



# HE1009 Applied Electronics 7.5 credits

Tillämpad elektronik

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

## Establishment

Course syllabus for HE1009 valid from Autumn 2007

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Electrical Engineering, Technology

## Specific prerequisites

Basic knowledge from mathematics (algebra, matrices, differential equations, and complex numbers).

## Language of instruction

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

# Intended learning outcomes

The main purpose of the course is to provide knowledge of the most common electronic components and how they are used, as well as to provide knowledge and training in computation, simulation and measurements of electronic systems.

After completion of the course the student should be able to

- explain the structure and function of different diodes and transistors and know the area of use. Furthermore be able to explain basic simulation models.
- explain fundamental electronic ideas concerning analogue building blocks.
- explain different operational amplifiers specification and use.
- describe the concept of feedback and its effects on an amplifier
- describe different types of power amplifiers and how to do simple thermal analysis.
- explain different principles for power supplies.
- describe with models the electronic components which are addressed in the course and use them in simulation regarding impedance, amplification and frequency response.
- work independently with design, simulation, prototyping and testing of analogue function parts .

# Course contents

- Amplification, input resistance, output resistance, bandwidth
- Ideal operational amplifier
- Practical operational amplifier
- Bode diagrams
- Negative feedback and stability
- Semiconductor components. Diode and transistors
- BJT switches
- Orientation about BJT amplifiers
- Differential amplifiers
- Power amplifiers
- Computer programs for measurement
- Computer programs for simulation of electrical circuits
- Power supplies, series regulator and switching regulator

# Course literature

Molin, Bengt: Analog Elektronik, Studentlitteratur, ISBN 91-44-01435-X  
Textmaterial from the institution

## Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 credits, grading scale: A, B, C, D, E, FX, 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 (TEN1; 4.5 cr.), grading A-F

Practical exercises (LAB1; 3 cr.), grading A-F

The final grade is based on the two parts. Grading A-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.