



CORE FACILITIES

SC00032 Python programming applied to research, 2.5 credits

Python programming applied to research, 2,5 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-03-14, and was last revised on --date---decisionmakingAuthority--. The revised course syllabus is valid from --semester--.

Responsible Department

Core Facilities, Sahlgrenska Academy

Entry requirements

The course is open for PhD students accepted by a Swedish or international university, in need to process and manage biological data.

In order to apply for the course, you should have:

- A background in genetics, cell biology, biomedicine, biochemistry, bioinformatics or similar.

Learning outcomes

After completing the course, the student is expected to be able to:

- List the most common data types and control flow tools used in programming
- Explain basic algorithms for data analysis
- Define a plausible workflow for data
- Identify and interpret coding errors

Knowledge and understanding

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Competence and skills

- Practice python lexical features and syntax
- Apply core python structures and flow control
- Practice with python execution environment
- Handle the file-system with python scripts
- Explore test and debug python best practices

Judgement and approach

- Be able to design, code, and test small Python programs to analyze and manage biological data
- Understand handling of errors and exceptions
- Interpret others' scripts
- Understand the techniques introduced and be able to pick out the methods suitable for their own data

Course content

The course covers:

- Variables
- Data types such as dictionaries, lists, sets
- In-built functions
- Control flow tools such as if, for and pass
- Statements and Comments
- Arithmetic operations
- Own functions
- Input and output

Types of instruction

The course includes a combination of lectures, practical sessions and home assignments

Language of instruction

The course is given in English.

Grades

The grade Pass (G) or Fail (U) is given in this course.

To receive a passing grade, the student must complete all practical exercises with approved results.

Types of assessment

Assessment will be done through the practical sessions; these are design to test the understanding of the different applications, so completion of all of them is mandatory for a

passing grade. Active participation during group sessions and attendance for at least 80% is also mandatory.

Student has the right to change examiner after having failed twice on the same examination, unless special reasons speak against it. (HF 6 Chapter 22 §). Such a request is made to the institution and must be in writing.

Course evaluation

The course evaluation will be done through a written questionnaire, available at the virtual learning environment, where students are asked to describe their opinions on the various stages of the course for future development.

The results of and possible changes to the course will be shared with students who participated in the course and students who are starting the course next term.

Other information

Computer access with administration rights as well as internet access is required since all communication concerning the course and relevant documents, such as lectures, exercises and literature, will be posted at the virtual learning environment.