

Python Fundamentals - Intermediate Course

Duration: 6 Weeks

Mode: Online/Physical

Prerequisites: Basic Python knowledge (variables, loops, conditionals, functions)

Week 1: Advanced Data Structures

- Lists (slicing, comprehension, methods)
- Tuples (immutability, packing/unpacking)
- Dictionaries (methods, dictionary comprehensions)
- Sets (operations, set comprehensions)

Week 2: Object-Oriented Programming (OOP) Basics

- Classes and Objects
- Instance and Class Variables
- Methods (Instance, Class, and Static Methods)
- Encapsulation, Inheritance, and Polymorphism

Week 3: File Handling and Exception Handling

- Reading/Writing Files (text and CSV)
- Working with JSON files
- Exception Handling (try, except, finally)
- Raising and Customizing Exceptions

Week 4: Modules, Packages, and Virtual Environments

- Importing Modules and Creating Custom Modules
- Using Standard Libraries (datetime, random, os, sys)
- Virtual Environments and Dependency Management (pip, venv)
- Installing and Managing Third-Party Libraries

Week 5: Working with APIs and Databases

- Fetching Data from APIs (requests, JSON)
- Introduction to SQL and SQLite with Python
- CRUD Operations with SQLite
- Working with Pandas for Data Analysis

Week 6: Multi-Threading, Debugging, and Final Project

- Understanding Multi-threading and Multiprocessing
- Debugging with `pdb` and Logging

- Code Optimization and Best Practices
- **Final Project:** Build a mini-project using learned concepts (e.g., a CLI tool, API-based app, or a database-driven project)