

Python Programming

Course Duration: 40 Hours

Course code: PY

1. Course Overview

This Python Programming Training provides a comprehensive introduction to Python, covering installation, syntax, and programming fundamentals. Learners will master data types, variables, control flow, loops, and essential data structures like lists, tuples, and dictionaries. The course also dives into functions, file handling, exception management, and object-oriented programming for writing robust and maintainable code. Emphasizing modular programming and code reusability, it prepares learners for real-world software development. The bootcamp concludes with GUI development using Tkinter, teaching event-driven programming to create interactive applications.

2. What you'll learn?

SSDN Technologies' Python Programming course offers foundational to advanced skills for aspiring developers and IT professionals.

- Target Audience and Job Roles:
- Beginner software developers seeking to learn Python
- Data analysts who want to leverage Python for data manipulation and analysis
- IT professionals looking to automate tasks or develop scripts with Python
- Students and academic researchers requiring Python for scientific computing
- Quality assurance engineers interested in writing test scripts
- System administrators for scripting and automation
- Technical professionals transitioning into programming roles
- Web developers who intend to use Python for backend development
- Hobbyists and DIY enthusiasts looking to apply Python in hardware projects (e.g., Raspberry Pi)

- Professionals in data-intensive fields (finance, biology, etc.) looking for a powerful scripting language
- Educators and trainers teaching programming concepts
- Entrepreneurs and business owners needing to understand the technical aspects of their products or services

3. Target Audience

- Beginners with no prior programming experience.
- Programmers looking to learn Python for web, data, or automation.
- Students and IT professionals seeking Python skills for career growth.
- Developers transitioning from other languages to Python.

4. Pre-Requisites

- Basic computer literacy.
- No prior programming experience required.

5. Course content

Module 1: Introduction to Python

- Introduction to Python
- Overview of Python-Based Applications
- Environment Setup
- Data Types
- Variables and Scope
- Data Structures
- Operations on Data Structures
- Input and Output Operations
- Writing a Python Module

Module 2: Functions

- Defining and Using Custom Functions
- Types of Functions
- Types of Arguments
- map() Function
- filter() Function
- reduce() Function
- Naming Conventions
- Using Imports
- Documentation
- Executing Modules as Scripts
- Extended Keyword Arguments (*args, **kwargs)
- Lambda Functions
- Decorators

Module 3: Iterables and Conditional Statements

- Definitions
- Sequences
- Unpacking Sequences
- Dictionaries
- The len() Function
- Sets
- Conditional Statements
- Loops in Python
- break and continue
- The enumerate() Function
- Generators
- List Comprehensions
- Advanced List Comprehensions
- Collections Module

- Mapping and Filtering
- Mutable and Immutable Built-in Objects
- Sorting
- Unpacking Sequences in Function Calls

Module 4: Modules

- What are Modules
- General Format
- Importing Modules
- Executing Functions from Other Modules
- The `__name__` Variable

Module 5: Python Strings

- Quotation Marks and Special Characters
- String Indexing
- Slicing Strings
- Concatenation and Repetition
- Common String Methods
- String Formatting
- Namespaces
- Formatted String Literals (f-strings and `.format()` method)
- Built-in String Functions

Module 6: Python Dates and Times

- Understanding Time
- The time Module
- The datetime Module

Module 7: Math

- Arithmetic Operators

- Assignment Operators
- Built-in Math Functions
- The math Module
- The random Module

Module 8: File Processing

- Opening Files
- The os and os.path Modules
- Reading Files
- Writing into a File
- Appending Data into a File

Module 9: Exception Handling

- except Clauses
- The else Clause
- The finally Clause
- Using Exceptions for Flow Control
- Raising Your Own Exceptions
- Exception Hierarchy

Module 10: Object-Oriented Programming (OOP) in Python

- Introduction to Object-Oriented Python
- Creating Classes, Methods, and Objects
- Using Constructor and Attributes
- Using Class Attributes and Static Methods
- Understanding Object Encapsulation
- Private Attributes and Methods
- Controlling Attribute Access
- Creating and Accessing Properties

Module 11: Playing with Data

- Relational Databases
- CSV Files
- Getting Data from the Web
- JSON
- Overview of Data Serialization
- Importance of Data Interchange Formats
- Understanding JSON Syntax and Structure
- Encoding Python Data to JSON (Serialization)
- Decoding JSON to Python Data (Deserialization)
- Introduction to XML
- Parsing XML with `xml.etree.ElementTree`
- Best Practices in XML Processing
- Introduction to CSV Format
- Reading CSV Data
- Writing Data into CSV Files
- Best Practices for CSV Processing
- Integrating JSON, XML, and CSV Using Pandas

Module 12: NumPy

- Introduction to NumPy
- Installation
- NumPy Arrays (`numpy.array`)
- Array Indexing and Slicing
- Array Shape and Reshaping
- Array Operations (Sum, Mean, etc.)
- `numpy.arange` and `numpy.linspace`
- Array Stacking and Splitting
- Data Type Promotion

- Formation of 1D, 2D, and 3D Arrays
- Exploring Dimension, Type, Shape, and Size of Arrays
- Indexing and Slicing of NumPy Arrays
- One's Matrix and Zero's Matrix
- Identity Matrix
- min() and argmin()
- max() and argmax()
- np.sort() and np.argsort()
- Addition and Multiplication of Matrices

Module 13: Pandas

- Introduction to Pandas
- Series
- DataFrames
- Handling Missing Data
- Merging, Joining, and Concatenating
- Operations on DataFrames
- Data Input and Output
- groupby()
- Pivoting
- VLookup

Module 14: Tkinter

- Introduction to GUI Development
- Introduction to Tkinter
- First Steps to Creating Tkinter Applications
- Geometry Manager
- Grid Layout
- Developing an Application with Tkinter
- Project Exercise on Tkinter

Module 15: Project

- Bill Generator for a Shopping Mall
- Pizza Ordering Kiosk Using Tkinter

Module 16: Testing and Debugging

- Testing for Performance
- The unittest Module

