UNIVERSITY OF GOTHENBURG

INSTITUTE OF MEDICINE

MGH311 Applied Epidemiology and Biostatistics, 7.5 credits

Tillämpad epidemiologi och biostatistik, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Institute of Medicine on 2024-03-14 to be valid from 2024-09-02, autumn semester of 2024.

Field of education: Medicine 100%
Department: Institute of Medicine

Other participating departments
School of Global Studies
Department of Economics
Department of Social Work
Department of Literature, History of Ideas, and Religion

Position in the educational system

The course is included in the master's program for global health and is given in semester 3.

The course can be part of the following programme: 1) Master's Programme in Global Health (V2GLH)

Main field of studies	*Specialization*
Global Health	A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements

To be admitted to the course, the student must have obtained approved results in MGH101 Global Health Challenges in an Interdisciplinary Context, 15 credits and MGH102 Quantitative and Qualitative Methods, 15 credits.

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

Knowledge and understanding
- describe quantitative research methods to answer the questions of “who, when, where, and why” in the context of studies of the distribution and determinants of health and disease;
- describe the concepts of 'surveillance' and 'time and space' in epidemiology and their application in the context of spatial and temporal patterns of health and disease;
- explain the theoretical frameworks used to understand the determinants of health;
- define the concept of causality, understand different types of causation, explain counterfactual thinking for causal inference and interpret causal diagrams

Competence and skills
- evaluate the quality of available surveillance data and apply methods to analyse and visualise the spatial and temporal data;
- argue for the relevance of the concept of social explanatory factors and apply an intersectional approach to identify patterns, drivers and intervention points to address health and disease;
- apply the causal framework to understand the association between health factors and health outcomes, and analyse causal diagrams;

Judgement and approach
- assess the scientific quality of research articles with a focus on scientific rigour and potential bias based on the formulation of research questions, choice and application of analytical methodology, interpretation of results and practical implications of research findings for policies and interventions;
- reflect on the ethical implications of choosing irrelevant methods, using biased data and misinterpreting research results.

The course is sustainability-related, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

Course content
This applied quantitative course aims to introduce a broad range of relevant methods that can be used in quantitative research to address the questions of when, where, who and why in the context of studying the distributions and determinants of health and

disease. For public health workers at different levels, the skill to answer the question when, where, who and why is important. For example, in research on infectious disease epidemiology, health authorities and researchers react to the disease outbreak (an epidemic) by mapping the epidemic curve (when), areas most or least affected (where), populations in vulnerable contexts impacted by the outbreak (who), and the reasons behind a specific time and place distribution and population affected (why). The same logical framework could be applied to understand other health problems, such as the obesity epidemic, the increase in mental health issues and suicides, the persistence of underweight and stunting in certain countries, teenage pregnancies, the re-emergence of dengue fever, the impacts of conflicts or disasters on population health, etc.

Students will learn the basic concept of each method, its utility, and its application in quantitative research. At the same time, students will practice applying the methods at an introductory level in computer sessions and discuss how to critique and interpret the analysis and results and their relevance to policies and interventions. The course covers a wide range of epidemiological and biostatistical methods, giving students a good opportunity to further deepen their knowledge and skills in the future.

Form of teaching

The central part of the course consists of in-class lectures with interactive discussion, critical paper reading, data analysis computer exercises, and seminars.

Language of instruction: English

Assessment

The course is examined based on the following:

Seminars (4 sessions x 0.75 hp)

Individual written examination (4.5 hp)

The seminars are compulsory; students who cannot attend the seminar must submit a supplementary assignment.

Any student who has failed the same examined component twice may apply to change examiner before the subsequent examination. A written application shall be sent to the department responsible for the course. It shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of the Higher Education Ordinance).

In cases where a course has been discontinued or has undergone significant changes, the student shall generally be guaranteed at least three re-examining opportunities (including the regular examination) during a period of at least one year, but no longer than two years after the course has ceased/changed.

If a student has received a recommendation from the University of Gothenburg for special pedagogical support, the examiner may, in cases where it is compatible with the course objectives and provided that no unreasonable resources are required, decide to give the student an adapted examination or alternative form of examination.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
The final grading scale comprises Pass with Distinction (VG), Pass (G), and Fail (U), assessed based on the individual written examination. The seminars are graded as Pass (G) and Fail (U). Students must pass all the seminars to pass the course.

Course evaluation

Course evaluation takes place in written format and orally in dialogue with the students and course coordinator. The course coordinator compiles the analysis of course evaluation and provides suggestions for course development. Analysis and suggestions are shared with the students. The results and any changes to the course structure are communicated both to the students who carried out the evaluation and to the students who start the course.