple submissions, or facilitating academic misconduct.”

Students are expected to be aware of the University policy on academic integrity in the UCLA Student Conduct Code:

<https://www.deanofstudents.ucla.edu/Individual-Student-Code>

Please note the sections on (1) cheating, (2) plagiarism, and (3) unauthorized study aids.