

# Python Syllabus

## 1: Introduction to Python

### 1. Overview of Python

- history and Features
- Installation and Setup

### 2. Basic Syntax

- Writing and Executing Python Programs
- Basic Data Types (Numbers, Strings, Lists, Tuples, Dictionaries, Sets)
- Variables and Constants

### 3. Control Structures

- Conditional Statements (if, elif, else)
- Loops (for, while)

## 2: Functions and Modules

### 1. Functions

- Defining Functions
- Function Arguments (default, keyword, variable-length)
- Lambda Functions

### 2. Modules and Packages

- Importing Modules
- Creating and Using Packages
- Standard Library Modules

## 3: Data Structures

### 1. Lists and Tuples

- Operations and Methods

### 2. Dictionaries and Sets

- Operations and Methods

### 3. Comprehensions

- List, Dictionary, and Set Comprehensions

## 4: File Handling

### 1. Reading and Writing Files

- Text and Binary Files

## 2. File Methods

- open(), read(), write(), close()

## 5: Exception Handling

### 1. Errors and Exceptions

- Handling Exceptions with try-except
- Raising Exceptions
- Custom Exceptions

## 6: Object-Oriented Programming

### 1. Classes and Objects

- Defining Classes
- Creating Objects

### 2. Class Attributes and Methods

- Instance Methods, Class Methods, Static Methods

### 3. Inheritance and Polymorphism

- Single and Multiple Inheritance
- Method Overriding

## 7: Advanced Topics

### 1. Decorators

- Function and Class Decorators

### 2. Generators and Iterators

- Creating and Using Generators
- Iterator Protocol

### 3. Context Managers

- Using with Statement

## 8: Libraries and Frameworks

### 1. Web Development

- Flask

### 2. Data Science and Machine Learning

- NumPy
- Pandas
- Matplotlib
- Scikit-learn

## **9: Version Control and Deployment**

### **1. Git and GitHub**

- Version Control with Git
- Working with GitHub

## **10: Advanced Python Concepts**

### **1. Concurrency and Parallelism**

- Threading
- Multiprocessing