



## Advanced Python Engineering

- 3 Day Course
- Lecture & Labs

### Course Overview

This course is designed for experienced Python users who want to move beyond foundational scripting and begin building more structured, scalable applications. Over two days, participants will strengthen their approach to object-oriented design, work with real-world data sources, and learn how to integrate Python with external systems through APIs and web services.

The course emphasizes practical development skills, including testing, data processing, and application workflows. Participants will also be introduced to lightweight web development using Flask, giving them the ability to create and interact with simple web applications. By the end of the course, students will be better equipped to write maintainable code, automate data-driven tasks, and extend Python into modern application environments.

Review this course online at <https://www.alta3.com/courses/pyadv>

### Who Should Attend

- Python Developers
- DevSecOps Engineers

### What You'll Learn

- Advanced OOP mastery
- Excel, XML, and CSV processing
- Decorator and generator implementation
- HTTP and REST API integration
- Flask and Jinja2 web development
- Unit testing and code mocking

### Outline

#### Day 1 - Python OOP Foundation & Working with Data

- Lecture + Lab: Objects and Methods
- Lecture + Lab: Creating Classes
- Lecture + Lab: Object Creation Process and Properties
- Lecture + Lab: Class and Static methods
- Lecture + Lab: Magic methods and Overloading Addition
- Lecture + Lab: Inheritance
- Lecture + Lab: super: Delegating Method Calls to a Parent or Sibling Class
- Lecture + Lab: Abstract Class
- Lecture + Lab: Python Unit Testing
- Lecture + Lab: Pandas dataframes with Excel, csv, json, HTML and beyond

## Day 2 - Advanced Python, HTTP, and Web App Development

- Lecture + Lab: Advanced constructs: Decorators and Generators
- Lecture: Introduction to HTTP
- Lecture: HTTP GET vs HTTP POST
- Lecture + Lab: More HTTP Actions – PUT, HEAD, DELETE
- Lecture + Lab: requests library - Open APIs
- Lecture + Lab: Web Scraping Data with BeautifulSoup
- Lecture + Lab: requests library - GET vs POST to REST APIs
- Lecture + Lab: Tracking API Data with sqlite3
- Lecture: Intro to Flask
- Lecture + Lab: Flask Dispatching, Routing and Responses
- Lecture: Introduction to Jinja
- Lecture + Lab: Flask APIs and Jinja2

### Time Permitting Topics

- Lecture + Lab: Building APIs with Python
- Lecture + Lab: Mocking data for testing
- Lecture + Lab: Container Classes and Additional data structures

### Prerequisites

- Keyboard proficiency
- Students should have basic Python proficiency