NYU | ROBERT F. WAGNER GRADUATE SCHOOL OF PUBLIC SERVICE

PADM-GP 4506
Python Coding for Public Policy
Fall 2019

Instructor Information

- Hannah Kates
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- Office Hours: By appointment

Course Information:

- Class Meeting Times: Thurs, 10/24 - 12/12 6:45 - 8:25pm
- Class Location: 194 Mercer Street, Room 305

Course Prerequisites

- Statistics (CORE-GP 1011) or prior knowledge of statistics or programming

Course Description

This 7-week mini course exposes the students to the application and use of Python for data analytics in setting public policy. The course teaches introductory technical programming skills that allow students to learn Python and apply code on pertinent public policy data. The majority of the class content will utilize the New York City 311 Service Requests dataset. It's a rich dataset that can be explored from many angles relevant to real-world public policy and program management responsibilities.

The class period will be split into two parts in order to maximize hands-on learning time:

- **Lecture:** For the first ~40 minutes of class, the professor will work through examples using Python and useful Python packages to analyze data focused on public policy questions. Each lecture will introduce new functionality and skills, building off of concepts covered in previous classes.

- **Lab:** For the remainder of the class period, students will work on their coding homework assignments, either individually or in groups, allowing them to get hands-on practice while the professor and peers are available to answer questions and clarify concepts.

Homework assignments will consist of two different formats:

1. **Online tutorials**: In advance of classes, online tutorials will be assigned as homework. These online tutorials will introduce students to critical Python concepts. The following lecture will then focus on applying those concepts to real public policy data questions.

2. **Data exploration, analysis, and visualization**: Students will complete Python coding exercises that apply new concepts they have learned in lecture. Coding assignments will build off of concepts covered in previous assignments.

Course and Learning Objectives

Students will learn how to use Python in the Google Colaboratory Notebook environment, allowing them to explore and analyze data objects and become familiar with base Python and several Python packages for data manipulation, statistical, and graphing. The course will also teach students to develop their own functions in Python, which they can use to modify or clean datasets. By the end of the course, students will have a framework for exploring data and conducting analyses using Python.

What You Will Take Away

Upon completion of the course, students will be able to

1. Use Python in the Google Colaboratory Notebook environment to understand data objects and how they relate to common analysis of public policy objectives and goals
2. Use Python and popular Python libraries to read in, index, and manipulate data objects
3. Conduct summary statistics on data to explore and understand its content
4. Conduct linear regressions on data and interpret the outputs
5. Produce plots and charts in order to better visualize and present insights from the data
6. Use GitHub to share code which will serve as a portfolio for the students' work

Learning Resources

Applications and Software:

- Google Colab https://colab.research.google.com/notebooks/welcome.ipynb
- Python https://www.python.org
- GitHub https://github.com

NYU Classes

All announcements, resources, and assignments will be delivered through the NYU Classes site. I may modify assignments, due dates, and other aspects of the course as we go through the term with advance notice provided as soon as possible through the course website.

Course Schedule

Date	Topics	Homework
10/24	Introduction to Python, Google Colab Notebook & GitHub. Opening data and exploring the contents	HW0 due (survey & GitHub account creation) HW1 assigned
10/31	Python data structures and Pandas. Data cleanup, iterating with "for" loops, basic summary stats	HW1 due HW2 assigned
11/07	Manipulating and combining Pandas DataFrames, writing functions	HW2 due HW3 assigned
11/14	Data visualization	HW3 due HW4 assigned
11/21	Linear regression and inferential statistics	HW4 due HW5 assigned
11/28	No class: Thanksgiving holiday	
12/05	Working with dates and time series analysis	HW5 due HW6 assigned
12/12	Review course content and topics of student choice	HW6 due HW7 assigned - **Due 12/19**

Assignments and Evaluation

There will be a total of 8 assignments, 7 of which will count towards the final grade. Students are encouraged to look at problem sets in advance of the class that's relevant to the material being tested. This makes the classes more interactive and eases the completion of the assignments.

The Course Grade is based on the following:

- Participation: 10%
- 8 Assignments: 90%
    - HW0: 0%
    - HW1: 12.5%
    - HW2: 12.5%
    - HW3: 12.5%
    - HW4: 12.5%
    - HW5: 12.5%
    - HW6: 12.5%
    - HW7: 15%

Class Policies

A student may work with other students. However, each student should submit their assignment separately. In addition, students need to indicate with whom they have worked in the comments of their submission.

All submissions must be made using a Google Colab Notebook file that has to be uploaded to GitHub. All submissions should follow the style guide that will be provided during the first class.

Attendance is mandatory but most importantly, important. Learning programming requires commitment from the part of the student and the skills are built out of practice.

Student Resources

Wagner offers many quantitative and writing resources as well as skills workshops. The library also offers a variety of data services to students. Here is a short list of the resources most relevant to learning Python.

Wagner Quantitative Resources:

- Tutoring Schedule
- Math Review: Resources and In-Person Session

NYU Library Data Services

- Consultation
- Classes

Academic Integrity

Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by Wagner's Academic Code. All Wagner students have already read and signed the Wagner Academic Oath. Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website and click on the Reasonable Accommodations and How to Register tab or call or email CSD at (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU's Calendar Policy on Religious Holidays

NYU's Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.

Letter Grades

Letter grades for the entire course will be assigned as follows:

Letter Grade	Points
A	4.0 points
A-	3.7 points
B+	3.3 points
B	3.0 points
B-	2.7 points
C+	2.3 points
C	2.0 points

C-	1.7 points
F	0.0 points

Student grades will be assigned according to the following criteria:

- (A) Excellent: Exceptional work for a graduate student. Work at this level is unusually thorough, well-reasoned, creative, methodologically sophisticated, and well written. Work is of exceptional, professional quality.

- (A-) Very good: Very strong work for a graduate student. Work at this level shows signs of creativity, is thorough and well-reasoned, indicates strong understanding of appropriate methodological or analytical approaches, and meets professional standards.

- (B+) Good: Sound work for a graduate student; well-reasoned and thorough, methodologically sound. This is the graduate student grade that indicates the student has fully accomplished the basic objectives of the course.

- (B) Adequate: Competent work for a graduate student even though some weaknesses are evident. Demonstrates competency in the key course objectives but shows some indication that understanding of some important issues is less than complete. Methodological or analytical approaches used are adequate but student has not been thorough or has shown other weaknesses or limitations.

- (B-) Borderline: Weak work for a graduate student; meets the minimal expectations for a graduate student in the course. Understanding of salient issues is somewhat incomplete. Methodological or analytical work performed in the course is minimally adequate. Overall performance, if consistent in graduate courses, would not suffice to sustain graduate status in “good standing.”

- (C/-/+) Deficient: Inadequate work for a graduate student; does not meet the minimal expectations for a graduate student in the course. Work is inadequately developed or flawed by numerous errors and misunderstanding of important issues. Methodological or analytical work performed is weak and fails to demonstrate knowledge or technical competence expected of graduate students.

- (F) Fail: Work fails to meet even minimal expectations for course credit for a graduate student. Performance has been consistently weak in methodology and understanding, with serious limits in many areas. Weaknesses or limits are pervasive.