

DATA *: Python Module

Spring 2022

Instructor Information

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Classroom:
Class Time:
Office Hours:

Course Description

This course provides an introduction to the programming in python with a goal of supporting you in later coursework in the Data Analytics major. A main goal of the course is that you will have plenty of opportunities to work with real data and the Python programming language. Thus, we will integrate standard introductory topics in programming with examples that incorporate a variety of datasets.

Course Materials

There is no required textbook to be purchased for this course, as we will be making use of open source and online materials all semester. The following textbooks below are available as free .pdfs and will be referenced during lectures and assignments. You may find the texts on the remainder of the list to be useful additional supplementary resources but access to them will not be required. Data sets and programming scripts for the course will be uploaded to the course webspace.

- Open-source resources:
 - [Problem Solving with Python](#)
 - [Automate the boring stuff](#)
 - [Python Data Science Handbook](#)
 - [Think Python](#)
 - [A Bite of Python](#)
 - [Dive into Python 3](#)

Software

This course provides training and examples using the Python programming language. Python is an open source language with a robust ecosystem of packages for data analytics that has become the predominant programming environment in data science¹ **No previous programming experience or knowledge of statistical software tools will be assumed. We will start with the basics of Python 3 and build up familiarity with standard data science libraries including numpy and pandas.**

¹In 2018, Kaggle surveyed 23,859 data scientists and found that 83% of them used python on a regular basis and 54% of them used python most frequently among all languages: [link](#).

Class Communication

We will use the Canvas forums for course discussions. This is a great place to ask questions from your peers, as well as to get feedback on your ideas. Announcements and other official communications will be posted on Canvas as well as sent to your official WSU email accounts. You should check these messages regularly to stay informed about upcoming due dates and updates to the syllabus.

I am accessible by email at daryl.deford@wsu.edu. Please include the name of the course in the subject line for any messages concerning the course. I will commit to responding within 48 hours but this does mean that queries sent immediately before a deadline may not receive substantive responses in time to be directly helpful, so please plan ahead ☺

Participation Expectations

This course is intended to be self-paced and you are expected to work through all of the provided examples and materials. Each week there will be several suggested readings that go along with the material. Several of the textbook sections conclude with review questions, and while you are not required to submit answers to these, they can serve as an invaluable source of feedback on your progress and learning.

Learning Outcomes

Students who successfully complete the course will be able to:

- Create and understand simple Python programs
- Create functions and use standard flow-control procedures in Python
- Demonstrate familiarity with Python's pre-built data types and packages
- Load and summarize data in Python
- Perform basic data cleaning operations in Python
- Merge, transform, and aggregate datasets in Python
- Create simple visualizations in Python
- Solve simple problems using program design in Python

Assessments

Weekly Assignments: Each course module includes a set of questions for you to answer, providing some additional practice with the material. These problem sets are due weekly, and should be submitted in the form of a Jupyter notebook, with text responses formatted in markdown cells. The questions will be a mixture of short answer questions designed to help you review the new concepts and programming questions that will require you to modify existing scripts or write your own code.

Collaboration Policy

For the assignments you are encouraged to work with other students in the class. However, the work that you submit should be your own and in particular should be written in your own words and communicate your own understanding of the solution. If you do collaborate, please list the names of the other students you worked with on your submission. Obtaining solutions from external sources like chegg or coursehero for course problems will be considered a violation of the academic integrity policy with consequences described below.

Grading Policy

This course is graded P/F based on your completion of the module assignments.

Weekly Topics

The following outline describes the overall plan for our class modules.

1. Week 1

- Introduction and installation
- Readings:
 - Problem Solving with Python Chapters 1 and 2
 - A Byte of Python: Why Python
 - Think Python: The Way of the Program

2. Week 2

- Arithmetic, variables, and data types
- Readings:
 - Problem Solving with Python Chapter 3
 - Automate the Boring Stuff Chapter 1

3. Week 3

- Installing, importing, and using modules (math, random, time, requests)
- Readings:
 - PyPI.org

4. Week 4

- Data structures (lists, dictionaries, and sets)
- Readings:
 - Problem Solving with Python Chapter 4
 - Automate the Boring Stuff Chapters 4 and 5

5. Week 5

- Loading and summarizing data with Pandas
- Readings:
 - Python Data Science Handbook Sections 3.1-3.3

6. Week 6

- Introduction to plotting
- Readings:
 - Problem Solving with Python Chapter 6
 - Automate the Boring Stuff Chapter 4

7. Week 7

- More Matplotlib
- Readings:
 - Problem Solving with Python Chapter 6
 - Automate the Boring Stuff Chapter 4

8. Week 8

- Conditional expressions
- Readings:
 - Think Python: Sections 5.1-5.7
 - Problem Solving with Python Chapter 8

9. Week 9

- Loops
- Readings:
 - Problem Solving with Python Chapter 9
 - Automate the Boring Stuff Chapter 2
 - A Byte of Python: Control Flow

10. Week 10

- Data Cleaning
- Readings:
 - The Python Data Science Handbook Sections 3.4-3.7 and 3.10

11. Week 11

- Groupby and Pivot
- Readings:
 - The Python Data Science Handbook Sections 3.8-3.8

12. Week 12

- Functions
- Readings:
 - Problem Solving with Python Chapter 7
 - Automate the Boring Stuff Chapter 3

13. Week 13

- Problem solving with functions
- Readings:
 - A Byte of Python: Problem Solving
 - Think Python: Functions

14. Week 14

- Scientific and data packages (numpy, scipy.stats, sklearn)
- Readings:
 - The Python Data Science Handbook Chapter 5

15. Week 15

- Social Network Analysis
- Readings:
 - Instructor Materials

University Policy Statements

Academic Integrity Statement

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(4)) will fail the assignment, will not have the option to withdraw from the course pending an appeal, and will be reported to the Center for Community Standards. Multiple violations of the policy will cause you to fail the course.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of **the definitions of cheating**. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at **communitystandards.wsu.edu**. Make sure you submit your appeal within 21 calendar days of the faculty member's decision.

WSU Reasonable Accommodation Statement

Reasonable accommodations are available for students with documented disabilities or chronic medical or psychological conditions. If you have a disability and need accommodations to fully participate in this class, please visit your campus' Access Center/Services website to follow published procedures to request accommodations. Students may also contact their campus offices to schedule an appointment with a Disability Specialist. All disability related accommodations are to be approved through the Access Center/Services on your campus. It is a university expectation that students visit with instructors (via email, Zoom, or in person) to discuss logistics within two weeks after they have officially requested their accommodations. For more information contact a Disability Specialist on your home campus:

- Pullman, WSU Global Campus, Everett, Bremerton, and Puyallup: 509-335-3417 Access Center (**<https://www.accesscenter.wsu.edu>**) or email at **access.center@wsu.edu**.

Religious Accommodation Statement

Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact

student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 – Academic Complaint Procedures.

Expectations for Student Effort

Students should expect to spend a minimum of 9 hours per week, engaged in the following types of activities: reading, listening to/viewing media, discussion, or conversation in the LMS or other academic technology, conducting research, completing assignments and reviewing instructor feedback, studying for and completing assessments, etc

Safety and Emergency Notification

Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act,” protocol for all types of emergencies and the “**Run, Hide, Fight**” response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the **FBI’s Run, Hide, Fight video** and visit the **WSU safety portal**.

Full details can be found at <https://provost.wsu.edu/classroom-safety/>

Discrimination and Harassment Policy Statement

Discrimination, including discriminatory harassment, sexual harassment, and sexual misconduct (including stalking, intimate partner violence, and sexual violence) is prohibited at WSU (See **WSU Policy Prohibiting Discrimination and Harassment** (Executive Policy 15) and **WSU Standards of Conduct for Students**).

If you feel you have experienced or have witnessed discriminatory conduct, you can contact the WSU Compliance & Civil Rights (CCR) and/or the **WSU Title IX Coordinator** at 509-335-8288 to discuss resources, including confidential resources, and reporting options. (Visit ccr.wsu.edu for more information).

Most WSU employees, including faculty, who have information regarding sexual harassment or sexual misconduct are required to report the information to CCR or a designated Title IX Coordinator or Liaison. (Visit ccr.wsu.edu/reporting-requirements for more info).

Online Discussion Policy

The essence of education is exposure to diverse viewpoints. In your discussion posts you’ll meet students with vastly different opinions and backgrounds. You’re encouraged to disagree with the substance of others’ ideas and opinions but do so with an active sense of respect for one another, and without losing focus on the topic at hand. Personal attacks, inflammatory statements, flaming, trolling, and disruption of the discussion do not have a place in academic discourse. Postings must comply with University policy on use of computing resources, including those regarding harassment and discrimination, as well as conform to the **WSU Community Standards**.

Your instructors will promote high-quality academic discussions by removing any posts they view as disruptive of the educational process and alerting students whose posts have been removed that they have violated course expectations. Students who continue to misuse the discussion boards after a warning may be subject to removal of access rights, course failure, and referral to the Office of Community Standards. Visit [netiquette guidelines](#).