

## Course Title: **Python Programming Essentials**

### Course Objective

- Understand Python's syntax, semantics, best practices, and the process of setting up the programming environment.
- Learn essential programming concepts in control flow, data structure, functions, and object-oriented programming to design reusable and effective coding practices.
- Develop hands-on experience with file handling, database connectivity, and GUI design to build functional and interactive applications.
- Build a strong foundation for advanced learning or a career in software development, data analysis, and related fields.

### Course Outline

#### **Chapter 1 Introduction to Python**

- 1.1 Overview of Python
- 1.2 Setting up the Python Environment
- 1.3 Writing and executing your first python program
- 1.4 Python Syntax, Comments and Best Practices

#### **Chapter 2 Python Basic**

- 2.1 Variables and Data Types
- 2.2 Basic Input and Output Operations
- 2.3 Operators

#### **Chapter 3 Control Flow**

- 3.1 Conditional Statements
- 3.2 Loops
- 3.3 Break, Continue, and Pass Statements

## **Chapter 4    Functions**

- 4.1   Defining and Calling Functions
- 4.2   Function Parameters and Return Values
- 4.3   Lambda Functions
- 4.4   Scope and Lifetime of Variables
- 4.5   Built-in Functions

## **Chapter 5    Python Data Structures**

- 5.1   Lists and List Comprehensions
- 5.2   Tuples and Sets
- 5.3   Dictionaries and Dictionary Comprehensions

## **Chapter 6    File Handling**

- 6.1   Opening a File
- 6.2   Reading from Files
- 6.3   Writing to File
- 6.4   Closing a File
- 6.5   Working with CSV Files

## **Chapter 7    Error Handling**

- 7.1   Introduction to Exceptions
- 7.2   Handling an Exception
- 7.3   Raising Exception

## **Chapter 8    Introduction to Object-Oriented Programming (OOP)**

- 8.1   Understanding Classes and Objects
- 8.2   Defining and Using Methods

## **Chapter 9    Working with Libraries and Modules**

- 9.1   Importing and Using Python Standard Libraries
- 9.2   Exploring Commonly Used Libraries

### 9.3 Creating and Using Custom Modules

## **Chapter 10 Working with Databases**

### 10.1 Introduction to SQL

### 10.2 Connecting to Databases with Python

### 10.3 Performing CRUD Operations

## **Chapter 11 Graphical User Interface (GUI)**

### 11.1 Introduction to Tkinter

### 11.2 Working with Widgets

### 11.3 Controlling Layout with Geometry Managers

### 11.4 Making your application interactive