Python Programming

Course Content

1. Introduction to Python

- What is Python?
- Features & advantages of Python
- Applications of Python (Web, Data, AI, Automation)
- Python vs other programming languages
- Installing Python & IDE setup
- Writing your first Python program

2. Python Basics

- Variables & data types
- Type casting
- Input & output
- Operators
- Control statements (if, elif, else)
- Loops (for, while)
- Hands-on:
- Write basic Python programs

3. Functions & Modules

- Defining & calling functions
- Function arguments & return values
- Lambda functions
- Built-in functions
- Modules & packages
- Hands-on:
- Create reusable functions

4. Data Structures in Python

- Lists, Tuples, Sets & Dictionaries
- Operations on data structures
- List comprehension
- Nested data structures

- Hands-on:
- Solve problems using data structures

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5. Object-Oriented Programming in Python

- Classes & Objects
- Constructors
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction
- Hands-on:
- OOP-based mini program

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6. File Handling & Exception Handling

- Reading & writing files
- Working with CSV & text files
- Exception handling (try, except, finally)
- Custom exceptions
- Hands-on:
- File processing program

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7. Introduction to Libraries & Tools

- NumPy basics
- Pandas overview
- Matplotlib introduction
- Working with external libraries
- Package management using pip
- Hands-on:
- Data analysis & visualization demo

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8. Python Mini Project

- End-to-end Python application
- Example projects:
- Student Management System
- Automation script
- Data analysis mini project
- Project explanation & execution

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9. Career Guidance & Wrap-Up

● Python career roadmap
● Skills required for jobs & internships
● Python roles (Developer, Data Analyst, AI Engineer)
● Project discussion & Q&A

Workshop Outcomes

● Strong foundation in Python programming
● Hands-on coding experience
● Ability to write clean & efficient Python code
● Understanding of real-world Python applications
● Confidence to move into advanced domains like AI, ML & Data Analytics