Course syllabus for

Scientific methodology and statistics, 7.5 credits

Vetenskaplig metodik och statistik, 7.5 hp
This course syllabus is valid from autumn 2025.
Please note that the course syllabus is available in the following versions:
Autumn2023 , Autumn2025

Course code	3BL001
Course name	Scientific methodology and statistics
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedical Laboratory Science
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Laboratory Medicine
Decided by	Education committee LABMED
Decision date	2023-03-27
Revised by	Education committee LABMED
Last revision	2024-10-07
Course syllabus valid from	Autumn 2025

Specific entry requirements

Completed biomedical laboratory science education and Degree of Bachelor of Science in Biomedical Laboratory Science about 180 credits or Bachelor's degree in biomedical laboratory science. In addition, proficiency in Swedish and English equivalent to Swedish B/Swedish 3 and English A/English 6.

Objectives

The overall aim of the course is to deepen the knowledge of the scientific methodology. This includes how to formulate research questions and how to choose and apply appropriate statistical models in pre-clinical or clinical settings.

KNOWLEDGE AND UNDERSTANDING

- Show advanced knowledge and understanding of how to select and implement statistical methodology and show an understanding of research and development principles.

SKILLS AND ABILITIES

- Demonstrate the ability to integrate knowledge, to analyse and address a clinical research question
- Demonstrate the ability to clearly explain and discuss a scientific approach and the knowledge and arguments that underlie it in dialogue with different groups orally and in writing
- Demonstrate the ability to extract relevant information from scientific literature and summarise in a written format
- Demonstrate the ability to independently formulate a scientific question and design a study, identify relevant primary and secondary outcome measures, calculate sample size, choose adequate methodology and relevant statistics
- Demonstrate skills required to contribute to research and development work and to complete qualified tasks within given time frames

VALUES AND PERSPECTIVES

- Demonstrate the ability to asses relevant scientific and ethical aspects as well as awareness of ethical considerations within research and development
- Demonstrate self awareness and individual responsibility with regards to knowledge development

Content

The course content builds on basic knowledge of scientific methodology and statistics that has been received within the scope of relevant undergraduate programme.

Study design, primary and secondary outcome measures in clinical assessments, statistical approach and organisation of data. Ethical considerations in medical research.
Statistical methods including descriptive statistics, hypothesis testing, parametric and non-parametric statistics, calculation of sample size and epidemiology.
The possibilities and limitations within science, its role in society and how it should be implemented responsibly

Teaching methods

The teaching and learning will be based on student-centred and student-activated learning.

The teaching consists of lectures, self tests and practical work with scientific writing, workshops and seminars.

Examination

A passing grade requires full filled written assignments, peer review, oral presentation and passed final written examination. The final examination is graded Fail/Pass/Pass with distinction and determines the final grade.

Students who do not pass a regular examination are entitled to re-sit the examination on five more occasions. If the student has failed six examinations/tests, no additional examination is given. Each occasion the student participates in the same test counts as an examination. Submission of a blank exam paper is regarded as an examination. In case a student is registered for an examination but does not attend, this is not regarded as an examination.

In the event of special circumstances, or if a student with a disability is in need of certain adjustments, the examiner may decide to depart from the syllabus' regulations on examination form, number of examination opportunities, possibility of completion or exemption from compulsory educational

elements, etc. Content and intended learning outcomes as well as the level of expected skills, knowledge and abilities must not be altered, removed or lowered.

The examiner decides if, and how, absence from compulsory parts can be compensated. Study results cannot be reported until the student has participated in compulsory course elements or compensated for any absence in accordance with instructions from the examiner. Absence from a compulsory educational component may mean that the student cannot take the opportunity until the next time the course is given.

Transitional provisions

For a course that has been discontinued, undergone major changes, or where the reading list has been significantly changed, an additional exam (other than the regular exam) of the previous content or literature should be conducted for a period of one year from the date the change took place.

Other directives

The course is given in Swedish and English. Course evaluation is carried out according to the guidelines that are established by the Committee for higher education

Literature and other teaching aids

Machin, David; Campbell, Michael J.; Walters, Stephen John

Medical statistics : a textbook for the health sciences

4th ed. : Chichester : Wiley, 2007 - xii, 331 p.

ISBN:0470976632 (e-book) LIBRIS-ID:13605721

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