Python Course Modules

Course Overview

This course takes students from **Beginner to Advanced Python Programming**, with hands-on practice and real-world projects. It is designed to build strong programming skills that can be applied in **software development, automation, data science, and machine learning**.

Course Details

- **Duration:** 18 Weeks (4 - 4.5 Months)
- **Schedule:** 5 Days per Week (Monday to Friday or Availability days)
- **Total Sessions:** 90 Sessions
- **Session Duration:** ~1.5 Hours (per session)
- **Mode of Learning:** Online (Live Interactive Sessions)
- **Daily Fee:** ₹200 per session
- **Total Course Fee:** ₹18,000 per student

Module 1: Setup & Environment

- Python Installation & Setup
- VS Code Setup
- Virtual Environments (venv & conda)
- Git & GitHub Basics
- Hello World & First Python Program
- pip & Package Management

Module 2: Python Basics

- Syntax & Code Structure
- Comments & Docstrings
- Variables & Data Types
- Type Casting
- Input/output
- Operators (Arithmetic, Comparison, Logical, Bitwise)
- Conditional Statements (if, elif, else)
- Loops (for, while, nested loops)
- Functions (definition, parameters, return, scope)

Module 3: Data Structures

- Strings (basic + methods)
- Lists, Tuples, Sets, Dictionaries
- Nested Data Structures
- List & Dictionary Comprehensions
- Matrix & 2D List Examples
- Practice Problems

Module 4: Core Concepts

- Advanced Functions
- Lambda Functions
- map(), filter(), reduce()
- Recursion
- Scope & Lifetime of Variables
- Modules & Packages
- Built-in Functions
- Date & Time

Module 5: Object-Oriented Programming (OOP)

- Classes & Objects
- Attributes & Methods
- Constructors (**init**)
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction
- Magic Methods (**str**, **repr**, **add**, etc.)
- Class & Static Methods

Module 6: Error Handling

- Exceptions & Handling
- try / except / finally
- raise & Custom Exceptions
- Assertions
- Logging Basics

Module 7: File Handling

- Reading & Writing Text Files
- CSV File Handling
- JSON File Handling
- Pickle & XML Files
- Context Managers (`with` statement)

Module 8: Advanced Python

- Iterators & Iterables
- Generators
- Decorators
- Closures
- Regular Expressions (regex)
- Multithreading & Multiprocessing
- Async / Await (Asynchronous Programming)
- Memory Management & Garbage Collection

Module 9: Modules & Libraries

- os, sys
- math, random, statistics
- shutil, collections, itertools, functools
- pathlib

Module 10: Data Science Basics

- NumPy Basics (arrays, operations)
- Pandas Basics (Series, DataFrame, operations)
- Matplotlib & Seaborn (plots, visualization)
- Simple Statistics
- Probability & Hypothesis Testing
- Data Cleaning & Exploratory Data Analysis (EDA)

Module 11: Web & Automation

- Flask Basics
- Django Intro
- FastAPI Intro
- REST API Calls with Requests
- Web Scraping with BeautifulSoup
- Selenium Basics
- Playwright Automation

Module 12: Machine Learning Basics

- scikit-learn Introduction
- Regression Models
- Classification Models
- Clustering Models
- Model Evaluation Metrics

Module 13: Projects

- **Beginner Projects:** Calculator, Number Guess, Todo List, Rock-Paper-Scissors, Password Generator
- **Intermediate Projects:** Student Management, Weather App (API), Expense Tracker, Quiz App, Blog CMS
- **Advanced Projects:** E-commerce Store, Chat App, Face Recognition, Sentiment Analysis, Recommendation System