



CORE FACILITIES

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 is valid from Spring semester 2020.

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

This is a hands-on course that introduces the statistical software R. You will learn to analyze data and visualize the results. The course includes a combination of lectures and practical sessions.

The course covers:

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

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.

Rating scale: Fail (U), Pass (G). 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 computer home assignment; these are designed to test if the learning objectives are reached, so completion of them is mandatory for a passing grade.

Attendance of at least 80% of the lectures and practical sessions is also mandatory.

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. This information will be compiled and shared with

students who participated in the evaluations. Improvements are shared with students participating in the next emission of the course

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

Scientific papers and handouts will be provided during the course