



IE1331 High Frequency Electronics 7.5 credits

Hörfrekvens elektronik

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

Establishment

Course syllabus for IE1331 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Technology, Electrical Engineering

Specific prerequisites

Basic course in electrical circuits and analogue electronics

Language of instruction

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

Intended learning outcomes

The student should be able to design analogue electronics aimed for high frequencies.
The student should after the course be able to

- design multistage transistor amplifiers with feedback and analyse its performance at high frequencies
- describe different kind of noise and their frequency spectral density
- calculate and measure noise level on amplifiers
- describe high frequency models for passive devices
- design matching networks for given line impedance
- explain voltage waves on a transmission line and explain why there are reflected waves
- define s-parameters
- explain different kind of power gain in amplifiers
- describe the design flow for high frequency amplifiers with conditionally and unconditionally stability
- design high frequency amplifiers with one transistor with given power gain and verify the stability of the amplifier
- measure reflected and transmitted waves with network analyzer

Course contents

Transistor amplifiers with feedback
integrated analogue circuits
Noise sources, noise calculation and noise measurements
Transmission line theory, reflected waves and impedance match
Smith-diagram
S-parameters
Design of high frequency amplifiers
Measurements with network analyzer

Course literature

0-13-095323-7,
Ludwig, Bretchko Upplaga:
Förlag: Prentice Hall
År: ISBN: 0-13-095323-7

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

Grading scale: A/B/C/D/E/Fx/F Laboratory assignments, 3,0 hp (LAB1) Written exam, 4,5 hp (TEN1)

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.