



ITP-216 Applied Python

Units: 2

Location: TBD

Instructors: Greg Pohlner

Office: Zoom

Office Hours: Posted on Piazza

Contact Info:

For all questions about assignments or generally pertaining to the course: Piazza.

For all other questions, email: pohlner@usc.edu

Teaching Assistants: TBD

Office: Zoom

Office Hours: Posted on Piazza

IT Help: Viterbi IT

Hours of Service:

Monday – Friday, 8:30 a.m. – 5:00 p.m.

Contact Info:

DRB 205

(213) 740-0517

engrhelp@usc.edu

Course Description

This course focuses on development of practical Python programming skills through project-based application. It is split into two parts: part one focuses on powerful features of the Python programming language itself (“Pythonic” programming), which allow students to quickly and easily manipulate data in ways not found in other languages. Part two focuses on application of modules to solve domain-specific challenges, such as in scientific computation and data visualization, system manipulation and automation, web development, and machine learning.

Learning Objectives

By the end of this course, students should be able to:

- Understand “Pythonic” programming techniques
- Create a computational-thinking-based plan for solving a programming challenge
- Implement a solution to a programming challenge
- Evaluate the effectiveness of a program
- Generate, organize, analyze, and interpret data in a variety of domain-specific settings

Prerequisite(s): ITP-115 or equivalent

Course Notes

This course will make use of several tools for delivery of content and assignments, and for general communication. Blackboard (<http://blackboard.usc.edu>) will serve as the entry-point to all of this. Lecture slides and any

supplemental course content will be posted to Blackboard for use by all students. All assignments will be posted to Blackboard and will be submitted through Blackboard. General assignment help and communication will be done through Piazza, an invite to which will be sent at the beginning of the semester, and a link to which will be posted in Blackboard. Please familiarize yourself with Blackboard before the course begins.

Adding the course after the first week

Per university policy, students are allowed to add the course until the end of week three. Any students wishing to add the course should plan on attending the course from the beginning of the semester. If the student needs to add the course after week 1, they will need to apply for D-Clearance. Upon getting D Clearance, students will need to reach out to advising to add the class, and have the number of weeks late to become current, e.g. if a student added Week 2, they must become current by Week 4; added Week 3, current by Week 6, etc.

Technological Proficiency and Hardware/Software Required

Students will need a computer (laptop or desktop) and access to the internet. If you do not have access to a computer, please see below. The software needed for this course is available for free online. All homework and projects will need this software to be completed (available for Mac and Windows). Download the latest version of **Python 3** at <https://www.python.org/downloads/>.

You will also need to download and install PyCharm, which is an integrated design environment (IDE) for creating an ITP 216 project and writing code. Download the latest version of **PyCharm Professional Edition** at <https://www.jetbrains.com/pycharm/download/>. See Assignment 0 on BlackBoard Week 1 Weekly Module for detailed installation instructions.

USC Technology Rental Program

If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program. To apply, please [submit an application](#). The Student Basic Needs team will contact all applicants and distribute equipment to eligible applicants prior to the start of the semester.

ITP Computers

ITP has a limited number of laptops that are available to borrow for ITP classes. Eligible students will be able to borrow a MacBook or Dell XPS for ITP coursework once their request is approved and their contract is signed via DocuSign. Though the initial loan period is 7 days, they will still be able to renew their device and extend the loan period as in previous semesters. They will need to pop into one of ITP's Zoom device check-in sessions before the end of each week. If all of them have been checked out, then the student will be placed on the waiting list. You will not be able to save your work on the ITP lab computers and the ITP laptops. Once they are restarted, all work will be deleted. Use an external USB drive, or a cloud-based service like Google Drive or Dropbox to save your work. ITP is not responsible for any lost work. Information about the ITP Loaner Laptop Program and the request form can be found at <https://itp.usc.edu/current-students/itp-device-check-outs/>.

Required Readings and Supplementary Materials

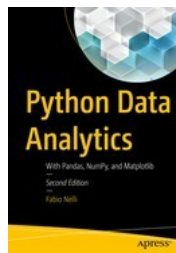
Required materials: None

Supplementary Materials:



Automate the Boring Stuff with Python 2e

<https://learning.oreilly.com/library/view/automate-the-boring/9781098122584/>



Python Data Analytics: With Pandas, NumPy, and Matplotlib

<https://learning.oreilly.com/library/view/python-data-analytics/9781484239131/>



Think Python 2e

<https://learning.oreilly.com/library/view/think-python-2nd/9781491939406/>



Head-First Python

<https://learning.oreilly.com/library/view/head-first-python/9781491919521/>

Additional reference material will be provided as needed.

Course Grading Breakdown

Item	% of grade
Homework	50
Labs	10
Test (one)	10
Final Project	30
TOTAL	100

Grading Scale

Course final grades will be determined using the following scale

A	>= 93
A-	>= 90 and < 93
B+	>= 87 and < 90
B	>= 83 and < 87
B-	>= 80 and < 83
C+	>= 77 and < 80
C	>= 73 and < 77
C-	>= 70 and < 73
D+	>= 67 and < 70
D	>= 65 and < 67
F	< 65

For the Pass/No Pass grading option, you must earn at least 70% to pass.

Assignments

There are two types of assignments in this course:

- **Homework:** week-long assignments which pertain to the material from the current week as well as to previous weeks.
- **Lab:** short, direct application of the week's topics for reinforcement.

Generally, each week there will be one Homework and one Lab assigned, each of which relate to the topic covered that particular week. **Students are expected to complete these assignments individually.** Each assignment will include instructions, a due date, and a link for electronic submission. Assignments must be submitted using this link; they will not be accepted through any other method.

Student Implementation

A note on implementation: All assignments (labs and homework) must only utilize language features and libraries explicitly covered in ITP-115, ITP-116, or ITP-216 previous weeks lectures, lecture code provided by instruction staff members, labs, or assignments. If you didn't take ITP-115 or ITP-116 or forget what was covered, please reference the ITP-115 or ITP-116 Syllabus available on the USC Schedule of Classes and "ITP-115 YouTube Playlist" and ITP-115 lecture pdfs available on BlackBoard for a review. The learning objectives for each lab and assignment are designed to exercise application of the concepts covered in the current and previous weeks lectures.

- For example, if we are covering manually updating and looping over a dictionary's items, using the `zip()` function or unpacking star/asterisk operator, using `collections.Counter()`, etc. would defeat the learning objective of the `for` and `while` loop assignments. Moreover, most of the time, these advanced language features are covered in a subsequent week's lecture and will be assessed with a more appropriate lab and/or assignment at that time.

Consequence: Side stepping the learning objectives by using techniques not explicitly covered in the course material to date pedagogically defeats the purpose of the assignment and will result in 0 points for the assignment.

Assignment Late Policy

It is the student's responsibility to submit assignments on or before the due date. Assignments may be submitted within three days with a late penalty. Assignments are subject to a 15% per day late penalty up to a maximum of three days late. i.e. Assignments turned within one day (>1 hour and <=24 hours) late will have 15% of the total points deducted from the graded score. Assignments turned in over one day and up to two days (> 24 hours and <= 48 hours) late will have 30% of the total points deducted from the graded score. Assignments turned in over two days and up to three days (> 48 hours and <= 72 hours) late will have 45% of the total points deducted from the graded score. After three days, submissions will not be accepted, and the score for the assignment will be a 0.

We are unable to accept late labs or final projects.

You may ask for an assignment's late policy to be waived for various reasons. This needs to be approved **before** the due date of the assignment. To ask for a waiver, please contact the instructor via email. Do not contact LAs for this since they are not authorized to approve these requests.

Assignment Grading Timeline

Assignments will be graded within two weeks. Students have one week to contest a grade once it has been posted on Blackboard. After this one week, the grade will not be changed. To contest a grade, create a private post on Piazza and select the grades folder. In the post, include your name, your instructor, your section, the assignment name, and your reasons. This will allow the grader, instructor, and head LA (Learning Assistant) to view your submission and make a decision. Do not email the grader directly. All communication regarding grading issues needs to be seen and approved by the instructor.

Attendance

Attendance is not part of the grading breakdown, although attending classes will help you learn the material and succeed in this course. If you are not able to attend synchronously, then it is your responsibility to watch the recorded lectures and complete the in-class labs.

Classroom Etiquette

The instructor expects you to pay attention during lectures and be an active learner. Chatting while the instructor is talking, texting on your mobile device, and participating on social media sites during class is disrespectful to the instructor, the TAs, and your fellow classmates. If you are not able to attend lectures, then you should watch the recorded lectures available on BlackBoard Zoom Cloud and still complete the in-class labs.

Joint Educational Project (JEP)

The Joint Educational Project (JEP) is a program that allows students to teach material learned in college classes to K12 students in the local community. The JEP commitment is approximately 2 hours/week for 8 weeks. For successful completion of JEP, based on the requirements as set by JEP, you will earn 1/3 of a letter grade extra credit, meaning if you earn a B- in the class, you will receive a B. You will need to sign up by Friday of week 2 at <https://dornsife.usc.edu/joint-educational-project/sign-up/>. More information is available on that website.

Communication

The preferred way to communicate with instructors and LAs is posting on Piazza (<http://piazza.com>). All ITP 216 students, instructors, and LAs will have access to the same class on Piazza. Information about accessing Piazza is available on Blackboard. If you have questions about assignments, labs, tests, and other aspects about this course, please post on Piazza. You are able to make public posts that all members can see and answer or private posts to individuals which are only accessible to instructors and LAs. To make a private post to all instructors and LAs, next to "Post to" select the "Individual Students(s) / Instructor(s)" option and enter "Instructors" in the text field.

Students should NOT directly email the LAs or graders: all correspondence with the LAs should be done on Piazza. If a direct email is required for any reason, the student must cc the instructor in the email.

OSAS Accommodations

If you have course accommodations authorized by OSAS (Office of Student Accessibility Services), please email the instructor or post privately on Piazza and attach your accommodation letter by the end of Week 3. In the body of the message, include your name and your class section. In addition, reach out the week before the test to discuss details for coordinating specific test accommodations.

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the [Office of Academic Integrity](#).

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage. The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

Assignments and projects in computer programming courses are *different* from those in some other types of courses. Students may NOT collaborate, work together, share code, or in any way exchange solutions for assignments and projects. Assignments may be analyzed by software that looks for similarities. Any sharing of ideas or code will be considered a violation of academic integrity (cheating). Do not share your code with anyone else in this or any future section of the course, as allowing someone else to copy your code carries the same penalty as you copying the code yourself. Do not submit another person's work as your own. Do not look at other students' papers during tests. Using any AI, including but not limited to e.g., ChatGPT, etc. to help complete any coursework (including assignments, labs, and exams) for the course is also an academic integrity violation and will be handled as such. Do not collaborate during online tests. Do not cheat!

Past students that have been found to have violated academic integrity standards have each received a 0 on the assignments and projects. Many times this has led to an F in the course.

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Do not reproduce, distribute, or post any lecture material, assignments, or tests publicly without the written consent of the instructor. Students may take notes and make copies of course materials for their own use. Students may not post the course materials on sites such as CourseHero and Chegg. Doing so is a copyright violation and an academic integrity violation that will be dealt with accordingly.

Assignment Submission Policy

All assignments must be submitted through Blackboard; a link will be provided for each. They will not be accepted through any other method.

Tests

No make-up tests (except for documented medical or family emergencies) will be offered. If you will not be able to attend a test due to an athletic game or other valid reason, then you must coordinate with the instructor before the test is given. You may arrange to take the test before you leave with an approved university personnel during the time you are gone, or within the week the test is given. If you do not take a test, then you will receive a 0 for the test. If you need accommodations authorized by OSAS, notify the instructor at least two weeks before the test. This will allow time for arrangements to be made.

Final Project

Description

There will be a final project in this course which aims to solve a real-world problem by applying Pythonic techniques. Each student will conceive of, design, build, test, and verify a solution for the given problem.

The implementation of the final project itself will be a web app which incorporates two or more of the various computational domains covered during the semester. The concept of the app is up to the student; the project proposal must be approved by the instructor. The proposal should include a generalized description of the solution app, the target audience, and a description of which computational domains it will incorporate.

The final project will be graded on how it fulfills the requirements and the quality and completion of the app. **The Final Project must represent the student's sole effort.**

Schedule

Week	Event
11	Project assigned
13 through 16	Work on Final Projects
16 (Final exam period)	Due: Final Project

Final Project Grading Breakdown

Item	% of grade
Web app component	40
Computational domain 1 component	30
Computational domain 2 component	30
TOTAL	100

Course Schedule: A Weekly Breakdown

Week	Topics	Supplementary Reading	Assigned work	Due
1	Introduction: problem-solving, Python IO and tools	Automate Ch 1, 2	-	-
2	Python Core: sequence, selection, iterate, and data types	Think Python Ch 13	L02, H02	L02, H02
3	Python Core: functions	Automate Ch 3	L03, H03	L03, H03
4	Objects and Classes: the basics	Think Python Ch 17, 18	L04, H04	L04, H04
5	Objects and Classes: packages and modules	Automate Appendix A	L05, H05	L05, H05
6	<i>Pythonic</i> : iterators, comprehensions, and generators	Think Python Ch 19	L06, H06	L06, H06
7	<i>Pythonic</i> : first-class objects (decorators, functional programming)	Head First Ch 10	L07	L07, H07
8	Test 01; Debugging	-		
9	Web Part 1: Scraping	Automate Ch 12	L09, H09	L09, H09
10	Web Part 2: Databases, backend	Automate Ch 16	L10, H10	L10, H10
11	Web Part 3: APIs, frontend	Head First Ch 5	L11, H11, FINAL PROJECT	L11, H11
12	Scientific Computation	Python Data Analytics Ch 3, 4	L12, H12	L12, H12
13	Data Visualization	Python Data Analytics Ch 6	L13	L13

14	Machine Learning part 1	Python Data Analytics Ch 8, 9	L14	L14
15	Machine Learning part 2		-	-
FINALS	FINAL PROJECT DUE DURING FINALS WEEK	Date: TBA DURING FINALS WEEKS		

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Using any AI, including but not limited to e.g., ChatGPT, etc. to help complete any coursework (including assignments, labs, and exams) for the course is also an academic integrity violation and will be handled as such. to help complete any coursework (including assignments, labs, and exams) for the course is also an academic integrity violation and will be handled as such.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Support Systems:

Counseling and Mental Health - (213) 740-9355 - 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 - 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours - 24/7 on call

studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX - (213) 821-8298

equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 - 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 - 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.