

# Introduction to Python

ICPSR Summer Program

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## Instructor

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## Course Time, Location, Office Hours:

TBA

## Course Description & Objectives

Python is one of the most popular programming languages in the world. Its rise in popularity has been fueled by its ease of use, readability, and its widespread adoption in fields such as machine learning and data science. Beside these, Python also has a large ecosystem that ranges from building web applications to task automation. This course balances a general introduction to Python fundamentals, such as built-in datatypes, object oriented programming, writing functions, with more specific applications that are useful for social scientists, such as web scraping, collecting data from APIs, interacting with databases, and performing data manipulation and analysis.

The course sessions will feature a blend of theory and practical application, with the instructor delivering lectures and guiding students through hands-on coding exercises during class.

Please find the course schedule outlined below. It is important to note that we may adjust the duration of certain topics or substitute them with others based on the interests and needs of the class.

## Course Schedule

Please find the topics for each day below.

Day	Topic
1	<ul style="list-style-type: none"><li>• What is Python and how to set up a Python environment</li><li>• fundamental data types: integers, floats, booleans, strings, and None</li><li>• Arithmetic and logical operators</li><li>• Variables and assignment operators</li></ul>
2	<ul style="list-style-type: none"><li>• conditional statements (if, else, elif) and loops (for and while)</li><li>• Lists, Tuples, Dictionaries and Sets</li><li>• Aliasing, mutability, cloning</li></ul>

3	<ul style="list-style-type: none"><li>● Defining and calling functions</li><li>● Object Oriented Programming (OOP)</li><li>● Importing and using modules</li></ul>
4	<ul style="list-style-type: none"><li>● HTTP requests with the <i>requests</i> library</li><li>● Interacting with APIs<ul style="list-style-type: none"><li>○ Parsing JSON files</li></ul></li><li>● Scraping web pages<ul style="list-style-type: none"><li>○ Working with HTML files using the <i>BeautifulSoup</i> library</li></ul></li></ul>
5	<ul style="list-style-type: none"><li>● Dataframes and data manipulation (using <i>pandas</i>)</li><li>● Interacting with databases (using <i>sqlite3</i>)</li></ul>

### Material:

Everything you need to know for the course will be presented during the lectures. We do not have an official textbook. Here is some useful material for Python basics and beyond for reference:

Books:

[McKinney, W. \(2022\). \*Python for Data Analysis\*. O'Reilly Media, Inc](#)

YouTube:

[Corey Schafer YouTube channel](#)

Official Documentations:

- [Python Standard Library Documentation](#)
- [Pandas User Guide](#)
- [Requests Documentation](#)
- [BeautifulSoup Documentation](#)