Intermediate Python Programming

Course Duration: 3 Days

Course Objectives:

- To deepen participants' understanding of Python programming concepts.
- To provide in-depth knowledge of Object-Oriented Programming (OOP).
- To introduce networking and multithreading in Python.

Software Setup:

- Participants should have Python 3.x installed on their laptops.
- PyCharm Integrated Development Environment (IDE).

Day 1: Foundations of Intermediate Python Programming

Session 1: Review of Python Basics

Module 1: Python Basics

- Recap of variables, data types, and basic operations.
- Control flow: if statements, loops (for and while).
- Functions and their importance.

Module 2: Working with Data Structures

- Lists, tuples, and dictionaries.
- List comprehensions.
- Iterating through data structures.

Session 2: File Handling and Modules

Module 3: File Handling

- Reading and writing files.
- CSV and JSON handling.
- Error handling with try...except.

Module 4: Functions and Modules

- Defining and using functions.
- Creating and importing modules.
- Best practices for function design.

Day 2: Object-Oriented Programming in Python

Session 1: Introduction to OOP

Module 5: Introduction to OOP

- Understanding classes and objects.

- Constructors and destructors.
- Class attributes and methods.

Module 6: Inheritance and Polymorphism

- Creating and using subclasses.
- Method overriding and method overloading.
- Achieving polymorphism in Python.

Session 2: Encapsulation and Data Abstraction

Module 7: Encapsulation and Data Abstraction

- Encapsulation principles in Python.
- Data hiding.
- Abstract classes and interfaces.

Day 3: Additional Topics in Python

Session 1: Networking in Python

Module 8: Networking in Python

- Introduction to network protocols (TCP, UDP).
- Socket programming in Python.
- Creating client-server applications.

Session 2: Multithreading in Python

Module 9: Multithreading in Python

- Understanding threads and concurrency.
- Creating and managing threads.
- Thread synchronization and communication.