

# Python for Data Science Boot Camp: Essential Techniques and Applications - **TTPS4876**

Gain advanced skills to handle complex data sets, understand machine learning algorithms, and translate data into actionable insights

**Duration:** 5 Days

**Skill Level:** Intermediate

**Available Format:** Instructor-Led Online; Instructor-Led, Onsite In Person ; Blended; On Public Schedule

Geared for experienced Python users with basic data science skills, **Next Level Python for Data Science** is a comprehensive hands-on course that deep dives the advanced skills and tools used to perform exploratory data analysis, create complex visualizations, and perform large-scale distributed processing on Big Data.

## What You'll Learn

### Overview

**Next-Level (Intermediate) Python for Data Science and /or Machine Learning** is a five-day hands-on course designed for Python enthusiasts looking to expand their data science and machine learning skills. Whether you're already familiar with Python basics or have dabbled in some coding, this course will take you further, focusing on practical applications of popular libraries like pandas, NumPy, and Scikit-Learn. By the end, you'll be ready to tackle intermediate data science tasks with confidence.

**You'll start by** diving deep into pandas, exploring its powerful DataFrame and Series structures to clean, filter, and manipulate data with ease. Then, you'll shift gears into the world of NumPy, learning to perform efficient numerical computations, a crucial skill for any data scientist. The course also introduces you to text data processing and teaches you how to visualize your results with Matplotlib, making your data easy to understand and present.

**In the final stretch**, you'll get hands-on with machine learning using Scikit-Learn. You'll learn to build simple models, train them on data, and evaluate their performance, giving you a solid foundation in the machine learning workflow. This course offers a comprehensive and approachable way to level up your Python skills and apply them to real-world data science problems.

## Objectives

This course combines engaging instructor-led presentations and useful demonstrations with valuable hands-on labs and engaging group activities. Throughout the course you will explore:

- **Mastering pandas Operations:** Learn to navigate, manipulate, and explore data using pandas DataFrames and Series, improving your ability to handle diverse datasets.
- **Enhancing Numerical Computation with NumPy:** Gain proficiency in performing efficient numerical operations using NumPy arrays, essential for data-driven calculations.
- **Working with Series Data in pandas:** Understand how to create, manipulate, and apply methods to pandas Series for effective data slicing and mathematical operations.
- **Filtering and Exploring DataFrames:** Develop the ability to filter, conditionally select, and efficiently explore data within pandas DataFrames, even when working with large datasets.
- **Processing and Analyzing Text Data:** Learn to handle, clean, and analyze text data using pandas, preparing it for visualization or machine learning applications.
- **Applying Machine Learning with Scikit-Learn:** Build, evaluate, and apply simple machine learning models using Scikit-Learn to address basic predictive tasks and gain insights from data.

If your team requires different topics, additional skills or a custom approach, our team will collaborate with you to adjust the course to focus on your specific learning objectives and goals.

## Audience

This course is geared for experienced data analysts, developers, engineers or anyone tasked with utilizing Python for data analytics or eventual machine learning tasks. **Attending students are required to have a background in basic Python for data science.**

## Pre-Requisites

**Attending students are required to have a background in basic Python for data science.**

**Take Before:** Students should have incoming practical skills aligned with those in the course(s) below, or should have attended the following course(s) as a pre-requisite:

- **TTPS4873** Fast Track to Python for Data Science and Machine Learning (3 days)
- **TTPS4874** Applied Python for Data Science & Engineering (4 days)

TTPS4820	Mastering Python Programming Boot Camp
TTPS4824	Python Essentials for Networking & Systems Administration
TTPS4873	Fast Track to Python for Data Science and/or Machine Learning
TTPS4874	Applied Python for Data Science and Engineering
TTPS4883	Forecasting, Behavioral Analysis, and What-If Scenarios with Python

## Agenda

*Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.*

### MODULE 1: Getting Started

- 1. Introduction to pandas**
  - Overview of pandas library
  - Installation and setup
  - Understanding the importance of pandas in data science
- 2. A Whirlwind Tour of pandas**
  - Exploring basic operations in pandas
  - Introduction to DataFrames and Series
  - Overview of essential pandas functionalities

### MODULE 2: The Python Ecosystem

### **3. Python Crash Course**

- Python basics: Variables, data types, and control flow
- Functions and modules in Python
- Introduction to object-oriented programming in Python

### **4. NumPy Crash Course**

- **Understanding NumPy arrays**
- **Basic operations with NumPy**
- **Utilizing NumPy for numerical computing**

## **MODULE 3: The Series**

### **5. The Series Object**

- Introduction to pandas Series
- Creating and manipulating Series objects
- Understanding indexing and slicing in Series

### **6. Series Methods**

- Applying methods on Series
- Handling missing data in Series
- Performing mathematical operations on Series

## **MODULE 4: The DataFrame**

### **7. The DataFrame Object**

- Understanding the structure of DataFrames
- Creating DataFrames from various data sources
- Exploring data in DataFrames

### **8. Filtering a DataFrame**

- Techniques for filtering data in DataFrames
- Applying conditions to DataFrames
- Handling large datasets with efficient filtering

## **MODULE 5: Working with Text Data**

### **9. Working with Text Data**

- Introduction to text data in pandas

- String operations and methods in pandas
- Handling and cleaning text data

## **MODULE 6: Working with AI and Visuals**

### **10. Working with Matplotlib and PIL**

- Basics of Matplotlib for data visualization
- Creating plots and charts
- Introduction to the Python Imaging Library (PIL) for image processing

### **11. Machine Learning with Scikit-Learn**

- Introduction to machine learning concepts
- Applying Scikit-Learn for basic machine learning tasks
- Building and evaluating simple machine learning models

## **Follow On Courses**

TTAI2360	Applied AI: Building Recommendation Systems with Python
TTAI2361	Applied AI : Quick Start to Building AI-Driven, Intelligent Web Applications
TTML5506-P	Machine Learning Essentials with Python
TTPS4879	Hands-On Predictive Analytics with Python

## **Related Courses**

TTPS4879	Hands-On Predictive Analytics with Python
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All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels, CodeCoach.AI anytime tutor access, and rich extended learning and post training resources are provided for you in our “easy access, single source, no install required” online **Learning Experience Platform (LXP)**, remote lab and content environment. Access periods vary by course. We’ll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

## For More Information

Please [contact us](#) or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.