DD2370 Computational Methods for Electromagnetics 7.5 credits

Beräkningsmetoder för elektromagnetiska problem

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 the director of first and second cycle education decision J-2024-0515.Decision date: 2024-04-15

Grading scale

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

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

- Knowledge and skills in programming, 6 credits, equivalent to completed course DD1337/DD1310-DD1319/DD1321/DD1331/ DD100N/ID1018.

- Knowledge in linear algebra, 7,5 credits, equivalent to completed course SF1624/SF1672/SF1684.
- Knowledge in Calculus in One Variable, 7,5 credits, equivalent to completed course SF1625/SF1673.
- Knowledge in Calculus in Several Variables, 7,5 credits, equivalent to completed course SF1626/SF1674.

Language of instruction

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

Intended learning outcomes

On completion of the course, the students should be able to

- independently apply established methods for the solution of electromagnetic problems
- develop and implement numerical methods and software for differential models with finite differences and finite elements as well as integral equation models
- account for the advantages and the limitations with different numerical technologies
- use available commercial software and with consideration to basic properties and limitations of it.

Course contents

- Maxwell's equations and basic concepts in electromagnetics.
- Numerical methods based on discretisation with finite differences and finite elements as well as the method of moments.
- Theory of convergence, stability and error analysis.
- Development of software for electromagnetic problems.
- Commercial software for electromagnetic problems.

Examination

- LAB1 - Laboratory, 1.0 credits, grading scale: P, F
- LAB2 - Laboratory, 1.0 credits, grading scale: P, F
- LAB3 - Laboratory, 1.0 credits, grading scale: P, F
- LAB4 - Laboratory, 1.0 credits, grading scale: P, F
- PRO1 - Project assignment, 3.5 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.

Transitional regulations

TEN1 is replaced by PRO1.

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.