



DEPARTMENT OF CLINICAL NEUROSCIENCE

K8F6069, Open Science and Reproducible Research, 1.5 credits (hec)

Öppna och reproducerbara forskningspraktiker, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2025-02-18, and is valid from autumn semester 2025.

Responsible department

Department of Clinical Neuroscience, Faculty of Medicine

Prerequisite courses, or equivalent

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

Purpose & Intended learning outcomes

Purpose

This course will equip you with knowledge and skills to assess and improve the reproducibility and transparency of your research. Through varied interactive sessions, you will be encouraged to take a deep look into the methods, reporting, and incentives in your research field.

The course is intended for PhD students in any medical, biomedical, or adjacent field. In a combination of overview lectures with interactive group sessions, you will find a stimulating learning environment whether you are entirely new to open science and meta-research or an aspiring champion.

Intended learning outcomes

Through this course, you will learn how to:

- Analyze challenges to research reproducibility and problematize reasons for non-replication of study results
- Identify questionable research practices, including questionable statistical inference methods and selective reporting

- Preregister research protocols in a place suitable for your research
- Assess others' preregistered research protocols and demonstrate strategies to locate results of studies (e.g., at clinical trial registries)
- Openly share scientific works including data and code, and find and make use of data and code published by others
- Evaluate your use of open science practices and integrate best practices into your research
- Analyze researchers' incentives (e.g., promotion criteria) and their potential impact on research reproducibility

Course content

- Introduction to the "reproducibility crisis"
- Open access publishing
- Open materials, open data, and open code
- Reasons for non-replication of study results, including analytical flexibility
- Questionable research practices and selective reporting
- Preregistration of research protocols
- Locating results of preregistered studies and assess the reporting
- Observed statistical power and implications for inference
- Open science from a low-and middle income country (LMIC) perspective
- Initiatives to improve research transparency and reproducibility

Forms of teaching and learning

This course emphasizes active learning, with seminars, workshops, and interactive group work. Every concept will be introduced and situated in context in overview lectures. In literature seminars, you will practice critical appraisal of the course literature and engage in problematizing discussions.

Workshops will cover computer-assisted exercises in statistical power, preregistration, and open materials. In parallel, you will collaborate in a small group to create an online diary with daily take-home messages and reflections. On the last day of the course, you will demonstrate your knowledge and skills in a Peer Instruction examination.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Participation in the literature seminars and examination sessions is mandatory. Absence from a seminar may be compensated by writing a concise reflection paper on the literature for that

seminar. Contribution to the group diary is also expected.

Forms of assessment

The examination will consist of an interactive Peer Instruction session with four steps:

- Preliminary Response: Students answer multiple-choice questions individually.
- Group Discussion: Students discuss their answers in small groups to explore different perspectives.
- Final Response: Students submit their answers again after the discussion.
- Class Review: The instructor leads a review session to illustrate different perspectives and clarify doubts.

Course literature

Scientific papers, book chapters/excerpts, and online scientific presentations to be provided by the course organizers.

Other information

Replacing course K8F2963 (3 HEC).