UNIVERSITY OF GOTHENBURG

INSTITUTE OF MEDICINE

STA050 R programming with examples from health sciences, 7.5 credits

R programmering med exempel från hälsovetenskaper, 7,5 högskolepoäng
Second Cycle

Confirmation

This course syllabus was confirmed by Institute of Medicine on 2023-02-15 to be valid from 2023-08-28, autumn semester of 2023.

Field of education: Medicine 100%
Department: Institute of Medicine

Position in the educational system

The course is offered as a freestanding course on advanced level, targeting students of health sciences, social science, science, economics, engineering, or similar, with an interest in learning analysis of data using the R programming language. Examples in the course are mainly from the health sciences.

Main field of studies	*Specialization*
-	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

The entry requirements are at least 120 credits and English B/English 6. A previous course in statistics is not mandatory but advisable.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- Describe the most common data types and objects, as well as common file formats for

R scrips and data

- Explain how to install and update packages

- Describe how to find and use documentation on R functions and packages

- Give examples of standard functions and common packages for statistics and visualizations

Competence and skills

- Write R scripts and user-defined functions

- Use R to import data from typical external data formats

- Process and transform data in R by converting table formats and calculating new variables

- Perform statistical analyses using R

- Summarize and present results as informative tables and figures using R

Judgement and approach

- Critically discuss the use of open-source statistical software

- Choose approaches to develop scripts for comprehensible and reproducible analysis, including for example documentation, naming convention, code layout and use of functions

Course content

The course is focused on introducing the statistical programming language R as a tool to perform reproducible statistical analyses. Statistical programming is an essential skill in order to work with data analysis, including statistical analyses and machine learning, and AI. In the health sciences, R has evolved as a key tool for managing and analyzing data.

The scope of the course ranges from importing data, processing and tidying data, transforming and manipulating data, performing statistical analyses, and summarizing and visualizing the results. You will learn the basic concepts of the R programming language such as data types and structures, control statements, and writing functions and reproducible code.

Throughout the course, we will predominantly use examples from the health sciences.

The course teaches how to perform statistical analyses; however, the statistical methods are not described in detail.

Form of teaching

Teaching is online only and consists of a mixture of pre-recorded material and live online lectures, workshops, and computer exercises. The teaching takes place on digital platforms.

Language of instruction: English

Assessment

Four mandatory computer assignments, presented in writing and orally.

If a student has failed the same examined component twice and wishes to change examiner before the next examination, such a request should be made to the department in writing and should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that the course has ceased or undergone major changes, students are to be guaranteed at least three examination rounds (including the ordinary examination during the course) over a period of at least one year, but no more than two years after the course has ceased/been changed.

Grades

The grading scale comprises: Pass (G) and Fail (U).

Course evaluation

The course evaluation is carried out in the form of an anonymous questionnaire. A compilation of the questionnaire is done by the course coordinator. The result and potential changes should be shared with both the students who carried out the evaluation and the students that are about to start the course.

Additional information

A computer with internet, webcamera and a microphone, and with the possibility to install R and RStudio, is necessary to be able to follow the course.