



Advanced Python Syllabus

1. Advanced Data Types & Collections

- Advanced List Operations
- Collections Module (Counter, defaultdict, namedtuple, deque)
- Itertools and Functools

2. Advanced Functions

- Lambda Functions
- Map, Filter, Reduce
- Closures and Decorators
- Generators and Iterators

3. Object-Oriented Programming (OOP)

- Advanced Inheritance (Multiple, Multilevel, MRO)
- Abstract Classes and Interfaces (abc module)
- Magic/Dunder Methods
- Encapsulation and Polymorphism

4. Modules and Packages

- Creating and Importing Custom Modules
- Python Package Structure
- Virtual Environments (venv, pipenv)

5. File Handling & Serialization

- Advanced File Operations
- Working with JSON, CSV, and XML
- Pickle and Shelve Modules

6. Error & Exception Handling

- Custom Exceptions
- Logging and Debugging Techniques
- Context Managers (with statement)

7. Multithreading & Multiprocessing

- Threading Module
- Multiprocessing Module
- Concurrency and Parallelism
- AsyncIO Programming

8. Database Connectivity

- SQLite with Python
- MySQL/PostgreSQL Integration



- ORM (SQLAlchemy basics)

9. Testing in Python

- Unit Testing with unittest & pytest
- Test Fixtures and Mocking
- CI/CD Basics for Testing

10. Web Development Basics

- Flask/Django Introduction
- REST API Basics with Flask
- Request Handling & JSON APIs

11. Advanced Libraries

- NumPy (Advanced Functions)
- Pandas (Data Cleaning, Merging, Grouping)
- Matplotlib & Seaborn (Advanced Visualization)

12. Project

- End-to-End Python Project
- Integrating OOP, File Handling, Database, and APIs