



IH2653 Simulation of Semiconductor Devices 7.5 credits

Simulering av halvledarkomponenter

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

Establishment

On 2019-10-15, the Dean of the EECS school has decided to establish this official course syllabus to apply from spring term 2020 (registration number J-2019-1878).

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

A basic course in semiconductor components or semiconductor physics and a course in electromagnetic field theory.

Language of instruction

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

Intended learning outcomes

Having passed the course, the student shall be able to

- implement numerical solutions of basic one- and multi-dimensional differential equation problems
- use computer programs for the solution of partial differential equations
- use computer programs for multi physics simulations
- choose the type of hardware that is appropriate for resource demanding numerical modelling
- assess the validity of simulation results through comparison with theory, measurements, or other simulations.

Course contents

- Basics of electromagnetism and its numerical analysis.
- Transport phenomena and their numerical analysis.
- Discretisation in one and multiple dimensions.
- Numerical solution of partial differential equations with the finite difference method, the finite element method and the finite volume method.
- Applications of numerical methods to semiconductor components and nanostructures.
- Kinetic transport models and Monte Carlo simulation.

Examination

- ANN1 - Assignments, 7.5 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.

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

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.