



# HL2020 Tissue Physiology and Pharmacology 15.0 credits

Vävnadsfysiologi och farmakologi

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 HL2020 valid from Autumn 2007

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

## Specific prerequisites

Basic knowledge of anatomy, e.g. from the courses HL2006 Medical Engineering, Basic Course and/or HL1010 Systems Biology.

## Language of instruction

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

## Intended learning outcomes

The course deals with tissue physiology and pathology as well as the influence of biomaterials (biocompatibility) and the effects of different pharmacological agents.

The student should after completed course be able to:

- Understand the basic physiological and structural properties of human tissues
- Understand basic elements of tissue homeostasis
- Get an insight into tissue adaptation mechanisms
- Understand the basics of regulation of gene expression
- Get an insight into the structure and function of the genome, transcriptome, proteome and physiome
- Understand the basics of inflammation and immunology
- Understand blood coagulation and anti-clotting mechanisms
- Have an insight in tissue reactions to foreign materials and injury
- Understand wound healing and tissue repair
- Get an insight into tissue engineering techniques
- Understand the basics of cell- and gene transfer/therapy
- Get an overview of how medical device electrical stimulators affect different tissues
- Know about the basic methods to assess cell and tissue function (metabolism, signaling, electrophysiology, contractility/force)
- Understand the physiological and disease related relevance and limitations of various biomarkers
- Understand the principles of anatomic positioning of different medical devices

## Course contents

Tissue and cell biology, histology, extracellular matrix, intercellular communication/growth factors, tissue metabolism, cell signalling, biomarkers, electrophysiology, immunology, microbiology, biocompatibility.

Seminars with industry researchers.

## Course literature

Biomaterials Science and Biocompatibility, Frederick H. Silver, David L. Christiansen, Springer Verlag, 331 pp, 2005.

## Examination

- PRO1 - Assignments, 5.0 credits, grading scale: P, F

- TEN1 - Examination, 10.0 credits, grading scale: A, B, C, D, E, FX, F

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.

## Other requirements for final grade

Examination (10 ECTS): Grade A-F

Home assignments, Labs and Project reports (5 ECTS), grade 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.