

# Python Start

Lecturer: **Andrea Giussani**

## Language

English

## Course description and objectives

The course aims at introducing students with the basic elements of the programming language Python and its applicative domains, mostly in data analytics and ant related computer science filed (e.g. artificial intelligence, machine learning, etc.)

Python is a high level, interpreted and pseudo-compiled, programming language that simplifies the development process.

All the lectures will be structured by following two learning approaches: students' involvement and interactivity; coding.

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:

- Understand the logic behind a programming language
- Implement both simple and complex algorithms
- Select and use external Python libraries and functions to develop real software projects

## Audience

The course is open to **all Bocconi students** (except for **first-year students of the Master's Degree** Programs at Bocconi University to whom is reserved the course "**Programming with Python**"). In particular, to students:

- interested in the software development process
- who care about the emerging topic of data analysis and complexity
- who want to enrich their CV with specific and hot topics

## Prerequisites

No mandatory prerequisite.

In any case, it is strongly suggested that participants have positively followed a computer science curricular course, or they already have basic and general programming skills.

## Duration

20 hours

## Calendar

Lecture	Date	Time	Room
1	Mon 01/04/2019	18.00 - 19.30	Info AS05
2	Thu 04/04/2019	18.00 - 19.30	Info U01
3	Sat 06/04/2019	09.30 - 12.45	Info U01
4	Sat 13/04/2019	09.30 - 12.45	Info U01
5	Wed 17/04/2019	18.00 - 19.30	Info AS05
6	Sat 04/05/2019	09.30 - 12.45	Info U01
7	Wed 08/05/2019	18.00 - 19.30	Info AS04

## Syllabus of the course

Lesson	Topics	Book references
1	<b>Introduction to Python</b> <ul style="list-style-type: none"> <li>- Short Introduction to the language</li> <li>- State-of-the-art and community</li> <li>- Language implementations</li> <li>- Introduction to libraries and modules</li> <li>- Built-in functions</li> <li>- How to run a program:                             <ul style="list-style-type: none"> <li>o From the shell</li> <li>o From the editor (IDLE)</li> </ul> </li> </ul>	Chap. 1

Lesson	Topics	Book references
2	<b>The Coding Process</b> <ul style="list-style-type: none"> <li>- Variables</li> <li>- Defining variables, assignments, updates</li> <li>- Input and output</li> <li>- Numerical data type, Strings Expressions and execution priorities</li> <li>- Data type casting</li> </ul>	Chap. 2 Chap. 5
<i>Exercises</i>		
3	<b>Decision-making Structures and Logical Operators</b> <ul style="list-style-type: none"> <li>- If statement, nested If</li> <li>- Logical Operators (and, or, not)</li> <li>- Logical Connectors</li> </ul>	Chap. 5
4	<b>Decision-making Structures (...more...)</b> <ul style="list-style-type: none"> <li>- Iterative structures:               <ul style="list-style-type: none"> <li>o while</li> <li>o for</li> </ul> </li> <li>- Nested loops</li> <li>- Nested structures</li> </ul>	Chap. 7
<i>Exercises</i>		
5	<b>Functions and Recursion</b> <ul style="list-style-type: none"> <li>- How to define a function</li> <li>- Single vs multi-parameters functions</li> <li>- Void or return functions</li> <li>- Recursive functions</li> <li>- Exception Handling Mechanisms</li> <li>- Debugging and Testing</li> </ul>	Chap. 3 Chap. 6
6	<b>Complex Data Type</b> <ul style="list-style-type: none"> <li>- Sequences</li> <li>- Lists and Tuples</li> <li>- Dictionaries</li> </ul>	Chap. 10 Chap. 12
<i>Exercises</i>		
7	<b>Functional programming</b> <ul style="list-style-type: none"> <li>- Lambda and List Comprehensions</li> <li>- Generators, Iterator and Iterables</li> </ul>	Chap. 11 Chap. 19
8	<b>Python Object Oriented programming</b> <ul style="list-style-type: none"> <li>- The concept of classes, and instance</li> <li>- Attributes</li> <li>- Inheritance</li> <li>- Overloading and Overriding of objects</li> </ul>	Chap. 15 Chap. 18
<i>Exercises</i>		



Lesson	Topics	Book references
9	<b>Data Analysis Libraries and Modules</b> <ul style="list-style-type: none"> <li>- Introduction to datasets</li> <li>- The <i>Numpy</i> library</li> <li>- The <i>Pandas</i> library</li> </ul> <i>Exercises</i>	Chap. 4
10	<b>Final Project</b>	

## Software used

Python 3.x with IDLE, PowerShell, Anaconda

## Suggested bibliography

*Think Python*, 2<sup>nd</sup> edition. Allen Downey, O'Reilly, Green Tea Press, 2015

*Learning Python*, 5<sup>th</sup> edition. Mark Lutz. O'Reilly, Green Tea Press, 2013

## Available seats

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