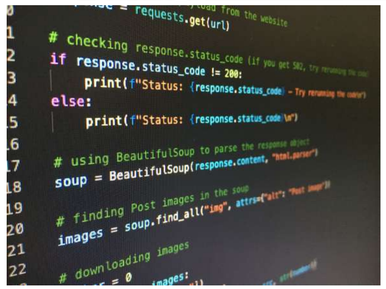
For more information contact: ***Giacomo Mastella giacomo.mastella@uniroma1.it***



Introduction to Scientific Programming with Python

<u>17 June 2025, 9-13 (room B1):</u> ***Introduction to Python, environments, packages and basic operations.***

Working with Python: packages, environments, and IDEs. Operations with arrays, lists and other objects. Plotting of 2D, 3D data.

<u>17 June 2025, 14-18 (room B1):</u> ***Logic programming, an introduction.***

A focus on logic constructs like Boolean expressions, conditional statements and loop.

<u>18 June 2025, 15-18 (room B2):</u> ***Algorithms and problem solving.***

Formulation of simple functions and basic algorithms in Python. Data interpolation, fitting and exploratory data analysis.

<u>19 June 2025, 15-18 (room B2):</u> ***Scientific programming in Python.***

Handling and processing files of different extensions, rendering of high-quality figures and geographic maps.

<u>20 June 2025, 9-13 - 14-18 (room B1):</u> ***Solutions to real-world problems/Introduction to Machine Learning with Python.***

Resolution of real-world problems presented by the students themselves .

ROMA TRE UNIVERSITÀ DEGLI STUDI

June 16-20 2025, room B1/B2, Roma Tre University,
Sezione di Scienze Geologiche, Largo San Leonardo Murialdo 1

DIPARTIMENTO DI SCIENZE DELLA TERRA
SAPIENZA UNIVERSITÀ DI ROMA

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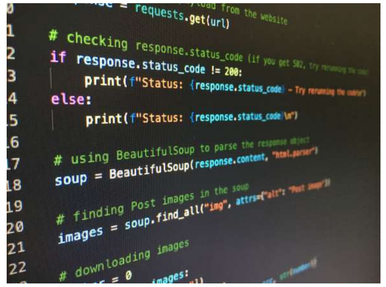

Introduction to Scientific Programming with Python

ABSTRACT

In the first part of the course, participants will receive a **basic introduction to the Python programming language**. The lessions will guide them through **setting up a Python environment, handling packages, and exploring the principal IDEs**. Following this, **fundamental Python containers and objects** will be introduced. A particular emphasis will be placed on **fundamental logical concepts** that are applicable to any programming language. The goal is to establish **a solid comprehension of logical constructs, including Boolean expressions, conditional statements, loops, and functions**. Subsequently, participants will apply these acquired skills to address basic problems and create straightforward algorithms in Python. With hands-on experience in these fundamental aspects, the course will progress to cover various tasks essential for geoscientists in their daily work. This includes **the automation of file editing (writing, reading, and modification)** across diverse extensions. Additionally, participants will learn how to represent scientific findings effectively through **the creation of high-quality figures**. In the concluding session, the focus will shift to **solving real-world problems proposed by the students themselves**, fostering a practical and problem-solving approach. Throughout the entire course, a**ctive interaction with the participants will be highly appreciated and suggested.** Students will be required to write their own algorithms and encouraged to showcase their results, fostering a dynamic and engaging learning environment.

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