



# FSK3531 Biomedicine for Engineers 12.0 credits

Biomedicin för ingenjörer

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for FSK3531 valid from Spring 2014

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

Enrolled PhD student.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

The overall aim of the course is to give an introduction to biomedicine to PhD students with a background in physics or mathematics, who start to work in research areas closely related

to biology, bioinformatics or medicine.

After the course the student should:

- be able to communicate with research colleagues/collaborators that have a background in cell and molecular biology or in medicine
- have a good knowledge about the structure of the human body and about its organ systems and tissues
- understand the structure of animal cells and function of the cell organelles
- recognize the structure of major classes of macromolecules in the body
- have a good understanding of the major processes and structures involved in the transport within the animal cells and in the communication of the cells with each other and with the environment
- have a good knowledge about the major processes and structures in the basis of circulation, respiration, digestion, immune defence, energy generation, regulation of acid-base and water-salt balance, hormone action and neuronal signaling, and cell reproduction
- be able to discuss ethical problems in biomedical research

## Course contents

**Anatomy:** Main structures and features of the human body (systems, organs, tissues).

**Cell biology:** Structural components of the cells. Basic principles of such cellular functions as transport, cell-to-cell communication and intracellular signaling, energy production, cell reproduction.

**Physiology:** Basic principles of the human body functions, covering the circulatory system, respiration, digestion, immune and endocrine system, acid-base homeostasis, water and salt balance.

## Disposition

Lectures: 34 h

Seminar: 4 h

## Course literature

1. Despopoulos A., Silbernagl S., Color Atlas of Physiology, Thieme.
2. Alberts B. et al., Essential Cell Biology, Garland Science.

The editions used will be announced on the course webpage at least four weeks prior to start of the course.

## Examination

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The course is examined by a written exam (TEN1; 8.0 university credits, grading P/F), a hand-in assignment (an essay about the PhD student's research studies in relation to the course content; INL1; 2.0 university credits, grading P/F) and a presentation on a seminar (SEM1; 2.0 university credits, grading P/F).

## Other requirements for final grade

INL1 - hand-in assignment, 2.0 university credits, grading P/F.

SEM1 - seminar, 2.0 university credits, grading P/F.

TEN1 - written exam, 8.0 university credits, grading P/F.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.