Progressive Software Solutions and Training

Core Python – Course Syllabus

1. Program Logic & Flowcharts

- Introduction to Programming Logic
- Problem-Solving Methodologies
- Algorithms & Flowcharts

2. Introduction to Python

- Key Features of Python
- Running Python Programs
- Identifiers & Reserved Keywords
- Variables & Comments
- Indentation & Code Blocks
- Single-Line & Multi-Line Statements
- Grouping Multiple Statements (Suite)
- Working with Quotes
- Input, Output & Import Functions
- Operators in Python – Arithmetic, Comparison, Assignment, Bitwise, Logical, Membership, Identity, Operator Precedence

3. Data Types & Operators

- Numbers – Mathematical, Trigonometric & Random Functions
- Strings – Escape Characters, Formatting Operators & Functions
- Lists – Built-in Functions & Methods
- Tuples – Built-in Functions
- Sets & Frozensets – Functions & Methods
- Dictionaries – Functions & Methods
- Mutable vs Immutable Objects
- Data Type Conversion

4. Flow Control

- Decision Making – if, if-else, if-elif-else, Nested if
- Loops – for, while, and loop-else statements
- Nested Loops
- Control Statements – break, continue, pass
- Loop Types – Infinite, Top-Tested, Mid-Tested, Bottom-Tested

5. Functions

- Defining & Calling Functions
- Function Arguments – Required, Keyword, Default, Variable-Length
- Anonymous (Lambda) Functions – Uses and Applications

6. Modules & Packages

- Built-in Modules
- Creating Custom Modules
- Importing Modules – import, from-import, import *, Renaming Imports
- Module Search Path & PYTHONPATH
- Namespaces & Scope
- Useful Functions: dir(), reload()
- Working with Packages
- Date & Time Modules – time, calendar, datetime

7. File Handling

- Opening Files (Modes & Attributes)
- Reading & Writing Files
- Closing Files Safely
- File Methods
- Renaming & Deleting Files
- Directory Operations – mkdir(), chdir(), getcwd(), rmdir()

8. Object-Oriented Programming (OOP)

- Defining Classes & Creating Objects
- Class Attributes & Methods
- Constructors & Destructors
- Encapsulation & Data Hiding
- Inheritance – Single, Multilevel, Multiple, Base Class Constructor Invocation
- Method Overriding
- Polymorphism & Operator Overloading

9. Exception Handling

- Built-in Exceptions
- Handling with try, except, finally
- Multiple Exception Clauses
- Raising Exceptions
- Exception Arguments
- Assertions

10. Regular Expressions

- Functions: match(), search(), findall(), compile()
- Search & Replace Patterns
- Modifiers (Option Flags)
- Character Classes & Special Classes
- Repetition Cases

11. Database Programming Basics

- Connecting to Databases
- Creating & Managing Tables
- CRUD Operations – Insert, Update, Delete, Select
- Transaction Control – COMMIT, ROLLBACK
- Disconnecting from Databases
- Exception Handling in Database Operations