📘 Python Course – Complete Syllabus

1. Python Basics

- What is Python?

- Why use Python?

- Installing Python + VS Code / PyCharm

- Variables

- Data Types (int, float, string, bool)

- Input & Output

- Comments

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2. Operators

- Arithmetic Operators

- Comparison Operators

- Logical Operators

- Assignment Operators

- Bitwise Operators

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3. Control Flow

- if, elif, else statements

- Nested if

- match (Python 3.10+)

- for loop

- while loop

- break, continue, pass

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4. Data Structures

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- Strings

- Lists

- Tuples

- Sets

- Dictionaries

- List / Dictionary Comprehensions

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5. Functions

- Defining functions (def)

- Parameters & Return values

- Default Arguments

- *args and **kwargs

- Lambda functions

- Recursion

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6. Modules & Packages

- Importing modules

- Creating your own modules

- Common built-in modules:

    o math

    o random

    o datetime

    o os

    o sys

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7. File Handling

- Opening files

- Reading and writing

- File modes (r, w, a)

- Working with text, JSON, CSV files

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8. Object-Oriented Programming (OOP)

- Classes and Objects

- Constructor

- Encapsulation

- Inheritance

- Polymorphism

- Abstraction

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9. Error Handling

- try, except, finally

- Common Python errors

- Creating custom exceptions

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10. Python Libraries

- **NumPy** (Arrays, math operations)

- **Pandas** (DataFrames, CSV, Excel handling)

- **Matplotlib / Seaborn** (Basic charts)

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11. Mini Projects

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Examples:

- Calculator

- To-Do List

- Quiz App

- Password Generator

- Data analysis on a CSV file

- Web scraping (basic)

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12. Capstone Project (Final Project)

Examples:

- Weather App

- Student Management System

- E-commerce Inventory System

- Basic Chatbot