

# Python® Programming: Advanced

## Course Specifications

### Course Number:

094012

### Course Length:

3 days

## Course Description

### Overview:

Python® continues to be a popular programming language, perhaps owing to its ability to get a lot of work done in few lines of code, and its versatility. Python is useful for developing custom software tools, applications, web services, and cloud applications. In this course, you'll build upon your basic Python skills, learning more advanced topics such as object-oriented programming patterns, development of graphical user interfaces, data management, threading, unit testing, and creating and installing packages and executable applications.

### Course Objectives:

In this course, you will expand your Python proficiencies.

You will:

- Create object-oriented Python applications.
- Design and create a GUI.
- Store data in a database from Python applications.
- Communicate using client/server network protocols.
- Manage multiple processes with threading.
- Implement unit testing.
- Package an application for distribution.

### Target Student:

This course is designed for existing Python programmers who have at least one year of Python experience and who want to expand their Python proficiencies.

### Prerequisites:

To ensure your success in this course, you should have experience with object-oriented programming and Python 2.x or 3.x. You can obtain this level of skill and knowledge by taking the following Logical Operations course:

- *Python® Programming: Introduction*

## Course-specific Technical Requirements

### Hardware

For this course, you will need one computer for each student and one for the instructor. Each computer will need the following minimum hardware configurations:

- 1 GHz or faster 32-bit (x86) or 64-bit (x64) processor
- 2 gigabytes (GB) RAM (32-bit or 64-bit)
- 20 GB available hard disk space (32-bit or 64-bit)
- Keyboard and mouse (or other pointing device)
- 1,024 x 768 resolution monitor recommended
- Projection system to display the instructor's computer screen
- Local area network and Internet connection recommended

### Software

- Windows® 10/8.1/8/7/Vista (64-bit).  
NOTE: This course was successfully keyed on Windows 10. Some activity steps may not key exactly as written if students key on a different version of Windows.
- Python version 3.4.2 (**python-3.4.2.amd64.msi**, provided with the course data files).
- PyCharm Community Edition version 3.4.1 (**pycharm-community-3.4.1.exe**, provided with the course data files).  
NOTE: Python is distributed under the Python Software Foundation License (PSFL). PyCharm Community Edition is distributed under the Apache® License 2.0.
- If necessary, software for viewing the course slides. (Instructor machine only.)

## Course Content

### Lesson 1: Using Object-Oriented Python

**Topic A:** Create and Use Classes in an Application

**Topic B:** Use Magic Methods

**Topic C:** Incorporate Class Factories

## **Lesson 2: Creating a GUI**

**Topic A:** Design a GUI

**Topic B:** Create and Arrange a GUI Layout

**Topic C:** Interact with User Events

## **Lesson 3: Using Databases**

**Topic A:** Basics of Data Management

**Topic B:** Use SQLite Databases

**Topic C:** Manipulate SQL Data

## **Lesson 4: Network Programming**

**Topic A:** Basics of Network Programming

**Topic B:** Create a Client/Server Program

## **Lesson 5: Managing Multiple Processes with Threading**

**Topic A:** Create a Threaded Application

**Topic B:** Manage Thread Resources

## **Lesson 6: Implementing Unit Testing**

**Topic A:** Test-Driven Development

**Topic B:** Write and Run a Unit Test Case

**Topic C:** Create a Test Suite

## **Lesson 7: Packaging an Application for Distribution**

**Topic A:** Create a Package Structure

**Topic B:** Generate the Package Distribution Files

**Topic C:** Generate a Windows Executable