



# HL2008 Simulation Methods in Medical Engineering 7.5 credits

Simuleringsmetoder i biomedicinsk teknik

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

## Establishment

Course syllabus for HL2008 valid from Autumn 2007

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Electrical Engineering

## Specific prerequisites

Bachelor's degree in Engineering Physics, Electrical Engineering, Computer Science or equivalent.

Basic knowledge of anatomy.

## Language of instruction

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

## Intended learning outcomes

Theory and practical use of medical simulations is studied. A comprehensive introduction to the methods and theory of medical simulations is provided. The course is suited for biomedical engineering students, which have limited experience and want an introduction to the theoretical background for medical simulations.

## Course contents

The laboratory exercises of the course are devoted to the presentation of medical simulation systems with working demonstrators.

Following this course you will gain knowledge and understanding of:

- Mathematics and physics background of medical simulations and solution methods
- Simulations for medical imaging applications
- Simulations for radiation therapy
- Haptic simulations
- Surgical simulations
- Molecular simulations
- Cellular simulations
- Tissue and organ biomechanics simulations using finite elements
- Simulations for fluid and climate technology

## Course literature

To be decided.

## Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, 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.

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

## Other requirements for final grade

Passed written exam (TEN1; 4,5 cr.), grading A-F.  
Passed lab work (LAB1; 3 cr.), 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.