Analog Electronic Circuits

Analog elektronik
8 credits

Programme course

TSEI01

Valid from: 2022 Spring semester

Determined by	Main field of study	
Board of Studies for Electrical Engineering, Physics and Mathematics	Electrical Engineering	
Date determined	**Course level**	**Progressive specialisation**
2021-09-01	First cycle	G1X
Revised by	**Disciplinary domain**	
	Technology	
Revision date	**Subject group**	
	Electrical Engineering	
Offered first time	**Offered for the last time**	
Autumn semester 2007		
Department	**Replaced by**	
Institutionen för systemteknik		

Course offered for

- Bachelor of Science in Computer Engineering
- Bachelor of Science in Engineering Electronics

Prerequisites

Circuit Theory

Intended learning outcomes

The aim with the course is:

- to give knowledge of components and circuits for analog electronics
- to give basic knowledge of design principles and analysis methods for analog electronic circuits
- to give ability in analog simulation

After the course the student shall have skills to:

- characterize analog systems with system characteristics
- design amplifiers by use of operational amplifiers
- compensate for operational amplifiers non ideal properties
- design amplifiers by use of transistors
- perform functional and performance simulation
- implement the design

As parts of the course the student is expected to be able to:

- design circuits with help of linear models
- determine frequency response of amplifiers with Bode plots
- determine the characteristics of a feedback amplifier
- determine the margin of stability of a feedback amplifier
- design stabilizing networks

Course content

Semi-conductor theory. Simple transistor gain stages, linearized models, frequency properties. Mille effect, in- and output impedance, distortion. Amplifiers, Bode plots, feedback and stability.
Properties of operational amplifiers, realization of operational amplifiers, differential stages, current mirrors, output drivers, common-mode and differential voltages, common-mode rejection ratio, slew rate, open-loop gain, bandwidth, offset, bias current.

Analog simulation.

LiU
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Teaching and working methods

Lectures, lessons and laboratory lessons

Examination

TEN2	Written examination	4 credits	U, 3, 4, 5
LAB2	Laboratory work	4 credits	U, G

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses: Computer Aided Design of Electronics Analog Design, second course

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is "Swedish", the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is "English", the course as a whole is taught in English. Examination language is English.
- If teaching language is "Swedish/English", the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.