

Advanced Python Training

Applied Technology Academy

This course will help you gain an understanding of Python's capabilities beyond basic syntax with a focus on widely accepted Pythonic constructs and procedures that will enable you to write reliable, optimized, and modular applications. This very hands-on course includes a deep dive into Pythonic data structures, exception handling, meta programming, regular expression, advanced file-handling, asynchronous programming, and more. At the completion of the course, you will also gain an understanding of unit testing in Python with lab-based practices designed to help you create and run unit test cases.

LEVEL	DURATION	EXPERIENCE	AVERAGE SALARY	LABS
Intermediate	5 Days	1 year: Programming	\$118,400	Yes

Course Overview

This course has 50% hands-on labs to 50% lecture ratio with engaging instruction, demos, group discussions, labs, and project work in which you'll learn:

- Enhancements to classes
- Advanced Python metaprogramming concepts
- Writing robust code using exception handling
- Working with different data structures supported in Python
- Search and replace text with regular expressions
- Easy-to-use and easy-to-maintain modules and packages
- Creating multithreaded and multi-process applications
- Implementing and execute unit tests

Course Outline

- **Lesson 1**
 - Python refresher Built-in data types
 - Lists and tuples
 - Dictionaries and sets
 - Program structure
 - Files and console I/O
 - If statement for and while loops
 - Data Structures and Algorithms
 - Linked list
 - Stack

- Queue
- Trees
- Graphs
- Sorting algorithms

- **Lesson 2**

- Errors and Exception Handling
- Syntax errors
- Exceptions
- Using try/catch/else/finally
- Handling multiple exceptions
- Ignoring exceptions
- Implementing Regular Expressions
- RE Objects
- Searching and matching
- Using Regular Expression to search data sets
- Searching for data in Wireshark Traces (Python and *.pcaps)
- Compilation flags
- Groups and special groups
- Replacing text
- Splitting strings
- Advanced Functional Features of Python
- Advanced unpacking
- List Comprehension
- Anonymous functions
- Lambda expressions
- Generator Expression
- Decorator
- Closure
- Single/multi dispatch

- **Lesson 3**

- Metaprogramming
- OOP conventions
- Class/static data and methods
- Parse information to create classes using a dictionary
- Super() method
- Metaclasses
- Abstract base classes

- Implementing protocols (context, iterator, etc.) with special methods
- Implicit properties
- Globals() and locals()
- Working with object attributes
- The inspect module
- Callable classes
- Monkey patching
- Metaprogramming
- Paths, directories, and filenames
- Checking for existence
- Permissions and other file attributes
- Walking directory trees
- Creating filters with file input
- Using Shutil for file operations
- OOP conventions

- **Lesson 4**

- Advanced Data Structure features in Python
- Use defaultdict, Counter, and namedtuple
- Create data classes
- Store data offline with pickle
- Pretty printing data structures
- Compressed archives (zip, gzip, tar, etc.)
- Persistent data
- Multiprogramming
- Concurrent programming
- Multithreading
- The threading module
- Sharing variables
- The queue module
- The multiprocessing module

- **Lesson 5**

- Developer Tools
- Analyzing programs with pylint
- Using the debugger
- Profiling code
- Testing speed with benchmarking
- Networking

- Using the socket library
- Creating a TCP/IP client and server
- Creating a UDP client and server
- Using the HTTP library
- Sending email with smtplib
- Web Scraping and Data Processing
- Using BeautifulSoup
- Using Selenium
- Processing XML
- Processing JSON
- Using pandas for CSV files

Intended Audience

This course is designed for students with Python programming literacy who want to learn about advanced Python features and how to automate and simplify tasks.

Prerequisites

Recommended Prerequisite: Python Basics (5 days) Coding experience in another language serves as an adequate prerequisite

System administrators, network engineers, and developers will find this course compelling as they build and interact APIs that not only return highly parsable datasets, but also trigger scripted actions. Some previous experience with Python is ideal, although, coding experience in another language is also enough to find success within this course.

Follow-On Courses

- Python for Network Automation
- Python for Reverse Engineers
- Threat Hunting with Python
- Python for Data Sciences

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