6-Month Advanced Level Python Programming Training

Certification Course Outline

Module 1: Python Refresher

- First, review variables, data types, and basic operators.
- Next, practice loops and conditionals in small examples.
- Then, revise functions and return statements clearly.
- Finally, solve mini problems to strengthen core Python skills.

Module 2: Advanced Functions

- First, learn lambda functions for quick operations.
- Next, use map, filter, and reduce effectively.
- Then, explore recursion with practical examples.
- Finally, practice passing functions as arguments.

Module 3: Data Structures

- First, explore lists, tuples, and sets in detail.
- Next, work with dictionaries for key-value storage.
- Then, learn nested data structures usage.
- Finally, solve exercises combining multiple structures.

Module 4: Object-Oriented Programming (OOP)

- First, understand classes and objects.
- Next, learn attributes, methods, and constructors.
- Then, explore inheritance and polymorphism.
- Finally, create small class-based projects.

Module 5: File Handling

- First, open, read, and write files in Python.
- Next, handle CSV and JSON data formats.
- Then, explore file modes and context managers.
- Finally, build mini projects with file I/O.

Module 6: Modules & Packages

- First, learn to import built-in Python modules.
- Next, explore third-party libraries with pip.
- Then, organize code into reusable packages.
- Finally, practice using multiple modules together.

Module 7: Error Handling

- First, understand exceptions and error types.
- Next, use try, except, and finally blocks.
- Then, raise custom exceptions when needed.
- Finally, handle multiple exceptions in practice.

Module 8: Advanced Libraries – NumPy & Pandas

- First, use NumPy for fast numerical operations.
- Next, explore arrays, matrices, and calculations.
- Then, learn Pandas for data analysis.
- Finally, manipulate datasets with real examples.

Module 9: Data Visualization

- First, explore Matplotlib for graphs and charts.
- Next, use Seaborn for advanced visualization.
- Then, customize plots with labels, colors, and styles.
- Finally, create reports with multiple charts.

Module 10: Web Scraping & APIs

- First, use BeautifulSoup for extracting web data.
- Next, fetch data from APIs using requests.
- Then, parse JSON and XML responses.
- Finally, store scraped data in files or databases.

Module 11: Automation & Projects

- First, write scripts to automate daily tasks.
- Next, use Python to interact with Excel, emails, and files.
- Then, build small end-to-end projects.
- Finally, debug and optimize code for efficiency.

Module 12: Certification & Advanced Practice

- First, revise all modules and tools learned.
- Next, complete a capstone project with multiple libraries.
- Then, submit your project for evaluation.
- Finally, earn your **Advanced Python Certificate** and plan future projects.