

6-9 June 2022 - Short course (20 hours, 4 CFU) – Room XX

Dipartimento di Scienze della Terra “A. Desio”, via Mangiagalli 34, Milano



UNIVERSITÀ DEGLI STUDI DI MILANO



Dipartimento di Eccellenza 2018-2022

LE GEOSCIENZE PER LA SOCIETÀ: RISORSE E LORO EVOLUZIONE

Corso di Dottorato in
Scienze della Terra



Introduction to scientific programming with Python *by Fabrizio Magrini*

6 June 2022 : 9-12; 14-16 Logic programming, an introduction

A focus on logic constructs like Boolean expressions, conditional statements, loops, and functions

7 June 2022 : 9-12; 14-16 Algorithms and problem solving

Resolution of basic problems and formulation of simple algorithms in Python

8 June 2022 : 9-12; 14-16 Scientific programming: Python is cool!

Managing and processing files of different extensions made easy, and rendering of high-quality figures

9 June 2022 : 9-12; 14-16 Solutions to real-world problems

Resolution of real-world problems presented by the students themselves



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COURSE DESCRIPTION

In a preparatory lesson, the course will be focused on general, **essential aspects of the logic involved in any programming language**, to provide a firm understanding of logic constructs like Boolean expressions, conditional statements, loops, and functions. In the second lesson, we will apply the thus acquired competences to the **resolution of basic problems and to the formulation of simple algorithms in Python**, whose syntax can be considered particularly intuitive. These algorithms will resemble (in logic) some of the problems one has to cope with when it comes to processing real-world data. Having practiced such aspects, the course will then touch on several tasks that we (as scientists) have to deal with on a daily basis; these involve operations like **managing** (writing, reading, and modifying) **files of different extensions** in an automated fashion, or **representing scientific results in high-quality figures**. Last but not least, in the final lesson, we will focus on the resolution of real-world problems presented by the students themselves. During the whole course, **active interaction with the participants will be highly appreciated and suggested**: the students will be required to write their own algorithms and encouraged to show their results.

