



SK1114 Electromagnetism and Waves 7.5 credits

Elektromagnetism och vågrörelselära

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

Establishment

Course syllabus for SK1114 valid from Autumn 2012

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After the course, the student will be able to:

- Solve technical problems, relevant for the program, which are related to electrical fields, magnetic fields, mechanical waves and electromagnetic waves
- Explain physical problems, conditions and restrictions to cooperation partners with non technical educations
- Estimate sizes, magnitudes and reasonableness in physical problems
- Use and understand restrictions in physical measurements and instruments
- Evaluate and present physical measurements in text and in diagrams.

“Physical” in the text above, means the part of physics that is included in the syllabus below.

Course contents

Electrostatics: Electric force, electric field and potential, Gauss’s theorem, electric fields in metals and dielectrics, the capacitor, electrostatic energy.

Magnetic fields: Sources of the field, force and torque, magnetic materials and magnetic energy. Electromagnetic induction. Introduction to the relationship between electric and magnetic fields, Maxwells equations.

Mechanical waves: Fundamental wave concepts. Acoustics and ultrasound. Technical applications.

Electromagnetic waves: Generation, polarisation, interference, diffraction and applications. Basic geometrical optics. The laser, camera, telescope, microscope and the human eye.

Course literature

Young and Freedman: University Physics, Pearson.

Laborationsinstruktioner/laboratory instructions.

The edition of Young and Freedman used will be announced on the course home page at least four weeks prior to the start of the course. The Mastering Physics web-system (supplement to the book) will be used for hand in tasks.

Examination

- INL1 - Hand In Tasks, 1.0 credits, grading scale: P, F
- TEN1 - Written Exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Experiments, 2.0 credits, grading scale: P, 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.

Other requirements for final grade

The course is examined by written exam (TEN1; 4.5 credits, grading scale A/B/C/D/E/Fx/F), hand-in assignments (INL1; 1 credit, grading scale P/F), passed lab experiments (LAB1; 2 credits, grading scale 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.