**B8136: Intro to Programming Using Python**

**Spring 2020 (A Term)**

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Office Hours: Available upon request

Section 1: Thursdays 4:00PM – 5:30PM @ Uris 142

Section 2: Thursdays 6:00PM – 7:30PM @ Uris 142

***NOTE: This is a hybrid online/offline course consisting of one and a half (1.5) hours of online video and one and a half (1.5) hours of in-person class time per week. Watching the online videos is mandatory and must be completed before the in-person class each week.***

**Course Description**

This course is an introduction to programming with Python for total beginners. Python is a really popular programming language used by companies like Google, Facebook, Dropbox, Instagram, and Reddit. It’s used for all sorts of things like building websites, web scraping, data analysis, machine learning, and natural language processing. Python is designed to be easy to read and use, while still being very powerful, which makes it a great language for beginners to learn.

In this course, we’ll be learning the basics of programming – variables, strings, lists, functions, and all that stuff – but we’ll be doing it with a focus on business use cases. You’ll learn how to write scripts that automate tedious tasks, read other people’s code, parse and interpret data, interact with APIs, and build web scrapers.

This might be one of the most useful classes you ever take.

**Required Prerequisites**

This course assumes no previous knowledge of programming or code.

**Required Course Material**

* This course does not use a textbook.
* Any required readings will be provided via Canvas.
* Students must have a laptop that they can bring to class – Mac or PC is fine, as long as your operating system is up to date (at least Windows 7 and Mac OS 10.8).
* Slides and files will be uploaded to Canvas after class.

**Online Video**

Each week, students will be expected to watch approximately one and a half hours of additional online video content before attending class. Material in the class will build on the content covered online, and students should be prepared to answer questions related to online material. Video content will be made available via Canvas.

**Course Roadmap/Schedule**

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| **Session** | **Topic** | **Assignments** |
| **Class 1** **(Online)** | **Python Bootcamp**: * Intro to Python
* Command line basics
* Running Python scripts
* Reading code
* Printing
* Errors and debugging
* Comments
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| **Class 1** **(In-Person)**Thursday, Jan 30  | **Python Bootcamp**: * Variables and naming
* Numbers and math
* Strings and text
* Getting user input
 | Pre-Work Due |
| **Class 2** **(Online)** | **Python Bootcamp pt. 2**: * If
* Logic in Python
* Lists
* Loops
* Dictionaries
 |  |
| **Class 2** **(In-Person)**Thursday, Feb 6 | **Python Bootcamp pt. 2**: * Combining lists, loops, and dictionaries
* FizzBuzz challenge
 | Assignment 1 Due |
| **Class 3** **(Online)**  | **Python Bootcamp pt. 3**: * Functions
* Importing
* The Python Standard Library
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| **Class 3** **(In-Person)**Thursday, Feb 13 | **Python Bootcamp pt. 3**: * Functions continued
* Importing continued
* Third-party libraries
 | Assignment 2 Due |
| **Class 4** **(Online)** | **Data Analysis in Python**: * Jupyter Notebook
* Importing data using Pandas
* Exploring DataFrames
* Selecting columns
* Renaming columns
* Sorting
* Exporting
* Running functions on columns
* Selecting rows
 |  |
| **Class 4** **(In-Person)**Thursday, Feb 20 | **Data Analysis in Python**: * Data Cleaning
* Grouping
* Plotting with Matplotlib
* Statistical plotting with Seaborn
* Running linear regressions with StatsModels
 | Assignment 3 Due |
| **Class 5** **(Online)** | **Time Series Data & APIs*** Intro to APIs
* Accessing historical stock data with the Alpha Vantage API
* Getting API keys
* Securing API keys
* Selecting rows from time series data
* Resampling
* Percent change
* Accessing economic data with the FRED API
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| **Class 5** **(In-Person)**Thursday, Feb 27 | **Time Series Data & APIs*** Joining DataFrames
* Dealing with missing data
 | Assignment 4 Due |
| **Class 6****(Online)** | **Web Scraping*** Web scraping using Pandas
* Getting web pages using Requests
* Parsing HTML using BeautifulSoup
* Intro to HTML
* The Web Inspector
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| **Class 6****(In-Person)**Thursday, Mar 5 | **Web Scraping*** Web scraping continued
* Web scraping gotchas
* Advanced web scraping techniques
 | Assignment 5 Due |
| **Due**Sunday, Mar 8Midnight | **Assignment 6 &** **Final Project Proposal**  | Assignment 6 & Python WOW Proposal Due |
| **Due**Sunday, Mar 15Midnight | **Final Project**  | Python WOW Due |

**Grading**

Final grades in the class will be calculated as follows:

*Participation (30%)*

* If you are not present for Day 1, you will not be allowed to add the course. If you are enrolled and you do not attend Day 1 or complete the pre-work, you will be dropped from the course.
* If you add the course at the last minute, you are expected to complete the pre-work.
* Students are expected to actively participate in class by posting solutions to challenges on a Slack group (an online messaging tool) for the course.

*Assignments (20%)*

* There will be six homework assignments (one for each class).
* Each assignment should be completed individually.
* Late assignments will be accepted with a 20% penalty any time before the final class. No late assignments will be accepted after the final class.

*Final Project (50%)*

* There will be a take-home final project.
* The final project can be completed individually or with a partner (no groups of three allowed).