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 2022-10-24 by Committee for Study Programmes in Medicine to be valid from 2024-01-15, spring semester of 2024.

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	*Specialization*
Public Health Sciences	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

Qualification for admission to the course requires professional degree/Bachelor's degree of at least 180 credits in a health science, social science, science, economics, arts or engineering field of education and grade Passed/E in English B/English 6.

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

- Synthetize 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:

> An individual computer-based biostatistics exam, which includes statistical concepts, analysis of data, interpretation and conveying the results in writing.
> An individual written exam, covering epidemiological and biostatistical concepts and applications taught in this course.
> 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.

A student who has taken two exams in a course or part of a course without obtaining a pass grade is entitled to the nomination of another examiner. The student needs to contact the department for a new examiner, preferably in writing, and this should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for special educational support, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, the examiner may decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years, after the course has ceased/been changed. The same applies to placements and professional placements

(VFU), although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
For the grade Pass (G), the student must have achieved a Pass (G) on the computer-based biostatistics exam, the written exam and on all the compulsory elements in the course (computer labs and the seminar).

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 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.