EI1102 Electrical Circuit Analysis 7.5 credits

Elkretsanalys

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

Establishment

Course syllabus for EI1102 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

Language of instruction

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

Intended learning outcomes

The course will give the basic understanding and knowledge of electrical networks and mathematical methods for analysis of linear models. The course is an essential base for further studies in many different areas where piecewise linear or linear models are used.

Aim

After the completed course the student will have the ability to:

- describe properties of passive and active components
- explain concepts in the mathematical model used for description of the circuits
- identify the most common passive and active circuits and describe their properties
- apply the solution methods such as nodal analysis and mesh analysis
- use superposition and two-terminal equivalents
- solve transient problems in switching circuits
- master AC steady state analysis using phasors
- be acquainted with graphical solution techniques for nonlinear components
- apply Joule's law and complex power
- choose a proper method of solution
- verify the solution
- design an electrical model of a simple system
- use simulation software.

Course contents

Ohm's and Kirchhoff's laws. Analysis methods. Transients. Steady state analysis. Phasors. Complex power and impedance matching. Filters. Mutual inductive coupling. Computer simulation. Operational amplifiers. Applications.

Course literature

Petersson: Elkretsanalys (In Swedish) or Dorf/Svoboda: Introduction to Electric Circuits

Examination

- TEN1 - Examination, 5.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 2.0 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

Laboratory assignment (LAB1; 2 cr), Written examination, (TEN1; 5,5 cr).

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.