PROVIDER N.2224

FIRST CALL

Python for Scientific Programming

February 6-April 3, 2026

organised by
ISTITUTO SUPERIORE DI SANITÀ
Centro Protezione dalle Radiazioni e fisica computazionale (PRORA)

Rationale

Python is one of the most important programming languages to learn because it combines simplicity with versatility. Its clear and readable syntax makes it accessible to beginners, while its powerful features and vast ecosystem of libraries support advanced applications in fields such as data science, artificial intelligence, web development, and scientific computing. Today, Python is also widely used as a "glue language" to make different frameworks and tools interact seamlessly, enabling researchers and developers to integrate diverse systems into coherent workflows. Its strong community support, broad adoption in academia and industry, and continuing relevance in emerging technologies ensure that learning Python is an investment that remains useful over time.
In particular, Python has become essential in the biomedical domain: many state-of-the-art research tools and frameworks are built on it. For example, Biopython for computational biology, NiBabel and Nilearn for neuroimaging, scikit-image and SimpleITK for medical image processing, and PyTorch or TensorFlow for deep learning in biomedical imaging and diagnostics. Large collaborative initiatives such as MONAI (Medical Open Network for AI) also rely heavily on Python to provide reproducible, open, and efficient workflows in medical AI research.

Aim and objectives

Python is today a central tool for scientists across many disciplines. This course will provide the foundation needed to read, write, and modify code independently.
This course is a foundational one, but it is designed to build proficiency in reading, modifying, and using code effectively at a high level. The initial syntax exercises aim to teach the core properties of Python, while classes and objects are introduced to enable the correct and efficient use of scientific libraries. Attention is also given to data types and conversions, which are essential for orchestrating multiple packages and integrating diverse computational tools within a single workflow.
This course introduces Python programming with a focus on applications in scientific computing. No prior programming knowledge is assumed. By the end, students will be able to write Python scripts, manipulate data, visualize results, and apply Python libraries to solve basic scientific problems.

Specific objectives

At the end of the course the participants will be able to:

- Acquire new skills to be used in their research or professional work
- Gain a solid introduction to Python programming
- Write, run, and debug simple Python programs
- Be more independent in developing and modifying code for scientific tasks
- Read and adapt code provided by assistants such as LLMs

Didactic method

Frontal teaching and Hands on exercises in small groups

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GENERAL INFORMATION

Venue
Aula Nitti-Bovet, Istituto Superiore di Sanità
Viale Regina Elena, 299 - Roma

Aula Marotta, Istituto Superiore di Sanità
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Target audience and maximum number of participants
The course is open to anyone who works with data and is interested in learning the fundamentals of scientific programming.
A basic knowledge of data analysis is recommended as a prerequisite.
The course will be delivered in English.
A maximum of 35 participants will be admitted.

For any further information, please refer to the event programme.