CORE FACILITIES

UNIVERSITY OF
GOTHENBURG

SC00035   R programming, 2 credits

R programmering, 2 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-09-18, and was last revised on 2020-09-23. The revised course syllabus is valid from Spring semester 2021.

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 analyze different sets data using R.

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:

Knowledge and understanding

- Interpret simple R scripts
- Describe and summarize basic statistics used in data analysis
- Define suitable data analysis workflows
- Evaluate the main variables in the experimental design of a project

Competence and skills

- Use (fundamental) commands in R for data manipulation, statistical tests, and plotting graphs and diagrams
- Write R code as a script

- Use and when needed modify existing R scripts
- Use help pages to understand commands and solve problems
- Use web resources such as CRAN and Bioconductor to install suitable packages

Judgement and approach

- Design and establish custom approaches for analyzing, visualizing and interpreting data
- Translate simple research questions of interest into appropriate R workflows
- Formulate how R scripts can be created according to the data analysis workflow
- Assess which factors are important to consider for a well-designed experiment

Course content

The course covers:

- Introduction to R programming and scripting
- Experimental design
- Introduction to statistical analysis in R
- Visualization in R

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.