📘 **Module 1: Introduction to Python**

- What is Python and why use it?
- Installing Python and setting up the environment (IDLE, VS Code, Jupyter Notebook)
- Writing your first Python program (print("Hello, World!"))
- Understanding syntax, indentation, and comments

🔢 **Module 2: Python Basics**

- Variables and data types (int, float, string, boolean)
- Input and output functions
- Type conversion and basic operators (arithmetic, comparison, logical)
- String operations and formatting

🔄 **Module 3: Control Structures**

- Conditional statements (if, elif, else)
- Loops (for, while)
- Loop control (break, continue, pass)
- Practical exercises (multiplication table, number guessing game)

📂 **Module 4: Data Structures**

- Lists: creation, indexing, slicing, methods
- Tuples: immutability and usage
- Sets: uniqueness and operations
- Dictionaries: key-value pairs and methods
- Nested data structures

🛠️ **Module 5: Functions & Modules**

- Defining and calling functions
- Parameters, return values, scope of variables
- Built-in functions vs. user-defined functions
- Importing and using modules (math, random, datetime)
- Creating your own modules

📝 **Module 6: File Handling**

- Reading and writing text files
- Working with CSV files
- Exception handling (try, except, finally)
- Practical project: Student record management system

🧩 **Module 7: Object-Oriented Programming (OOP)**

- Classes and objects
- Attributes and methods
- Constructors (__init__)
- Inheritance and polymorphism
- Real-world example: Bank account system

🌐 **Module 8: Python Libraries & Applications**

- NumPy basics (arrays, operations)
- Pandas basics (dataframes, data analysis)
- Matplotlib basics (data visualization)

- Introduction to web scraping (requests, BeautifulSoup)
- Small project: Data visualization of student marks

🤖 **Module 9: Advanced Topics (Optional for Enthusiasts)**

- Virtual environments and package management (pip, venv)
- Introduction to APIs and JSON
- Basics of GUI programming (Tkinter)
- Introduction to machine learning libraries (scikit-learn overview)

🎓 **Module 10: Final Project & Assessment**

- Choose a project (e.g., calculator app, quiz game, expense tracker, or data analysis project)
- Apply concepts from all modules
- Presentation and evaluation

🏆 **Learning Outcomes**

By the end of this course, learners will:

- Understand Python syntax and programming fundamentals
- Write programs using control structures and data structures
- Work with files and handle errors gracefully
- Apply OOP concepts to real-world problems
- Use Python libraries for data analysis and visualization
- Build small projects independently