



## CORE FACILITIES

### SC00032 Python programming applied to research, 2.5 credits

Python programming applied to research, 2,5 högskolepoäng

*Third-cycle level / Forskarnivå*

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#### Confirmation

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-03-14, and is valid from Spring semester 2019.

#### *Responsible Department*

Core Facilities, Sahlgrenska Academy

#### Entry requirements

Admitted to PhD education. In order to be admitted to the course you should have a background in genetics, cell biology, biomedicine, biochemistry, bioinformatics or similar.

#### Learning outcomes

On successful completion of the course, the PhD student is expected to be able to:

##### Knowledge and understanding

- 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

##### Skills and ability

- 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 topics covered are:

- 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 consists of lectures, practical sessions and self-studies.

### *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 is required to complete all practical sessions and demonstrate that the learning objectives have been reached.

## Types of assessment

Assessment will be done through the practical sessions; these are designed to test the understanding of the different applications, so completion of all of them is mandatory. Active participation during group sessions and attendance for at least 80% is also mandatory.

A doctoral student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the Institute.

## Course evaluation

The course evaluation will be done through a written questionnaire, available at , where students will be asked to describe their opinions on the various stages of the course for future development. This information will be compiled and shared with students who participated in the course. Improvements are shared with students participating in the next emission of the course.

## Other information

Computer access and internet 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 (GUL).

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 28-08-2018 and is valid from the spring semester 2019 (reg.nr.: U 2018/457). It was entered into FUBAS on 31-01-2019.