

# Python Development with GitHub Copilot

**Course Duration: 16 hours**

## Day 1: GitHub Copilot & Python Essentials (8 Hours)

### Module 1: Introduction to GitHub Copilot

- What is GitHub Copilot?
- Plans, Pricing, and Setup
- How Copilot Works (under the hood)
- Productivity Path & Best Practices

 **Lab 1:** Install and configure GitHub Copilot in VS Code / IDE.

- Write your first Copilot-assisted Python snippet.
- 

### Module 2: Python Refresher with Copilot

- Variables, Datatypes, and Strings
- Console I/O with Copilot
- Print Formatting & Pretty Printing JSON/YAML
- Common mistakes and how Copilot fixes them

 **Lab 2:**

- Use Copilot to generate examples of string manipulation.
  - Task: Build a JSON formatter using Copilot.
- 

### Module 3: Python Data Structures Made Easy

- Lists: Create, Add, Remove, Slice
- Dictionaries: Create, Update, Access
- Sets & List Comprehensions

 **Lab 3:**

- Use Copilot to generate a **student record manager** (list/dict based).
  - Extend it with list comprehensions and filtering.
- 

### Module 4: Writing & Reviewing Code with Copilot

- Control Structures (if/else, loops)
- Functions (definition, sorting, quicksort)
- Refactoring functions using Copilot
- Code Reviews with Copilot suggestions

#### Lab 4:

- Refactor an existing function using Copilot's recommendations.
  - Task: Rewrite a sorting function into multiple clean methods.
- 

## Day 2: Advanced Copilot Usage & Project Development (8 Hours)

### Module 5: Object-Oriented Programming with Copilot

- Classes & Objects
- Inheritance and method overriding
- Copilot-assisted UML diagramming (PlantUML basics)

#### Lab 5:

- Create a **Book Library system** using classes.
- 

### Module 6: File Handling & Modules

- Working with text & JSON files
- Error handling in file operations
- Creating and reusing modules

#### Lab 6:

- Build a **log parser** that reads/writes files.
  - Enhance with Copilot to store logs in JSON format.
- 

### Module 7: Testing with Copilot

- Introduction to Unit Testing (Unittest, Pytest)
- Writing basic test cases with Copilot
- Fixtures, parametrization, doctest

#### Lab 7:

- Write **test cases for the Book Library system**.
  - Extend tests with parametrization using Copilot.
- 

### Module 8: REST API Development with Copilot

- REST API basics & HTTP methods
- FastAPI Hello World with Copilot
- CRUD Operations with a mock database
- Authentication using JWT