SK00009  Program for Doctoral Students in Clinical Research with clinical epidemiological methods, course 1, 7.5 credits

Forskarfakultetet  Klinisk forskning med klinisk epidemiologisk metodik, kurs 1, 7,5 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-01-29, and is valid from Spring semester 2019.

Responsible Department

Institute of Clinical Sciences, Sahlgrenska Academy

Entry requirements

- Admitted to postgraduate education.
- To be eligible for the course the student has to be registered in Third Cycle at the Sahlgrenska Academy or at another faculty or university. The student also has to be admitted to Research school Clinical research employing clinical epidemiologic methodology.

Learning outcomes

On successful completion of the course, the PhD student is expected to be able to:

Knowledge and understanding

- Understand the conceptual basis of methods in clinical epidemiology
- Conceptually understand measures of incidence and measures of relationship
- Demonstrate knowledge about and be able to engage in discussion of different types of bias as well as confounding and to understand how these mechanisms arise
- Demonstrate knowledge about the principles governing the design of different types of studies in clinical research including descriptive (case studies, case series, prevalence studies) and analytical studies (randomized clinical trials, cohort and case-control studies)
- Demonstrate a capacity for discussing theoretical concepts such as testing of hypotheses
and causality
- Explain the philosophical assumptions underlying science
- Display insight in how knowledge is developed within a clinical field (theory construction)
- Demonstrate a general knowledge of ethics in research as well as an independent ability to reflect on and critically discuss ethical issues concerning one's own research field as well as research in general
- Present an overview of Swedish laws and statutes governing ethics in research
- Explain the rules and norms governing authorship and the implications of the Copyright Act as concerns the publication of scientific data
- Demonstrate knowledge about the quality and content of different sources
- Explain the structure of scientific information and the organization of various types of information sources
- Demonstrate knowledge about the constituent parts of an application for research ethics approval
- Demonstrate knowledge about the University of Gothenburg’s rules and guidelines concerning plagiarism and academic authorship
- Display insight into bibliometric measures (author and journal citation frequency, citation frequency norms within the research field) of publication and their use for evaluation of research productivity.
- Demonstrate knowledge about common reference management software
- Display good insight into the role of statistics in clinical research
- Display familiarity with the principles of basic probability theory and probability distributions
- Demonstrate knowledge about and understand the principles of hypothesis testing, p values and confidence intervals, statistical power and sample size.

**Competence and skills**
- Formulate a hypothesis for a clinical study
- Define basic concepts in quantitative medical research such as incidence, different types of person-time, prevalence, sensitivity, specificity, degree of evidence, effect modification and generalizability
- Calculate measures of incidence and measures of relationship
- Reflect on and present an argument for the application of various qualitative research methods
- Search for information in hard-copy and digital collections, catalogues and other bibliographic tools as well as develop search strategies
- Demonstrate capability of finding published literature relevant to a formulated hypothesis
- Manage and structure the information collected
- Employ basic biostatistical calculations such as determination of mean value, median value and proportions, create frequency tables and perform basic parametric and non-parametric tests
- Employ statistical software to make basic computations.

**Judgement and approach**
- Formulate a hypothesis about a clinical effect. This includes having an understanding of the qualitative research process that always precedes the definition of the causal factor (for
example a clinical intervention or the symptoms of an illness) that is specified and of its possible effects (including patient-focused measures of outcome)

- Discuss the possibilities and limitations of science, the formulation of ethical issues, and the role of science in society
- Reflect on gender and cultural aspects of health-related scientific research and development
- Critically examine the information obtained as well as the search process per se.

**Course content**

The course comprises four sections:

- Research methods in clinical epidemiology
- Scientific theory and ethics in clinical research
- Information search and retrieval
- Biostatistics including exercises employing interactive software designed for statistical analyses.

**Types of instruction**

Lectures, group work

**Language of instruction**

The course is given in Swedish.

The language of instruction is Swedish, if, however, the lecturer is English-speaking the language of instruction will be English. Some of the required reading will be in English.

**Grades**

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

The following is required of the student to pass the course:

- Passed written examination
- Passed oral presentation
- One hundred percent attendance and active engagement in group seminars, group assignments as well as information searching and biostatistical laboratory activities.

In the case of absence due to illness or strong personal reasons, the student is to complete the course according to instructions given by the course director.

**Types of assessment**

Performance in the course is evaluated on the basis of written reports, examinations, and on an individual evaluation of each participant’s performance in presenting an oral report. Active participation is expected at every stage in the course.

A student who has failed a test twice has the right to change examiner, if possible. A written application should be sent to the relevant institution.
**Course evaluation**

Evaluation of the course is achieved through the use of individually written evaluations presented anonymously along with a general discussion at the end of the course. The overall results will be communicated to the students in writing and will function as a guide for the development of the course.

**Other information**

This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 15-09-2015 and was last revised on 28-08-2018. The revised course syllabus is valid from spring term 2019 (reg.nr.: U 2018/457). It was entered into FUBAS on 22-01-2019.