

# Python for Data Science Bootcamp

Unlock the power of Python for data-driven decision-making as you master Python programming fundamentals and dive into data analysis. Acquire essential skills to clean and manipulate data, create insightful visualizations, and perform statistical analysis, all through hands-on projects with real-world datasets.

Group classes in Live Online and onsite training is available for this course. For more information, email [onsite@graduateschool.edu](mailto:onsite@graduateschool.edu) or visit: <https://www.graduateschool.edu/courses/python-data-science-bootcamp-nyc>



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## Course Outline

### Python Fundamentals

#### Python Fundamentals: Variables & Data Types

- Declare variables of basic types: integers, floats, strings, booleans
- Perform input/output with `print()` and `input()`
- Apply arithmetic, relational, and logical operators

#### Control Flow I: Conditional Logic

- Use Boolean operators `==`, `!=`, `<`, `>`, `<=`, `>=`
- Write `if/else` and nested conditionals
- Combine conditions with `and/or` for complex logic

#### Control Flow II: Loops & Iteration

- Implement `for` loops over ranges and lists; understand iterables
- Understand `map` and `filter` operations.
- Use list comprehensions to simplify operations.

#### DataFrames & Data Manipulation with Pandas

- Construct DataFrames from various data formats via `pd.DataFrame()`
- Concatenate multiple DataFrames using `pd.concat()`
- Inspect DataFrame shape and handle missing values (NaN)
- Perform Panda data analysis operations to glean insight

#### Data Visualization: Charting Basics

- Plot time series with `plt.plot()` for line charts
- Create scatter plots using `plt.scatter()` to reveal correlations

- Decide between line vs. scatter based on data context and purpose

### **Trend Analysis with Regression Lines**

- Understand least-squares regression concept and its interpretation
- Compute a best-fit line via `numpy.polyfit()`
- Overlay regression lines on scatter plots and make predictions

### **Advanced Plot Customization**

- Annotate charts with titles, axis labels, and legends
- Highlight key data points (e.g., min/max) directly on plots
- Use stacked bar charts, pie charts, and animated charts to visualize data