



Course syllabus

Faculty of Health and Life Sciences

Department of Chemistry and Biomedical Sciences

1BL009 Klinisk mikrobiologi med laboratoriemetodik, 7,5 högskolepoäng

1BL009 Clinical microbiology with laboratory methodology, 7.5 credits

Main field of study

Biomedical Science, Biomedical Laboratory Science

Subject Group

Medicine

Level of classification

First Level

Progression

G1F

Date of Ratification

Approved 2009-06-09

Revised 2017-11-03 by Faculty of Health and Life Sciences.

The course syllabus is valid from spring semester 2018

Prerequisites

Chemistry 30 credits, including at least 7.5 credits of biochemistry, Cell- and molecular biology 7.5 credits, Cell- and molecular biology with laboratory methodology 7.5 credits, Immunology 7.5 credits, or the equivalent.

Objectives

Module 1: Clinical microbiology, 4.5 credits

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

- describe the structure of microorganisms and viruses and provide an overview of bacterial and viral taxonomy
- describe and explain bacterial growth and viral replication
- provide an overview of the metabolism of common pathogens and normal flora
- give examples of mechanisms of action of antibiotics and antiviral agents and explain microbial resistance factors
- describe the progression of an infection and microbial virulence factors in general terms
- describe bacterial gene transfer mechanisms and explain the emergence and

consequences of mutations

- provide an overview of healthcare-associated infections (HCAIs) and associated issues of antibiotic resistance.

Module 2: Biomedical laboratory science, 3 credits

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

- determine cell morphology and gram reaction of bacteria
- apply biochemical methods for genus and species identification of common pathogens and normal flora
- explain common sterilisation and disinfection methods
- prepare and handle solutions and solid culture media under sterile conditions
- isolate bacteria and determine bacterial viability and antibiotic resistance
- provide an overview of the biochemical, immunological, and molecular biological analyses used in clinical microbiological diagnostics.

Content

Module 1: Clinical microbiology, 4.5 credits

- Composition, structure, and taxonomy of microorganisms
- Metabolism and growth of microorganisms
- Bacterial genetics
- Pathogenesis
- Antibiotics and antibiotic resistance
- General virology: structure, composition, and replication
- Parasitology and mycology
- Infection control and healthcare hygiene.

Module 2: Biomedical laboratory science, 3 credits

- Sterilisation and disinfection
- Sterilisation and culturing techniques, substrate preparation, cultivation of pure culture, and specimen preparation
- Diagnostics: sampling techniques, Gram staining, microscopy, biochemical tests, and antibiotic resistance determination

The course also includes a visit to a clinical microbiology laboratory.

Type of Instruction

Instruction is delivered in the form of lectures, group exercises, laboratory sessions, and a study visit to a clinical microbiology laboratory. Participation in laboratory sessions, the study visit, and designated lectures is mandatory.

Examination

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

Module 1

The module is examined through a written examination and a test (Swedish "dugga"). The written examination is assessed using the grades of Fail, Pass, and Pass with Distinction. Remaining elements are assessed with Fail and Pass.

Module 2

The module is examined through a practical examination and written lab reports. The practical examination is assessed using the grades of Fail, Pass, and Pass with

Distinction. Remaining elements are assessed using the grades of Fail and Pass.

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

Modules 1 and 2

Bauman, R.W. *Microbiology with diseases by taxonomy*. Benjamin Cummings. The latest edition.

Blücher, A. (2011). *Mikrobiologisk arbetsmetodik*. Linnéuniversitetet i Kalmar.

Marklund, B.-I. *Laborationskompendium, klinisk mikrobiologi med laboratoriemetodik*. Linnéuniversitetet. The latest edition.