

Circuit Theory

Programme course

6 credits

Kretsteori

TNGE37

Valid from: 2017 Spring semester

Determined by

Board of Studies for Electrical
Engineering, Physics and Mathematics

Date determined

2017-01-25

Main field of study

Electrical Engineering

Course level

First cycle

Advancement level

G1X

Course offered for

- Electronics Design Engineering, M Sc in Engineering

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Foundation Courses in Calculus and Linear algebra

Intended learning outcomes

After completing this course students should be able to:

- analyse electric circuits with Ohm's law and Kirchoff's laws
- analyse electric circuits with branch-, mesh- and nodal analysis
- analyse electric circuits with Thevenin's theorem and superposition theorem
- calculate power and energy in DC-circuits
- analyse AC-circuits with phasors and $j\omega$ -method
- analyse series resonance circuit and parallel resonance circuit
- calculate power and energy in AC-circuits
- calculate power factor correction
- using multimeter and oscilloscope

Course content

- DC circuits: Simple resistive circuits. General resistive networks. Network theorems.
- AC circuits: Basic definitions. Phasor representation of sinusoidal AC waveforms. The j operator. The impedance bridge. Resonance. Power and energy. Power factor correction. Computer analysis using PSPICE.

Teaching and working methods

The teaching consists of lectures, exercises and laboratory work.

Examination

LAB1	Laboratory Work	1.5 credits	U, G
TEN1	Written Examination	4.5 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses: Circuit Theory, advanced course

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Adriana Serban

Examiner

Jonte Bernhard

Course website and other links

<http://www2.itn.liu.se/utbildning/kurs/>

Education components

Preliminary scheduled hours: 58 h

Recommended self-study hours: 102 h

Course literature

Jonte Bernhard, Grundläggande kretsteori (kompendium)

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.