Programming with Python (2ed)

Lecturer: Ivan Renesto

Language

English

Course description and objectives

The course aims at providing students with the basic elements of the programming language Python and its applicative domains: artificial intelligence, multimedia and games, automation, scripting, graphical user interfaces, networking, machine learning, etc.

Students will acquire all the basic concepts about the programming process with Python, how to use data structures, and how to import external libraries.

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

- Implement simple algorithms
- Select and use external Python libraries and functions to develop real software projects

Audience

The course is open exclusively to students of the Master of Science Programs at Bocconi University and is part of the Curricular Integrative Activities that are worth 2 credits (subject to 75% attendance and to passing the final test).

Prerequisites

It is useful (although not mandatory) to know the essentials of computer programming logic.

Duration

24 hours

Teaching mode

The course will be held in distance learning mode. It will be possible to follow the live streaming (Live Session) of each lesson accessing through Blackboard to the corresponding virtual room.

Calendar

Lecture	Date	Time
1	Wed 24/03/2021	18:40 – 20:10
2	Thu 25/03/2021	18:40 – 20:10
3	Wed 31/03/2021	18:40 – 20:10
4	Thu 01/04/2021	18:40 – 20:10
5	Wed 14/04/2021	18:40 – 20:10
6	Thu 15/04/2021	18:40 – 20:10
7	Wed 21/04/2021	18:40 – 20:10
8	Thu 22/04/2021	18:40 – 20:10
9	Wed 28/04/2021	18:40 – 20:10
10	Thu 29/04/2021	18:40 – 20:10
11	Wed 05/05/2021	18:40 – 20:10
12	Thu 06/05/2021	18:40 – 20:10

Syllabus of the course

Lecture	Topics	Book references

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 (Anaconda, PowerShell, …)
	- Execution modes
	  o From the shell
	  o From the editor
	- Where to find support: comments, online help, documentation, community
	Exercises
		Ch. 1 and 2

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***	Ch. 3 and 4
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***	Ch. 5

Lecture	Topics	Book references
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***	Ch. 6
5	**Programming – part 3: functions** - Defining a function - Input parameters: mandatory and optional arguments - Output: productive and empty functions - Recursive functions ***Exercises***	Ch. 7
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***	Ch. 8 and 9
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***	Ch. 8 and 9
8	**Complex data structures - part 3: custom classes** - The concept of class and instance - Attributes and methods - Inheritance - Overloading and overriding ***Exercises***	Ch. 12

Lecture	Topics	Book references
9	**Working with the standard library modules** - Use of the standard library - Examples of standard library modules ***Exercises***	Ch. 11
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***	Ch. 10 and 11
11	**Summary Exercise**	Ch. 1 to 12
12	**Q&A** **Final test (mandatory)**	

Software

Python 3.9 with IDLE

Suggested bibliography

Learning Python, Clerici A., De Pra M., Debernardi C., Tosi D., Egea, 2019

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 **60** 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.