SI1100 Physics, Basic Course I 9.0 credits

Fysik, grundkurs del I

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

Establishment

Course syllabus for SI1100 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

High-school mathematics and physics.

Language of instruction

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

Intended learning outcomes

Upon completion of part 1 of the course you will

- be familiar with the concept of energy, and the transformation of energy.
- realize how basic thermodynamic concepts can be used in everyday life.
- gain an understanding of theoretical models of thermodynamic states and realize their limitations.

Upon completion of part 2 of the course you will

- Identify basic circuit components and their interactions in electrical circuits;
- Identify and apply some of the most common methods for constructing and analyzing electrical circuits, including error analysis
- Solve problems involving simple electrical circuits
- Qualitatively and quantitatively evaluate applications of electrical circuits

Course contents

Part A: Energy estimates, the ideal gas, deviations from the ideal gas, kinetic gas theory, transport of energy by conduction and radiation, enthalpy and entropy, the laws of thermodynamics, the Carnot process, refrigerators, physical models and limitations, dimensional analysis, qualitative reasoning.

Part B: Direct current circuits, alternating current circuits, complex impedance, frequency spectrum, filters, true values, errors and uncertainty, application examples

Course literature

- Beckman, O., Grimvall, G., Kjöllerström, B., Sundström, T., Energilära. Liber 2005. Exempelsamling.

- Grimvall, G., Basic skills in physics and engineering science, Teoretisk fysik, KTH, 2006

- Young & Freedman, University Physics, ISBN 0-321-20469-7 (same textbook as in Fysik GK II), additional material

- Lab manual.

Examination

- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.0 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

Written exam in thermodynamics (TENA, 5 university credits), written exam in electric circuit analysis (TENB; 3 university credits), passing grade in laboratory work.

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.