

Physics 230/Mathematics 230: Data Analysis in Python Spring 2016



Professor:

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Bradley 104, x6266

Class Meeting Times:

PHY/MAT 130 – Mon/Wed 5:10–6:25 PM, Campbell G-15
Office hours Mon/Wed 4:10–5:10 PM
(before 4:30 in Bradley 104, appointments encouraged)

Course Description

This is an activity-based course introducing intermediate programming concepts in the context of practical applications to data analysis and math modeling. Students will learn how to use cutting-edge tools, work collaboratively, and design and write programs based in Python for the purposes of computational modeling and data analysis. Students will use and modify existing programs as well as write their own.

Course Goals

- Design and build small simulations and numerical codes involving mathematical models, including examples from gaming, physics, and forecasting
- Troubleshoot and debug other people's programs
- Automatically retrieve, import, and prepare real data sets (inc. web scraping)
- Perform common data visualizations and tabular summaries of data
- Perform basic data analysis tasks on data
- Learn the basics of project management
- Use version control for collaborative, open source projects

Textbook

Python Data Analysis, Ivan Idris, Packt Publishing
ISBN 9781783553358

Additional resources will be periodically posted on Moodle. These resources may include any programs included in your weekly reading. You should spend a minimum of two hours per week outside of class studying and practicing with the material, including attending workshop and office hour sessions.

Evaluation

Grades will be determined as follows:

Type of Assignment	Percentage
In-class Participation	30%
Midterm Project	20%
Bi-Weekly Programming Assignments	30%
Final Project	20%

Software

If you use your own computer for this course, you must download Python. Python is free to download, and there are many options available to you. We will use the Anaconda distribution, which includes the base language and many numerical and scientific libraries and utilities: <https://www.continuum.io/downloads>

We will also use the Wing IDE Pro (editor and development environment), which you can download from <http://wingware.com>. You will be provided with a free license by email at the beginning of the course. It is superior to the IDE that comes Anaconda, which we will sometimes use too.

I strongly recommend using the Chrome web browser for this course. We will be exchanging files frequently in Google Drive, and the browser allows for easy drag-and-drop. Please do not use Internet Explorer: it does not work well with Moodle.

Getting Help

Programming is a fun and rewarding, but sometimes tiring and difficult, activity. To help alleviate the difficulties that can arise, we will be taking the following steps:

1. Ask questions in class and seek input from your colleagues.
2. Attend office hours.
3. Online forums such as <http://stackoverflow.com> contain vast amounts of help on specific python and data science topics.
4. Ask clear questions to me via email. Please note that any technical questions you send may be shared with the class so that others can benefit from the answer.

Students with Documented Disabilities

Agnes Scott College seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, please contact Kelly Deasy in the Office of Academic Advising (x6150) to complete the registration process. Once registered, please contact me so we can discuss the specific accommodations needed for this course.

Daily Activities:

Each class day, you will have either discussion or a short programming activity to complete. These activities will be spot-checked and feedback will be provided to help you improve your programming. These activities will be graded on a 5 level scale: *no work/effort (0) – minimal effort (1) – some effort (2) – good effort (3) – great effort (4) – excellent effort (5)*

Bi-Weekly Programming Assignments:

Every other week (on average) there will be a programming assignment that will incorporate topics covered during that time period. For these projects, you will create a pseudo-code in a Google doc and then write your programs. I will assess both your pseudo-code and your programs. Details will be included with the individual assignments. I reserve the right to not grade any work submitted after deadlines have passed.

Midterm/Final Project:

The midterm and final project will have both a short answer and a pseudocode/programming component. You will provide at least three days' notice of any excusable absence from an exam, which you should be prepared to provide documentation for (e.g. doctor's note), in order to qualify for a make-up opportunity.

Honor Code and Collaboration Policy:

The Agnes Scott College honor code embodies an ideal of character, conduct, and citizenship, and is an important part of the College's mission and core identity. This applies especially to academic honesty and integrity. Passing off someone else's work as your own represents intellectual fraud and theft, and violates the core values of our academic community. To be honorable, you should understand not only what counts as academic dishonesty, but also how to avoid engaging these practices. In this course, you are permitted to collaborate with your peers, however you are responsible for writing your own code. **You are permitted** to discuss code design and specification with each other, share code snippets when working in groups, and adapt code found online, for use in your work. You must credit all sources of reused or adapted code as in-line comments or in project documentation; otherwise this will be treated as plagiarism.

Course Evaluations:

At the end of the semester you will receive an e-mail asking you to submit an evaluation of the course. Please give feedback! Your input is very important to the college as a whole and to me as a teacher. I take your comments very seriously.

This syllabus provides a general course outline and some deviations may be necessary.