Online course learning objectives

Perfect for beginners, this course teaches the fundamentals of Python programming through taught materials and practical example.

By the end of the course, learners will:

- Develop skills with core elements of the Python programming language, and gain an appreciation of how these can feed into social scientific work (e.g., researching with digital data).
- See how to make methodologically appropriate decisions when designing and developing research where programming skills are deployed, including harvesting and organizing data.
- Understand how to approach a social science research question using Python, and have the capacity to devise a solution to such problems where programming skills can be deployed to reveal social scientific insight.

To reinforce these learning objectives we include a number of structured activities to follow on from the learning objectives.

**Language:** English  
**Time to complete:** 24 hours  
**Instructors:** Dr. Rob Mastrodomenico and Dr. Phillip Brooker

Online course full syllabus

**MODULE ONE: GETTING STARTED WITH PYTHON AND UNDERSTANDING THE BASICS**

- Why use Python? - Introduction to the course and a short explanation of the value of Python for data analysis and social science.  
  - Installing Python.  
  - Working in the shell and using an editor.  
  - Equality and comparison - difference between assignment and equality, using comparison operators.  
  - Assigning variables - assigning one or more variables, overwriting and modifying variables.

**MODULE TWO: DATA TYPES AND DATA CONTAINERS**

- Data types - the three different data types and operations that can be performed on them.  
  - Lists - creating and manipulating lists, list functions and mapping.  
  - String formatting - string use and manipulation in Python.  
  - Tuples - function and use of the tuple data container.  
  - Dictionaries - Function and use of dictionaries.
MODULE THREE: CONTROL STATEMENTS AND DEALING WITH FILES

- IF, ELSE and ELIF - what IF, ELSE and ELIF statements are and how to use them, e.g. using ELSE to handle when a condition is not met.
- Loops - constructing and using loops and IF statements to check conditions and change the behavior of a program.
- And/or - Using and/or conditions.
- Dealing with files - Opening, reading and closing files.

MODULE FOUR: WRITING SCRIPTS, FUNCTIONS, CLASSES AND WORKING IN THE WEB

- Working with the web - pulling data from web content.
- Writing functions - purpose and use of functions.
- Writing scripts in Python - splitting code into multiple scripts.
- Objects and Classes - creating a class and using objects.
- A brief guide to thinking like a programmer - considerations when planning tasks to do using code, task flow etc.