

This specific module describes the skills, knowledge and attitude required to Apply Python Programming. This module is intended to prepare learners pursuing TVET Level 5 in Networking and Internet Technologies. Upon completion of this module, the learner will be able to Prepare python environment, write basic python program and Apply object-driven in python

At the end of the module the learner will be able to:

1. Prepare python environment

2. Write basic python program

3. Apply object-driven in python

# 1. Prepare python environment

## 1.1 Python tools are properly selected in accordance with computer operating system

### Python programming overview

Computers and programs are everywhere in today's world. Programs affect many aspects of daily life and society. People depend on programs for communication, shopping, entertainment, health care, and countless other needs. Learning how to program computers opens the door to many careers and opportunities for building a better world.

**Python** is an i*nterpreted*, *object-oriented*, *high-level programming language* with *dynamic semantics*. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed. (Python\_Community)

**Programs** consist of statements to be run one after the other. A **statement** describes some action to be carried out.

The statement **print("Good morning")** instructs Python to output the message **"Good morning"** to the user. The statement **count = 0** instructs Python **to assign the integer 0** to the variable **count**.

A **computer** is an electronic device that **stores** and **processes** information. Examples of computers include smartphones, tablets, laptops, desktops, and servers. Technically, a **program** is a *sequence of instructions that a computer can run*. Programs help people accomplish everyday tasks, create new technology, and have fun.

* What are the characteristics of Python?

Python has many important features for programmers, both for those who are starting out as well as for those who already have knowledge and want to try new things or experiment. Some of its main features include:

* **Object oriented**

One of the main characteristics of Python is that it is an object-oriented programming language. This means that Python recognizes the concept of class and object encapsulation, which makes coding with Python more efficient in the long run.

As such, Python makes it easy to create inherited object classes. This means that, building from things that have already been done, you can create new classes that will inherit the attributes of the previous ones, which simplifies and improves the long-term efficiency of the code.

* **Open Source**

Yet another of the main characteristics of Python is that it is an open source programming language. Anyone can create and contribute to its development.

This in turn means that it has a large community that works to improve and facilitate the learning of this programming system. Also, it is free to download for any operating system, including Windows, Mac or Linux.

* **Easy to learn**

Python is a very user-friendly code for all types of developers, from those who already have experience with other languages to those who are learning to program from scratch.

If you already have experience with C, C++, Java or C#, Python is a good system with which to continue growing and expanding your programming knowledge. If you’re just starting out, with the right training, it’s easy to jump in and learn how to do things in a very short time.

* **Integration and adaptation**

Another of the main characteristics of Python is that it is an integrated programming language. This means that it executes the code line by line.

What does this imply? It means that Python, unlike other coding languages, does not compile, which makes the process of debugging code much easier and more efficient. Another advantage of this characteristic of Python is that it makes execution easier and saves time in the long run.

* **GUI support**

GUI stands out for Graphical User Interface, which is a key aspect of any programming language as it helps add style to the code and makes the programmer’s work much more visible.

In this sense, Python is compatible with a wide range of GUIs, which can be easily imported, making it a widely used system in Data Science, as it facilitates data visualization.

* **High level programming**

As we said at the beginning, one of the main characteristics of Python is that it has been designed to become a high-level programming language.

That means that, when working with it, you don’t need to know the code structure, architecture, or memory management. This simplifies the work of programmers.

* **Portable**

Let’s see this feature through a practical case: suppose you are working with Python on Windows, but you need to transfer your work to Mac or Linux. With Python you can do this without having to make any changes in the code.

This portability between different operating systems is something that not all programming languages have, which is why Python has become one of the most portable systems today, a great advantage in its main fields of application. .

## 1.2 Python tools are properly installed in accordance with Operating System

## 1.3 Python installation is successfully tested based on output of python version command

# 2. Write basic python program

## 2.1 Python concepts are effectively applied based on python standards

## 2.2 Control structures are properly applied in accordance with python standards

## 2.3 Functions are properly applied in accordance with python standards

## 2.4 Collections are properly applied in accordance with python standards

## 2.5 File handling is properly performed in accordance with python standards

# 3. Apply object-driven in python

## 3.1 OOP Concepts are properly applied in line with python standards

## 3.2 Python date and time concepts are applied according to python standards

## 3.3 Libraries are properly used in accordance with python standards

## 3.4 System automation is properly applied based on specific task