

Application for funding of faculty common course 2020

Ansökan om medel för fakultetsgemensam forskarutbildningskurs 2020

English course title

Kursnamn på engelska

Advanced Scientific Programming with Python

Swedish course title

Kursnamn på svenska

Avancerad Vetenskaplig Programmering i Python

Extent (credits)

Omfattning (högskolepoäng)

3

Language of instruction

Undervisningsspråk

English

Recommended prerequisites

Rekommenderade förkunskaper

Students should be familiar with programming but no previous knowledge of Python is required as we will provide all material necessary.

General course objective/s and learning outcomes (Also specify which PhD examination goals that are addressed/covered. Describe how.)

Kursens syfte och mål (Beskriv vilka mål för examen på forskarnivå som beaktas och på vilket sätt.)

The aim of this course is to teach best practices in scientific programming such that students become more effective programmers and eventually spend less time coding and more time doing research. They will be introduced to a range of tools that will enable to be more productive. Furthermore, with the concepts taught in this course, students will be able to produce well-documented and tested code making their work clearer, more reproducible and useful to others. This will improve the students' ability to independently attack a wide range of scientific problems with a variety of computational methods.

Course contents

Kursinnehåll

This course covers the best practices in scientific programming with Python. The decision to use Python is based on the fact that it is commonly used in research across many disciplines. Contents of this course are:

- Introduction to the UNIX shell
- Using git repositories for organizing and sharing code
- Interactive Python programming (Jupyter notebooks)
- Test-driven software development and documentation
- Advanced Numpy/Scipy
- Data containers (HDF5, h5py, pandas)
- Performance (cython, C extensions, multiprocessing, MPI and CUDA)

Instruction (course structure)

Undervisning (kursens uppläggning)

The course will be taught as a 1 week (40 hours) seminar with many hands-on examples. Students will work in pairs on a computer/laptop.

Assessment (form of examination)

Examination (examinationsformer)

Examination is based on attendance (> 90%) and participation in an individual coding project (10 hours).

Course examiner (name, e-mail)

Examinator (namn, e-post)

Filipe Maia (Filipe.Maia@icm.uu.se)

Department with main responsibility

Huvudansvarig institution

ICM

Contact person/s (course responsible teacher) (name, e-mail)

Kontaktperson/er (kursansvarig lärare) (namn, e-post)

Filipe Maia (Filipe.Maia@icm.uu.se)

Course dates/period

Kurs datum/period

Spring 2020

Maximum number of participants

Antal platser

40

Submit the application for admission to

Skicka anmälan till kursen till

Filipe Maia (Filipe.Maia@icm.uu.se)

Submit the application not later than

Skicka anmälan senast

2019-12-31