DEPARTMENT OF MICROBIOLOGY, TUMOR AND CELL BIOLOGY

C1F5626, Basics of Programming for Biomedical and Clinical Research, 3 credits (hec)

Grundläggande programmering för biomedicinsk och klinisk forskning, 3 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus is approved by the The Committee for Doctoral Education on 2023-12-21, and is valid from Spring semester 2024.

Responsible department

Department of Microbiology, Tumor and Cell Biology, Faculty of Medicine

Prerequisite courses, or equivalent

No prerequisite courses, or equivalent, demanded for this course.

Purpose & Intended learning outcomes

Purpose

To give students theoretical knowledge about programming, introduce widely used programming techniques and give practical experience in solving real-world research problems using programming languages widely spread in academia. The course requires no programming experience. Minor experience with any programming language or data analysis is an advantage.

Intended learning outcomes

After the completed course, the participants will be able to solve programming problems in research process: pick the appropriate method of decomposition, create algorithms and data structures, implement the created algorithms using R/Python programming language, write maintainable and reusable code, visualise data, work in group with other programmers and prepare code for publishing. Theoretical knowledge obtained during the course will help students to continue improvement of their programming skills either themselves or through other courses.

Course content

Programming techniques, types of problem decomposition, functional programming, object-oriented programming, modular code, data import and export, data visualisation, parallel programming.

Forms of teaching and learning

The course consists of lectures, hands-on labs (individual and group).

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

The practicals and group works are mandatory. Absence has to be compensated according to the instructions of the course director.

Forms of assessment

The participants will be examined by completed individual laboratory practicals and the final project report.

Course literature

Course relies on classical literature in computer science as well as modern interactive resources.