SM00105 Reproducibility in Medical Research, 3 credits
Reproducerbarhet inom medicinsk forskning, 3 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation
This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-03-21, and is valid from Autumn semester 2019.

Responsible Department
Institute of Medicine, Sahlgrenska Academy

Entry requirements
Registrerad PhD students are eligible to be admitted to the course.

Learning outcomes
After completing the course the student is expected to be able to / to have:

Knowledge and understanding
• understand the rationale and benefits of implementing reproducibility in medical research.

Skills and ability
• to plan aspects of reproducibility in their own research work and implement algorithms for undertaking reproducibility when publishing their scientific work.

Judgement and approach
• to identify and critique aspects of reproducibility in any medical research work.

Course content
• Fundamental principles of medical research and its benefits to the society
• Key concepts: reproducibility, replication; ‘reproducibility crisis’
• Causes of irreproducible medical research
• Case studies of irreproducible research: research frauds, misconducts, and data fabrications
• Rationale, benefits, and challenges of reproducibility in medical research
• Seminar and discussion forums: global best practices on reproducibility in medical research
• Key steps and tools to implement reproducibility:
  o Steps and tools at stage of study design
  o Steps and tools at study implementation
  o Steps and tools at data analysis and reporting of results
  o Exemplar of reproducibility in medical research
  o Case studies: critiquing aspects of reproducibility in medical research
• Computational algorithms to reproducible medical research.

Types of instruction

• Lectures
• Computer lab sessions
• Group discussions/seminars
• Analysis of case studies

Language of instruction
The course is given in English.

Grades
The grade Pass (G) or Fail (U) is given in this course.

Types of assessment
During the course, students will be assigned to groups of 4-5 students per group and each group will work on a reproducible research project to be undertaken during the lab sessions of the course. An individual project will be assigned to each student to be submitted and graded at the end of the course. To pass the course, a student must attend at least 75% of class meetings and labs, actively participated in the group works, and submitted the individual project.

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 students will be asked to fill in a form to evaluate the course's different aspects.

Other information
Requested readings: see a separate list.

This syllabus was confirmed by the Sahlgrenska Academy's Council for PhD Education on 26-02-2019, and is valid from the autumn semester 2019 (reg.nr.: GU 2019/697).