FEI3300 Electromagnetic Theory, PhD Course II 6.0 credits

Elektromagnetisk fältteori, doktorandkurs II

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

Establishment

Course syllabus for FEI3300 valid from Autumn 2011

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After completion of the course the student shall be able to

- explain the physical meaning of Maxwell's equations
- explain the Green functions for the wave equation

- calculate the retarded fields from continuous sources and point charges
- explain and use the conservation laws for energy, momentum and angular momentum
- describe transformation properties of the fields under spatial inversion and time-reversal
- calculate the reflection and transmission of plane waves
- explain the concept waveguide mode and analyse modes in simple metallic waveguides
- solve canonical radiation, scattering and diffraction problems
- use the Lorentz transformation in special relativity
- describe 4-vector quantities, the field tensor and the covariant formulation of Maxwell's equations

Course contents

Mathematical methods for dynamic electromagnetic field problems.

Disposition

Lessons.

Course literature

Jackson, **Classical Electrodynamics** 3:rd ed, chapters 6-11

Examination

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

Home-assignments, written examination and individually assigned problems.

Oral presentation of one problem.

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.