

Basic Python BT111

24 hours

Course Outline:

Python is a powerful, widely used and very common object-oriented programming language. Although Python is considered one of the easiest languages to learn due to its simple and clean syntax. Simplicity and efficiency of the language have made it one of the most popular in the world and is on almost every platform that exists. The language is very widely used in a large variety of fields and is now considered a mandatory tool in the field of Big Data.

Beyond these areas, Python is widely used in the fields of artificial intelligence, data analysis and machine learning - areas that require rapid analysis and calculations due to high computing capabilities of Python.

This course provides participants with basic but practical knowledge of the Python language and prepares them to start working with Statistics, web development and applications (mainly server side), networks, cyber and even interfaces development on huge amounts of information and touching on graphics and games.

Main objectives of the course:

- Learning of general topics and concepts from the world of programming that will serve the students as an introduction to the world of development will help them in any language they want to learn in the future.
- As part of the course, participants will learn to write Python programs from scratch, using one of the environments that is the most common for development in the industry
- Proper learning of proper syntax, proper use of indentations, assimilation of logic in programs, efficient design of code.
- Effective work with the variety of types of arrays of the language.
- Use and creation of user functions.
- Reading and writing text files.

Who should attend the course:

The course is intended for those with little to no programming experience whatsoever, but is also appropriate for people who already know to code and want to add Python to their tool belt.



Prerequisites:

There are no prerequisites for this course. Previous experience with another programming language is an advantage

Course Contents:

Module 1 - Intro

- Installation and familiarity with the work environment
- Historical overview
- Benefits of language
- What is Python Introduction

Module 2 - Basic calculations and threads

- Basic calculations and threads
- Boolean numbers, strings and expressions
- Special characters
- Print shapes
- The print function
- Prints and Letters

Module 3 - Variables

- What are variables
- Initialize and update variables
- Working with variables and combining them with more complex expressions

Module 4 - Libraries

- What is a library and what is its role
- Benefits of using libraries
- Standard Library VS General Library Database
- How to find the right directory
- Import and use of libraries



Module 5 - Strings

- Identifying objects by type
- Functions versus methods
- Text manipulations
- Dynamic functions using f-strings
- Immutable Values
- Creating random values
- Advanced numerical calculations

Module 6 - Data from Users

- Input function
- Storing and using user data
- Manipulating data between various tables

Module 7: Slicers

- Extract a character from a cut string
- Strings by setting ranges
- Cutting characters at regular "intervals"
- Inverting strings
- Dynamically retrieving parts from a string

Module 8: Flow Control

- The point of logic in a program
- Setting parameters
- Using complex boolean expressions
- Setting complex conditions using else/elif
- Nested Conditions
- While Loops
- For Loops
- Combining loops and conditions
- Nested Loops

Module 9: Data Structures

- What is an array: The role of arrays in Python
- Lists: Define lists, Managing entries in lists, Perform actions and manipulations on lists, Dedicated methods
- Tables: The difference between a table and a list, Dealing with tables and common uses



- Dictionaries: syntax, Common uses and practical examples, Data management in dictionaries, Dedicated methods, Use dictionaries to produce, Switch functionality
- Sets: Unique characteristics, Common uses, Value management in Set, Performing set comparisons (Set Operations)

Module 10: Creating functions

- What is a function?
- The utility in defining user functions
- Basic structure and syntax
- Setting parameters
- Add default values
- Setting up Docstrings
- The Return command
- Variable Scope
- Calling functions from functions

Module 11: Working with Files

- Accessing a file from Python
- Creating a File Object
- Absolute vs. Relative Pathway
- Finding Active Directory using Sprite OS
- Reading text files in different ways
- Creating Files
- Writing to existing files

Module 12: Practical day - Working with image files

- Access to file attributes
- Resize the image
- Crop photos
- Rotation and reversal
- Color change
- Adding effects (filters)
- Merge photos
- Writing on pictures
- Save edited photos



Module 13: Creating a Web Application

As part of this module, participants will build 2 applications from scratch - a password generator and an application for editing images graphically (without the use of code)

- Creating an application on a local server using the streamlit directory
- Creating graphic elements such as titles, panels, forms, buttons and more.
- Receiving information from the user in a variety of ways.
- Dynamically retrieve data and display them in tabular format on request
- Export data to Excel files at the click of a button
- Uploading the app to a public server

