EI2403 Electromagnetic modelling 8.0 credits

Elektromagnetisk modellering

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

The official course syllabus is valid from the autumn semester 2024 in accordance with decision by Head of School : J-2023-2211.Date of decision: 2023-10-12

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge in electromagnetic field theory, 9 higher education credits, equivalent completed course EI1320 or both courses EI1220 and EI1222.

Knowledge in plasma physics, 7.5 higher education credits, equivalent completed course EF2200.

Active participation in a course offering where the final examination is not yet reported in LADOK is considered equivalent to completion of the course. Being registered for a course counts as active participation. The term 'final examination' encompasses both the regular examination and the first re-examination.

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to

- describe the differences between different numerical methods and determine which methods are suitable for a given problem
- set up a mathematical model for simpler electromagnetic problems
- use simulation tools (COMSOL, CST, Matlab, etc.) to solve electromagnetic problems
- analyse the results of modelling problems based on self-written code and commercial simulation tools
- evaluate the uncertainty in simulation result based on the model and the method.

Course contents

This course introduces the student to the fundamentals of numerical modelling of electromagnetic problems. The methods introduced are relevant and are used daily in industry and academia for research and development. We deal with

- numerical methods (FEM, FDTD, etc.) for solving electromagnetic problems
- development of own simulation tool for a specific problem
- use of commercial simulation tools for solving general and advanced problems.

Examination

- INL1 - Hand-in assignments, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written exam, 2.0 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.

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.