



# SK1114 Electromagnetism and Waves 7.5 credits

Elektromagnetism och vågrörelselära

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 Head of School at the SCI School has decided 2020-04-17 to set this syllabus to apply from HT2020, diary number: S-2020-0293.

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Language of instruction

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

## Intended learning outcomes

After completing the course the student should be able to:

- solve technical problems relevant to its program related to electric and magnetic fields, mechanical and electromagnetic waves, and assess the reasonableness of the solution
- use physical measurement methods and instruments, evaluate measurement data and report results and evaluate limitations

## 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, Maxwell's 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.

## Specific prerequisites

### Examination

- INL1 - Hand In Tasks, 1.0 credits, grading scale: P, F
- LAB1 - Laboratory Experiments, 2.0 credits, grading scale: P, F
- TEN1 - Written Exam, 4.5 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.

### 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.