



TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

Professional Python Programming Course Outline

Module 1: Introduction to Python Programming

- Overview of Python & Its Applications
- Installing Python & Setting Up the Development Environment (VS Code, PyCharm, Jupyter)
- Understanding Python Syntax & Code Structure
- Running Python Scripts & Interactive Mode

Module 2: Python Basics & Core Concepts

- Variables, Data Types, and Operators
- Conditional Statements & Loops (if-else, for, while)
- Functions & Modular Programming
- Exception Handling & Debugging

Module 3: Data Structures in Python

- Lists, Tuples, Dictionaries & Sets
- List Comprehensions & Lambda Functions
- Working with Strings & String Manipulation
- Understanding Mutable vs. Immutable Data Types

Module 4: Object-Oriented Programming (OOP) in Python

- Classes & Objects
- Inheritance, Polymorphism & Encapsulation
- Magic Methods & Dunder Methods
- Designing Modular & Scalable Applications

Module 5: File Handling & Data Processing

- Reading & Writing Files (TXT, CSV, JSON, XML)
- Working with Directories & File Operations
- Handling Large Data Files Efficiently
- Automating File Processing Tasks

Module 6: Python Libraries & Frameworks

- Introduction to Python Standard Library
- NumPy & Pandas for Data Analysis
- Matplotlib & Seaborn for Data Visualization
- Using Requests & BeautifulSoup for Web Scraping

Module 7: Database Handling & SQL with Python

- Connecting Python to MySQL, PostgreSQL & SQLite
- Performing CRUD Operations in Databases
- Using ORM (SQLAlchemy) for Database Management
- NoSQL Databases (MongoDB) with Python

Module 8: Web Development with Python (Flask & Django)

- Introduction to Flask & Django Frameworks
- Creating Web Applications with Flask
- Building RESTful APIs with Django REST Framework
- Deploying Python Web Applications

Module 9: Data Science & Machine Learning with Python

- Introduction to Data Science with Python
- Data Cleaning & Preprocessing with Pandas
- Building Machine Learning Models with Scikit-Learn
- Deep Learning Basics with TensorFlow & PyTorch

Module 10: Automation & Scripting with Python

- Automating Repetitive Tasks with Python
- Working with Selenium for Web Automation
- Sending Emails & Notifications with Python
- Automating Excel Reports with OpenPyXL

Module 11: Cybersecurity & Ethical Hacking with Python

- Network Programming & Socket Programming
- Using Python for Ethical Hacking & Penetration Testing
- Automating Security Testing with Python Scripts
- Cryptography & Encryption Techniques

Module 12: Advanced Python Topics

- Multithreading & Parallel Processing
- Performance Optimization & Code Efficiency
- Python for IoT & Embedded Systems
- Cloud Computing with Python (AWS, Azure, GCP)

Module 13: Python for AI & Robotics

- Natural Language Processing (NLP) with Python
- Image Processing with OpenCV
- Building Chatbots with Python & AI
- Robotics & IoT Integration with Python

Module 14: Final Project & Certification Preparation

- Developing a Complete Python Application
- Hands-on Real-World Case Studies & Capstone Projects
- Preparing for Python Certification (PCAP, PCEP, Microsoft Python Certification)
- Career Paths & Job Opportunities in Python Development