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ITP-499 Applied Python

Units: 2

Semester: Fall 2020

Section: Various

Days: Various

Times: Various

Location: Various

Instructors: Kristof Aldenderfer
Yoofi Quansah

Office: Listed on Blackboard

Office Hours: Listed on Blackboard

Contact Info: Listed on Blackboard

Course Teaching Assistants: Listed on Blackboard

Office Hours: Listed on Blackboard

Contact Info: Listed on Blackboard

IT Help: Provided by Viterbi IT

Hours of Service: 8am–5pm Pacific M–F

Walk-in: DRB 205

Contact Info: (213) 740–0517

Email: engrhelp@usc.edu

Course Outline

Course Description

This course teaches students advanced features of the Python programming language (“Pythonic” programming). These structures and syntax allow us to quickly and easily manipulate data in ways not found in other languages. In addition, we will explore the multitude of available Python modules and then use them to solve problems in domain-specific areas such as scientific computation, data visualization, system automation and manipulation, DevOps, and markup processing.

Learning Objectives

- Develop fluency in using Python modules
- Decipher and apply modules to domain-specific problems
- Develop custom Python modules

Prerequisite(s): ITP 115

Co-Requisite(s): none

Concurrent Enrollment: none

Course Notes

All course content (lecture slides, labs, assignments, et al.) will be posted on Blackboard. All course discussions will occur on Piazza.

Requisites

Technological Proficiency and Hardware/Software Required

Students should have access to their own computer running either Windows, MacOS, or Linux, and should be familiar with the basic operation of their computer.

Required Readings and Supplementary Materials

Required readings will be posted available online for free through the USC library via <https://proquest-safaribooksonline-com.libproxy2.usc.edu/>

Software

The software needed for this course is available for free online. All homework and projects will need this software to be completed (available for Linux, MacOS, and Windows).

Python 3.x <https://www.python.org/downloads/>

PyCharm <http://www.jetbrains.com/pycharm/download/> (Free Community Edition)

Description and Assessment of Assignments

There are programming assignments in this course, and students will have one to two weeks to complete each assignment. Each assignment will apply novel Python language elements to a specific domain. Students are expected to complete these programming assignments individually. Each assignment’s instructions will include a grading rubric for that assignment

Assigned Work and Grading

Grading Breakdown

Assignment	% of grade
Assignments	50
Labs	5
Midterm Test	20
Final Project	25
Total	100

Grading Scale

Course final grades will be determined using the following scale:

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	65-66
F	64 and below

Assignment Submission Policy

All assigned work will be submitted through Blackboard.

Grading Timeline

Assigned work will generally be graded within one week.

Policies and Expectations

Students are expected to:

- Attend and participate in lecture discussions.
- Attend and complete weekly assignments.

Grading Issues

Students will have one week after graded feedback is given to contest scores (e.g. assignments, midterm, and project). After two weeks, scores will not be changed.

Course Schedule

Week	Topics/Daily Activities	Readings	Assignment	Due
1	Python Review <ul style="list-style-type: none"> Function Loops Objects 	Introducing Python chs 4, 6 (ISBN: 978-1-4493-5936-2)	A01 for section 31855 (extra credit)	
2	Pythonic Part 1 <ul style="list-style-type: none"> List comprehensions Itertools 	Fluent Python chs 1-3 (ISBN: 978-1-4919-4600-8)	A02	A01
3	Pythonic Part 2 <ul style="list-style-type: none"> Generators Decorators 	Fluent Python chs 7, 14 (ISBN: 978-1-4919-4600-8)		
4	Pythonic Part 3 <ul style="list-style-type: none"> Lambdas Functional programming 	Fluent Python chs 5, 6 (ISBN: 978-1-4919-4600-8)		
5	Scientific Computation <ul style="list-style-type: none"> NumPy, PANDAS, SciPy 	Python for Data Analysis, 2nd Edition chs 4-5 (ISBN: 978-1-4919-5766-0)	A05	A02
6	Data Visualization <ul style="list-style-type: none"> Matplotlib, Plotly 	Python for Data Analysis, 2nd Edition chs 6-8 (ISBN: 978-1-4919-5766-0)		
7	Midterm exam	-		A05
8	GUI	Resources will be posted online	A08	
9	Virtualenv <ul style="list-style-type: none"> Pi (python package installer) 	Resources will be posted online		
10	Client/server architecture <ul style="list-style-type: none"> Flask web framework 	Resources will be posted online		
11	Markup Manipulation <ul style="list-style-type: none"> Processing and creating XML, YAML, JSON 	Resources will be posted online	A09, Final Project	A08
12	Databases	Resources will be posted online		
13	TBD (Beautiful Soup, Devops, scripting/automation – make files, start services, poll VMs, Machine learning [Scikit learn, KNN])	Resources will be posted online		A09
FINAL	Final Project	Date: TBD		

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

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.