Linnæus University

Course syllabus

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

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 by the Board of the School of Computer Science, Physics and Mathematics 2010-12-10

The course syllabus is valid from autumn semester 2011

Prerequisites
General entry requirements and Mathematics D, Physics B or Mathematics 3c, Physics 2.

Expected learning outcomes
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.

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

- Lentz' 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

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).
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.

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

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
Lundström, T, *Ellärakompendium*, MSI, Växjö universitet, 2007. Pages 100 (100).

Alternative literature
Benson, H, *University Physics*, John Wiley & Sons, 1996. Pages 263 (942).
Hewitt, P G, *Conceptual Physics*, Addison-Wesley, 2003. Pages 67 (740).
Manners, J, *Static fields and potentials*, Institute of Physics publishing, 2000. Pages 219 (219).
Norton, A, *Dynamic fields and waves*, Institute of Physics publishing, 2000. Pages 50 (266).
Borgström. S, Jönsson, G, Kullberg, R, *Elektricitetslära med tillämpningar*, Studentlitteratur, 2000. Pages 160 (270).