



**Karolinska  
Institutet**

Course syllabus for

# **Scientific Methods, Statistics and Quality Assurance, 7.5 credits**

Vetenskaplig metodik, statistik och kvalitetssäkring, 7.5 hp

This course syllabus is valid from autumn 2022.

Please note that the course syllabus is available in the following versions:

Autumn2016 , Autumn2017 , Autumn2021 , Autumn2022

Course code	3DC000
Course name	Scientific Methods, Statistics and Quality Assurance
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Diagnostic Cytology
Level	AV - Second cycle
Grading scale	Fail (U) or pass (G)
Department	Department of Laboratory Medicine
Decided by	Utbildningsnämnden Labmed
Decision date	2016-05-13
Revised by	Education committee LABMED
Last revision	2022-03-15
Course syllabus valid from	Autumn 2022

## **Specific entry requirements**

Degree of Bachelor of Science in Biomedical Laboratory Science of 180 hp credits from education with Specialization Laboratory Medicine or the equivalent. Or completed biomedical laboratory science education with Specialization Laboratory Medicine and Degree of Bachelor in biomedical laboratory science. In addition, proficiency in Swedish and English equivalent to Swedish B/Swedish 3 and English A/English 6.

## **Objectives**

The general aim of the course is that the student should develop their knowledge in scientific methodology, statistics and quality assurance as preparation before the degree project in the main field of study diagnostic cytology at second cycle level. The course also intends to develop a scientific approach which includes ability to perform independent analysis, reflection and critical assessment.

### **Knowledge and understanding**

On completion of the course, the student should be able to:

- Relate scientific and statistical analytical methods to cytologic research
- Analyse and synthesise scientific information and be able to discuss complex scientific contexts
- Reflect on quality indicators and quality assurance in diagnostic cytology
- Relate factors such as gender, age, ethnicity and socioeconomic status to scientific production and ethical assessments of specific scientific issues

### **Skills and abilities**

On completion of the course, the student should be able to:

- Interpret, review and critically evaluate scientific articles, mainly within the field of cytology,
- Apply statistical analytical methods related to research in cytology
- Make research-ethical assessments of specific scientific issues
- Plan, write and present a research plan
- Discuss the current research in a cytologic subject area and be able to give proposals on appropriate collaborative project with patient-bedside healthcare to stimulate translational research
- Discuss scientific articles and issues orally and in writing

### **Values and perspectives**

On completion of the course, the student should be able to:

- Show an ethical and professional attitude
- Demonstrate an understanding of the possibilities and limitations of the science
- Demonstrate an understanding of how activities and cooperation can see out for colleagues in the profession diagnostic cytology different countries and resource settings globally

## **Content**

The course is divided in three modules.

### **Statistics, 3.0 hp**

Grading scale: GU

The course segment Statistics covers methods for statistical analyses, relevant for diagnostic cytology.

### **Scientific methods, 2.5 hp**

Grading scale: GU

The course segment Scientific methods concerns scientific principles and ethical aspects of science on a deeper level, and creates awareness of an ethical and professional attitude.

### **Quality assurance and Project plan, 2.0 hp**

Grading scale: GU

The course segment Quality assurance and Project plan focuses on principles for quality assurance and applied methods for quality assurance in diagnostic cytology. The segment also includes writing a project plan suitable for a degree project.

## **Teaching methods**

The course contains varying working methods consisting of lectures, demonstrations, Journal Clubs, seminars and student-activating discussion seminars and group work that stimulate to cooperation

between different professional groups and facilitate interprofessionell cooperation.

## Examination

Oral or written presentations and written assignments.

Part 1 - Statistics Be assessed through a written examination and a written assignment. Grade Fail/Pass

Part 2 - Scientific methodology Be assessed through oral presentation, written assignment and discussion seminars. Grade Fail/Pass

Component 3 Quality assurance: Be assessed through oral presentation, written submission of project plan and discussion seminars. Grade Fail/Pass

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.

### Compulsory participation

Seminars, the Ethics days and all Journal Clubs have compulsory attendance. The examiner assesses if, and in that case how, absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results for respective part will not be registered. Absence from a compulsory activity may result in that the student cannot compensate the absence until the next time the course is given.

If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus's regulations on the examination form, the number of examination opportunities, the possibility of supplementation or exemptions from the compulsory section/s of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities may not be changed, removed or reduced.

## Transitional provisions

The course will be offered for the last time in the autumn semester of 2022/spring semester of 2023 and will then be cancelled. Examination will be provided until the spring of 2024 for students who have not completed the course. Information about the examination date will be provided on the course web.

## Other directives

Some teaching may be in English.

A course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

## Literature and other teaching aids

*Nilstun, Tore; Lundqvist, Anita; Löfmark, Rurik*

### **Vetenskapsteori i medicin och klinik**

1. uppl. : Lund : Studentlitteratur, 2007 - 127, [1] s.

ISBN:978-91-44-03461-4 LIBRIS-ID:10414475

URL: [Omslagsbild](#)

[Library search](#)

*Wallén, Göran*

## **Vetenskapsteori och forskningsmetodik**

2. uppl. : Lund : Studentlitteratur, 1996 - 151 s.

ISBN:91-44-36652-3 LIBRIS-ID:8353602

[Library search](#)

*Bergman, Bo; Klefsjö, Bengt*

## **Kvalitet från behov till användning**

5., uppdaterade och utök. uppl. : Lund : Studentlitteratur, 2012 - 702 s.

ISBN:978-91-44-07825-0 (inb.) LIBRIS-ID:13540471

[Library search](#)

*Forsman, Birgitta*

## **Forskningsetik**

Studentlitteratur AB, 2010

ISBN:978-91-44-06350-8 LIBRIS-ID:11909240

URL: [Omslag och förlagets beskrivning](#)

[Library search](#)

*Bring, Johan; Taube, Adam; Wikman, Per*

## **Introduktion till medicinsk statistik**

2., utök. uppl. : Lund : Studentlitteratur, 2015 - 233 s.

ISBN:9789144104270 LIBRIS-ID:18062641

[Library search](#)