



INSTITUTE OF MEDICINE

MPH221 Epidemiology and biostatistics, 15 credits

Epidemiologi och biostatistik, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Institute of Medicine on 2019-11-04 and was last revised on 2020-10-30 by Sahlgrenska Academy to be valid from 2021-01-18, spring semester of 2021.

Field of education: Medicine 100%

Department: Institute of Medicine

Position in the educational system

The course is a compulsory course within the Master's Programme of Public Health.

The course can also be offered as a freestanding course on advanced level.

The course can be part of the following programme: 1) Master's Programme in Public Health Science (M2PHP)

Main field of studies

Public Health Sciences

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

A Bachelor's degree or professional degree qualification corresponding to at least 180 credits or equivalent, within the main areas of health science or social science.

Applicants must prove their knowledge of English: English 6/English B from Swedish Upper Secondary School or the equivalent level of an internationally recognized test, for example TOEFL, IELTS.

Learning outcomes

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

Knowledge and understanding

- Describe key concepts and method models for various epidemiological applications, and their strengths and weaknesses.
- Describe statistical methods and their application in public health research.
- Identify different data structures (e.g. types of variables and levels of measurement) and distribution characteristics of variables, and distinguish between the concepts descriptive and inferential statistics.

Competence and skills

- Synthesize and present epidemiological investigation within a specified public health field and identify potential knowledge gaps for prospective epidemiological studies.
- Analyze epidemiological research including various methodologies, ethics and scientific theoretical perspectives
- Individually conduct appropriate statistical analysis using statistical programs (software), interpret and present results in a scientific manner in writing.
- Compile and present scientific and practical relevance of specific epidemiological research for diverse stakeholders

Judgement and approach

- Critically analyze epidemiological research from methodological and ethical perspectives, orally and in writing.
- Judge public health research on the basis of scientific relevancy and quality, and reflect on the strengths and limitations of different methodological approaches.

Course content

The course focuses on two main components in public health science, biostatistics and epidemiology. Competence in these areas is fundamental to both fields of specialization; health economics and health equality.

Biostatistics includes application of statistics within public health science to the collection, summarization, and analysis of data as well as the interpretation and conclusion of the results. During this course, the students will learn how to collect, manage, and visualize different types of data, and to understand and apply appropriate biostatistical concepts and methods such as probability distributions, estimation and confidence intervals, hypothesis testing and regression, that are relevant to different study areas. In order for students to be able to build practical skills in statistics and analysis, compulsory computer labs with statistical software are maintained throughout the course.

Epidemiology is the study of the distribution and determinants of health-related states and events in defined populations. In this course, students will learn to understand the

principles, methods, strengths and limitations of epidemiologic study designs and will attain how to plan for public health scientific research and interpret epidemiologic findings. They will also understand how to effectively communicate research to lay and professional audiences, and apply the findings to the development of epidemiological studies.

Finally, the course prepares for more advanced courses in biostatistics and epidemiology and it gives students the opportunity to start planning and developing research questions for their upcoming thesis.

Form of teaching

Lectures, seminars, computer labs, individual work, and group work.

Language of instruction: English

Assessment

The course will be examined through:

1. An individual computer-based biostatistics exam, which includes statistical concepts, analysis of data, interpretation and conveying the results in writing.
2. An individual written epidemiology exam, covering epidemiological concepts and applications taught in this course.
3. Eight mandatory computer labs with focus on biostatistics and one mandatory seminar.

Absence from the compulsory seminar or any of the compulsory computer labs should be supplemented through written assignments in accordance with course leader's instructions.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

A student who has failed the course has the right to be examined in a future offering of the course following the syllabus and course literature applicable at that time. In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

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For the grade Pass (G), the student must have achieved a Pass (G) on the computer-based biostatistics exam, the written epidemiology exam and on all the compulsory elements in the course.

To pass with distinction (VG) for the entire course, the student must have achieved a Pass with Distinction (VG) on the computer-based biostatistics exam, a VG on the written epidemiology exam and a Pass (G) on all the compulsory elements in the course (computer labs and the seminar).

Course evaluation

The course evaluation is carried out in writing and orally with the students. The course leader is responsible for analyzing the evaluations and giving propositions for improvement. The analysis and propositions of development is shared with the students through the program council and the learning platform. The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.