PhD course in Physics, Astrophysics, and Applied Physics - Università degli Studi di Milano
PhD cicle 40 (2024-2025)

All lectures will be given in English.

Course title	Python Fundamentals
Teacher in charge of the course	Marco Gherardi
List of the teachers of the course *[surname/name; affiliation; e-mail]*	Marco Gherardi, UNIMI, marco.gherardi@unimi.it
Training objectives	The training objectives are an operational and syntactic knowledge of the Python programming language, and a deep understanding of its semantic characteristics. Particular attention will be given to those aspects that are usually overlooked at first contact with Python as a scripting language. The topics covered will be discussed in the broader context of programming language theory. The successful students will be able to write correct and efficient Python code; moreover, they will be able to learn how to use new modules effectively on their own.
Prerequisites *[please insert details and also **state whether the course has advanced contents** suitable for students with prior knowledge of the topics or is also suitable for students without prior knowledge]*	No prior knowledge of python will be required, but some experience with at least another programming language (such as C++) will be assumed. Some of the more in-depth topics, especially in the second half of the course, will be of interest also to students who already have experience with the language.
Detailed course program	The course will be roughly divided into 7 modules, each one taking 2 to 4 hours. 1 - Scalar types and variables, strings, conditional expressions, loops, modules 2 - Functions 3 - Collections, mutability 4 - Built-in algorithms and their complexity 5 - Comprehensions, iterables, enumerate and zip, unpacking with * and ** 6 - Classes, magic methods, inheritance 7 - Advanced topics (functional programming, decorators, functools, itertools, metaprogramming) Selected topics will be further explored in dedicated practice sessions.
Examination modalities	Individual projects with oral presentation
Preliminary schedule *[please indicate the weeks when the lectures will be given]*	May 12 to June 6 - about 5 hours per week