



Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

1ED051 Elstatik och magnetism, 7,5 högskolepoäng
Electrical Static and Magnetism, 7.5 credits

Main field of study
Electrical Engineering

Subject Group
Electrical Engineering

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by Organisational Committee 2009-08-11

The course syllabus is valid from spring semester 2010

Prerequisites
Physics – Electricity and Magnetism 7,5 higher education credits (1FY802) or the equivalent.

Expected learning outcomes

Upon completion of the course, students should be able to:

- describe and use fundamental electrostatic relations (non-moving charges)
- describe and use fundamental magnetic relations (moving charges)
- formulate and solve basic electrostatic and magnetic problems
- use the relations of the most common electrical quantities (current, voltage and resistance)
- describe the properties of the capacitor and the coil and their function in a circuit

Content

The following topics are included:
Electrical statics

- Coulomb's law
- electric field strength, fields and equipotential surfaces
- potentials and voltage
- electrical displacement
- capacitors and capacitor circuits
- the energy stored in a capacitor

- dielectric materials
- layered capacitors

Magnetics

- magnetic field strength, magnetic flow and magnetic flow density
- Biot-Savart's law
- Ampere's law and the law of circulation
- the force on conductors in a magnetic field. (the electrical motor)
- induction and Lenz's law (the generator)
- inductance
- mutual inductance (the transformer)
- ferromagnetism, magnetization curves and hysteresis
- Ohm's law for the magnetic circuit and reluctance
- magnetic energy and force

Type of Instruction

Teaching consists of lectures and practicals. Attendance at the practicals is mandatory.

Examination

The course is assessed with the grades U,3,4 or 5.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation

A written course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required reading

MSI, *Distributed material*, current year.

Pages 85 (85).