



Course syllabus

Faculty of Health and Life Sciences

Department of Chemistry and Biomedical Sciences

2BL004 Fördjupad laboratoriemetodik, 7,5 högskolepoäng

2BL004 Advanced Laboratory Methodology, 7.5 credits

Main field of study

Biomedical Science, Biomedical Laboratory Science

Subject Group

Biomedical Laboratory Science

Level of classification

First Level

Progression

G2F

Date of Ratification

Approved 2009-08-19

Revised 2015-11-03 by Faculty of Health and Life Sciences.

The course syllabus is valid from spring semester 2016

Prerequisites

Chemistry 30 credits (including Biochemistry 7.5 credits, Biochemical Laboratory Methodology 7.5 credits), Cell and Molecular Biology with Laboratory Methodology 15 credits, Anatomy and Physiology with Fundamental Clinical Laboratory Methodology 15 credits, Clinical Immunology with Laboratory Methodology 7.5 credits, Clinical Microbiology with Laboratory Methodology 7.5 credits, Clinical Pathology with Laboratory Methodology 7.5 credits, Hematology with Laboratory Methodology 4.5 credits, Pharmacology and Toxicology with Laboratory Methodology 7.5 credits, or the equivalent.

Objectives

After completing the course, the student should be able to:

- explain the organisation and composition of the genetic material in eukaryotes, primarily focusing on the human genome
- present some common genetic diseases, their mechanisms of onset, and how they are diagnosed
- describe immunological and molecular biology methods for typing bacteria and viruses
- present methods used in molecular biology, cytogenetics, and molecular

- cytogenetics, along with their clinical applications
- describe the composition, function, and clinical use of the flow cytometer
- independently search for, read, compile in writing, and orally present scientific articles with a focus on laboratory methodology
- critically review and provide feedback on a written project
- independently plan, conduct, and evaluate laboratory experiments, and compile results in written reports for oral presentation
- present the most common theories in the philosophy of science
- discuss research-based ethical issues
- describe the work process and procedures involved in quality control and method validation, and statistical calculations and interpretation involved in method validation.

Content

- The organisation and expression of genetic material in eukaryote organisms with special emphasis on the human genome
- Onset and diagnosis of genetic diseases
- Cell culture and sterilisation techniques
- Laboratory work exemplifying methods used in molecular biology, genetics, and cell biology
- Peer review
- Modern theories in the philosophy of science
- Scientific approach
- Introduction to research ethics
- Literature searching and compilation of scientific articles focusing on laboratory methodology
- Method validation.

Type of Instruction

Instruction is delivered in the form of laboratory work, lectures, supervision, and seminars. Participation in laboratory sessions, seminars, and designated lectures is mandatory.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

The course is examined through a written examination and written and oral presentation of reports. Each element is assessed using the grades of Fail, Pass, and Pass with distinction, which are combined to determine the overall grade for the course as a whole.

The grading criteria for the grade of Pass are based on the course objectives (see above).

Resit examination is offered within six academic weeks.

Course Evaluation

During or shortly after the course, a course evaluation should be conducted. The result and analysis of the course evaluation should be promptly communicated to the students who have taken the course. Students who are taking the course when it is offered the next time should be informed of the result at the course introduction. The course evaluation is anonymous.

Required Reading and Additional Study Material

Required reading

Chalmers, A.F. 1999. *Vad är vetenskap egentligen?* Bokförlaget Nya Doxa, the latest edition.

Strachan, T. & Read, A.P. *Human Molecular Genetics*. Garland Science, the latest edition.

Material from lectures

Scientific articles

Reference literature

Kumar, R. 2005. *Research Methodology – a Step-by-step Guide for beginners*. Sage Publications, the latest edition.

Relevant course reading from previous courses in the Biomedical Laboratory Science Programme.