



# IE1206 Embedded Electronics

## 7.5 credits

Inbyggd elektronik

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

### Establishment

Course syllabus for IE1206 valid from Spring 2019

### Grading scale

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

### Education cycle

First cycle

### Main field of study

Technology

### Specific prerequisites

### Language of instruction

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

### Intended learning outcomes

This course provides basic knowledge of circuit theory and electronics. It also provides knowledge of the various devices that can be found in a microcontroller and how these are supposed to be used.

This means that the student after completing the course will be able to

- design, implement and demonstrate a circuit that is controlled by a microcontroller
- explain the basic electrical and magnetic concepts
- describe passive components and electrical networks
- perform network calculation and simulations of electrical nets
- analyze basic electrical circuits
- choose components in a circuit design
- conduct measurements on electrical circuits.

## Course contents

- The microcontroller as an embedded system component.
- Input and output devices in a microcontroller.
- Charge, voltage, current, power and energy.
- Electrical and magnetic fields.
- Kirchhoff's laws and Ohm's law.
- Basic functions of components R, L, C, diode, transistor, operational amplifier and the transformer.
- DC and AC voltage/currents.
- Independent and dependent sources.
- Circuit analysis with mesh and node analysis, superposition and Thevenin/Norton equivalents.
- Transients in RC/RL-nets.
- Analyse RLC-nets including resonance circuits using the phasor method.

## Course literature

Electric Circuits, J.W. Nilsson and S. A. Riedel, 10th edition, Pearson

## Examination

- LABA - Laboratory work, 1.5 credits, grading scale: P, F
- TENA - Examination, 6.0 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.

## **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.