Course title:

Introduction to Python programming

Duration [number of hours]**: 12**

PhD Program [MERC/MPS/SPACE]**: MERC**

Name and Contact details of unit organizer(s):

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Course Description [max 150 words]**:**

This Unit is intended to introduce student to the fundamentals of python programming. The course will cover concepts start from the bases of procedural programming up to the use of complex libraries for machine learning. After introducing python as a programming language and the main concepts of procedural programming, we will introduce object oriented programming, giving the technical bases needed to understand what are classes and how to implement inheritance and polymorphism in python. Having put the bases of procedural and object oriented programming, we will introduce some key libraries for the use of python for the simulation of differential equations and the implementation of machine learning algorithms. Specifically, the numpy, scitlearn and panda modules will be introduced to the students using examples to help the familiarization with the classes and functions implemented within.
The course will be enriched by a final practical session where all the concepts learnt will be put to use on a relevant case study.

Syllabus [itemized list of course topics]**:**

- Introduction to python
- Object-Oriented programming
- Numpy
- Scitlearn
- Pandas
- Practical session

Assessment [form of assessment, e.g., final written/oral exam, solutions of problems during the course, final project to be handed-in, etc.]**:**

No assignment

Suggested reading and online resources:

1. Zhou, Zhi-Hua. *Machine learning*. Springer Nature, 2021.
2. Raschka, Sebastian. *Python machine learning*. Packt publishing ltd, 2015.