UE Scientific programming in Python

ECTS
3 credits

Component
UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Semester
Automne

- **Teaching language(s):** English
- **Open to exchange students:** Yes
- **Code d'export Apogée:** PAX7ECAL

Presentation

Description

Using a scientific programming language (e.g., Python) as a tool for modelling and numerical analysis.

Outline:

1. Number representation systems and their precision
2. Data in Python
   1. Basic data structures: scalars, strings, lists, dictionaries, sets, tuples
   2. Matrix representations of numbers: the numpy ndarray (vs matrix),pandas data tables
   3. Read and write data according to the data type (CSV, JSON, pickle,. . .)
3. Array operations:
   1. Unitary operators MX0 –> MX1
   2. N-ary operators (MX0, . . . , MXn-1) –> MXn
4. Solving equations
   1. Linear matrix equations with applications to interpolation and regression
   2. Differential equations with applications to interpolation and prediction
5. Probability and statistics in Python
   1. Probability laws: distribution families, random variables, realisations

Non-contractual information.
Last update on 05 December 2023

2. Statistical tests

Course parts

UE Scientific programming and machine learning in Python - CM/TD	Lectures (CM) & Teaching Unit (UE)	14h
UE Scientific programming and machine learning in Python - TP	Practical work (TP)	16h

Recommended prerequisites

Mathematical background on probability and statistics, linear algebra and differential equations

Useful info

Campus

Grenoble - Scientific Polygon

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