Programming with Python

Lecturer: Massimo Ballerini

Language

English

Course description and objectives

The course aims at providing students with the **basic elements** of the programming language Python.

Students will acquire all the basic concepts about the programming process, learning how to use different types of data, how to manage control structures, how to use the main functionalities and how to create custom ones.

Specifically, at the end of the course, students will be able to:

- Implement simple algorithms
- Import external modules to develop simple software projects

Audience

The course is open exclusively to students of the Master of Science Programs at Bocconi University and is offered as part of the **Enhancing Experience – Curricular Integrative Activities**. Upon successful completion of the course (attendance of at least 75% of the scheduled hours and passing the final exam), students will get **2 credits** and an **Open Badge**, which can be shared across the web (LinkedIn) or personal CV.

Prerequisites

It is essential to know how to manage files and use the local resources of the operating system installed on your computer.

Duration

24 hours

Teaching mode

Distance learning. Lessons will take place **exclusively** in **synchronous remote mode**.

The **final test** on the last day of class, however, can **only** be taken **in physical presence**. Online mode will not be provided.

Calendar

Lecture	Date	Time	Room
1	Thu 26/03/2026	18.15 - 19.45	36 (Sarfatti)
2	Fri 27/03/2026	14.45 - 16.15	36 (Sarfatti)
3	Fri 27/03/2026	16.30 – 18.00	36 (Sarfatti)
4	Mon 30/03/2026	18.15 - 19.45	36 (Sarfatti)
5	Fri 03/04/2026	14.45 - 16.15	36 (Sarfatti)
6	Fri 03/04/2026	16.30 – 18.00	36 (Sarfatti)
7	Mon 13/04/2026	18.15 - 19.45	36 (Sarfatti)
8	Mon 27/04/2026	18.15 - 19.45	36 (Sarfatti)
9	Mon 04/05/2026	18.15 - 19.45	36 (Sarfatti)
10	Fri 08/05/2026	14.45 - 18.00	36 (Sarfatti)
11	Fri 08/05/2026	14.45 - 18.00	36 (Sarfatti)
12	Tue 12/05/2026	18.15 - 19.45	InfoAS04/05

Syllabus of the course

Lesson	Topics

1	**Introduction to Python**
	- Short Introduction to computer programming languages
	- Why to use Python version 3 and how to install it
	- IDLE and other development interfaces
	- Execution modes
	  o From the shell
	  o From the editor
	- Where to find support: comments, online help, documentation, community
	Exercises

2 Variables and elementary data types

- Variables as memory references
- Variables creation and update with the assignment instruction
- Numeric types and string type
- Introduction to modules (libraries) and built-in functions
- Calculations and execution priorities
- Input and output
- Conversion of data types

Exercises

3 Programming – part 1: conditional constructs and errors

- Simple and nested *if* (*elif*)
- Logical operators (*and*, *or*, *not*)
- Conditional operators
- Types of errors
- Debug and test of a program
- Error handling: *try* and *except*

Exercises

4 Programming – part 2: iterative constructs

- *for* and *while* loops
- Nested cycles
- Forced exit from cycles: *break* and *continue* instructions
- How to nest different types of structures

Exercises

5 Programming – part 3: functions

- Defining a function
- Input parameters: mandatory and optional arguments
- Output: productive and void functions
- Recursive functions

Exercises

6 Complex data structures – part 1: what they are

- Structures taxonomy
- Strings, tuples and lists: indexing and slicing
- Dictionaries: keys and values
- How to create, edit, delete elements in a data structure

Exercises

7 Complex data structures – part 2: how to interact

- Strings: methods and functions
- Tuples: methods and functions
- Lists: methods and functions
- Dictionaries: methods and functions

Exercises

8 Complex data structures – part 3: custom classes

- The concept of class and instance
- Attributes and methods
- Inheritance
- Overloading and overriding

Exercises

9 Working with the standard library modules

- Use of the standard library
- Examples of standard library modules

Exercises

10 Working with modules of third-party libraries

- Search, installation and use of external modules
- Read and write text files
- Read and write Excel files

Exercises

11 Summary Exercise

12 Q&A

Final test (mandatory)

Software

Python 3.x with IDLE

Suggested bibliography

Clerici A., De Pra M., Debernardi C., Tosi D., *Learning Python*, Egea, 2020

Reference web links:

- Official site: https://www.python.org/
- Official documentation: https://docs.python.org/3/
- Repository of official external modules: https://pypi.org/

Available seats

This activity is limited to **110** participants and reserved to **students of the Master of Science Programs**. Registrations cannot be carried out once this number has been reached or after closing of the registration period.