

Python Course Contents

Course Duration: One Month

1. Introduction to Python

- What is Python? History and features
- Installing Python and setting up the environment
- Running Python scripts and using interactive shell (REPL)
- Writing your first Python program: Hello, World!

2. Basics of Python Programming

- Variables and data types (int, float, str, bool)
- Basic input/output operations (input(), print())
- Comments and code style
- Operators (arithmetic, comparison, logical, assignment)

3. Control Flow

- Conditional statements: if, elif, else
- Loops: for, while
- Loop control: break, continue, pass

4. Data Structures

- Lists and list methods
- Tuples
- Dictionaries
- Sets
- Understanding mutability

5. Functions

- Defining functions (def)
- Function arguments and return values

- Keyword and default arguments
- Variable-length arguments (*args, **kwargs)
- Lambda functions (anonymous functions)
- Scope and lifetime of variables

6. Modules and Packages

- Importing modules
- Exploring built-in modules (math, random, datetime)
- Creating your own modules
- Installing and using external packages (pip)

7. File Handling

- Reading and writing files
- Working with text and binary files
- Using with statement for file handling

8. Exception Handling

- Understanding errors and exceptions
- Try, except, else, finally blocks
- Raising exceptions

9. Object-Oriented Programming (OOP)

- Classes and objects
- Attributes and methods
- Constructor (__init__)
- Inheritance and polymorphism
- Encapsulation and private variables

10. Advanced Topics (optional based on course length)

- List comprehensions

- Generators and iterators
- Decorators
- Context managers
- Regular expressions (regex)
- Working with JSON and CSV files

11. Practical Projects and Applications

- Small projects like calculator, to-do app, text-based game
- Web scraping basics (using requests and BeautifulSoup)
- Introduction to libraries for data analysis (pandas, numpy)
- Automation scripts