SK1102 Classical Physics 12.0 credits

Klassisk fysik

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

Establishment

Course syllabus for SK1102 valid from Spring 2011

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

General requirements for studies in the Degree Progr. in Engineering Physics.

Recommended previous knowledge:
Linear algebra, Differential and Integral calculus.

Language of instruction

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

Intended learning outcomes

After the course, the student shall be able to:

- solve technical problems, relevant for the program, which are related to electrical fields, magnetic fields, electrical circuits, mechanical waves, and electromagnetic waves
- explain physical problems, conditions, and restrictions to cooperation partners with non-technical education
- estimate size and reasonableness in physical problems
- use and understand restrictions in physical measurements and instruments
- evaluate and present physical measurements in text and in diagrams

"Physical" in the text above, means that part of physics that is included in the main content (see below).

Course contents

Part A (Lectures)
Experimental methodology, the Scientific methodology.
Curve fitting, dimensional analysis, written technical reports.
Historical perspective on physical progress.
Basic wave concept, acoustics, waves in music instruments.
Interference and standing waves.
Basic and applied electro-statics.
Basic and applied magnetism and electromagnetism.
Electrical direct current and alternating current circuits.
The electromagnetic wave.
Geometric optics, the camera, the projector, the telescope and the microscope.
Interference and diffraction with electro magnetic waves.
Polarisation.
(38h lectures, 20h seminar)

Part B (Lab course)
Four labs are carried out which aim to teach and practice:

- accuracy in measurements, setup of series of experiments, error analysis and error propagation, simple report writing
- experimental problem solving, the validity of physical models, using the oscilloscope
- experimental applications of the theoretical course content in general.

Further, there is a more extensive lab in electric measurement techniques.

Course literature

Young and Freedman: University Physics, Pearson (the edition used will be announced on the course home page at least four weeks prior to the start of the course).

Instructions to lab experiments.

Examination

- LAB2 - Laboratory Experiments, 1.0 credits, grading scale: P, F
- TEN1 - Examination, 8.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Experiments, 3.0 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.

Written exam in Electromagnetism and waves (TEN1; 8 Credit, grading scale A-F).

Passed lab experiments (LAB1; 3 Credit, grading scale P/F) (LAB2; 1 Credit, 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.