



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

1FY808 Elektricitetslära och magnetism, 7,5 högskolepoäng

Electricity and Magnetism, 7.5 credits

Main field of study

Physics

Subject Group

Physics

Level of classification

First Level

Progression

G1N

Date of Ratification

Approved 2010-12-10

Revised 2018-04-23 by Faculty of Technology. Removal of ECTS-grading scale and course evaluation is changed.

The course syllabus is valid from autumn semester 2018

Prerequisites

General entry requirements and Mathematics 3c, Physics 2 or Mathematics D, Physics B (Field-specific entry requirements 8/A8).

Objectives

Having completed the course the student is expected to have:

- basic knowledge in electricity and electro magnetism
- basic knowledge and skills in experimental methodology and didactics.
- skills in use of basic mathematical methods

Content

Electricity

- electrical charging, electric fields, Coulomb's Law, electric dipole
- electric flows, Gauss' law, the field surrounding symmetrical charge distributions
- electric potential, voltage
- capacity, dielectric, condenser combinations, the energy content of condensers, transient course of events
- direct current, resistance, resistivity, effect, effect adjustment in direct currents, Kirchhoff's Laws

Electromagnetism

- magnetic field intensity, forces affecting live conductors and charges in movement, Hall effect

Induction

- Lenz' Law, Faraday's Law, physical bases for generators and transformers
- self-induction, the energy content of inductors, iron losses

Alternating current

- alternating current circuits
- alternating current effect, resonance circuits

Other

- Electric power production and energy systems
- Electrical safety
- Dimensional analysis

Type of Instruction

Lectures, assignments and concept related laboratory work. The laboratory work is conducted independently or in groups and attendance is obligatory.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

Written and/or verbal tests and/or presentations of obligatory assignments. The main form of examination is decided at the start of the course.

Students who do not pass the regular examination are given the opportunity to do a reexamination shortly after the regular exam.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed.

Other

Having completed the training the student will receive a degree certificate upon request from the Degree Office at the Department of Student Affairs.

Students who receive a passing grade in the course may download a course certificate through the Student Portal. Otherwise they may request a course certificate from the

school secretary.

Required Reading and Additional Study Material

Required reading

Lars Bergström och Lars Nordlund, Ellära - krets och fältteori, senaste upplagan, Liber

Excerpts from the Swedish Energy Agency and Swedish Electrical safety Agency publications