Imagine a tool that's powerful enough to drive artificial intelligence, easy enough to create websites, flexible enough to analyze data, and handy for scientific research—all while being beginner-friendly! That’s **Python**.

**Total Duration:** approx**. 30 Hours - Theory + Coding ( Practical )**

**That includes:**

* 10+ Basic Projects
* 3 Portfolio Projects
* Career Guidance

*print("Welcome to Python ! Your journey into code begins here.")*

**Course Outline**

**1. Introduction to Python Programming (2 hours)**

**Theory (1.5 hours)**

* Overview of Python and its applications
* Setting up the environment (Anaconda, Jupyter Notebooks, VSCode)
* Python Syntax, Variables, and Data Types

**Coding (0.5 hours)**

**2. Control Structures and Functions (3 hours)**

**Theory (1.5 hours)**

* Conditional statements: if, else, elif
* Loops: for, while, and control keywords (break, continue)
* Functions: Defining, calling, return values, lambda functions
* Scope and Lifetime of Variables

**Coding (1.5 hours)**

**3. Data Structures (3 hours)**

**Theory (2 hours)**

* Lists, Tuples, Sets, Dictionaries
* List and dictionary comprehensions
* Basic operations and methods for each data structure
* Common use cases in data manipulation

**Coding (1 hour)**

**4. Object-oriented Programming (OOP) (4 hours)**

**Theory (3 hours)**

* Classes and Objects
* Constructors, Destructors, and self keyword
* Inheritance, Polymorphism, Encapsulation, and Abstraction
* SOLID Principles

**Coding (1 hour)**

**5. Error Handling and Debugging (2 hours)**

**Theory (1.5 hours)**

* Types of errors in Python
* Exception handling: try, except, else, finally
* Debugging techniques and using logging

**Coding (0.5 hours)**

**6. File Handling (2 hours)**

**Theory (1.5 hours)**

* Reading and writing files (open, read, write, close)
* Working with JSON and CSV files, etc
* Context managers and ‘with’ statements

**Coding (0.5 hours)**

**7. Introduction to Modules and Libraries (3 hours)**

**Theory (2 hours)**

* Standard libraries (math, datetime, os, etc.)
* Third-party libraries (overview of numpy, pandas, matplotlib)
* Creating and importing custom modules

**Coding (1 hour)**

**8. Data Science and Visualization Basics (4 hours)**

**Theory (3 hours)**

* Introduction to Data Science with Python
* Using pandas for data manipulation
* Visualization techniques with Matplotlib and Seaborn

**Coding (1 hour)**

**9. Introduction to Machine Learning (3 hours)**

**Theory (2 hours)**

* Overview of machine learning applications and trends
* Introduction to scikit-learn and machine learning workflow
* Simple ML algorithms (e.g., linear regression, decision trees)

**Coding (1 hour)**

**10. Advanced Python Concepts and Practices (2 hours)**

**Theory and Review (1 hour)**

* Decorators and Generators
* Advanced Data Structures (Stacks, queues, linked lists, and their use cases.)
* Multithreading and Multiprocessing

**Coding (1 hour)**

**Prepared by: Sujan Sharma ( ML Engineer )**