HL2008 Simulation Methods in Medical Engineering 7.5 credits

Simuleringsmetoder i biomedicinsk teknik

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 HL2008 valid from Spring 2019

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, physics background and solution methods of medical simulations.
- Biomechanics simulations using finite elements.
- Simulations for Fluid and Climate Technology.
- Haptic simulations.
- Surgical simulations.
- Molecular simulations.
- Simulation of neural networks.

Course literature

Introduction to computation and modeling for differential equations / Lennart Edsberg

Utdelat material.

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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

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.