



Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

2ED113 Avancerad Analog elektronik, 7,5 högskolepoäng
Advanced Analog Electronics, 7.5 credits

Main field of study
Electrical Engineering

Subject Group
Electrical Engineering

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved by the Board of the School of Computer Science, Physics and Mathematics
2011-08-17

The course syllabus is valid from spring semester 2012

Prerequisites
Analogue Electronic Circuits 7.5 credits (1ED012) or equivalent.

Objectives

This course provides deeper knowledge in analog electronics.
After completion the student is expected to:

- have knowledge on the physical principles behind the MOSFET transistor
- be able to mathematically analyze analog integrated circuits and amplifier stages
- have knowledge on stability and circuits with feedback
- have knowledge on construction and design of operational amplifiers
- have an understanding of how different building blocks influence system performance
- be able to design simple integrated circuits
- have an understanding of oscillators and oscillators in phase-locked loops (PLL)

Content

The course covers the following elements:

- MOSFET transistor, semiconductor technology and modeling
- Amplifier stages with one or more transistors for high frequencies
- Operational amplifiers and interaction between the different building blocks
- Frequency analysis

- Feedback, stability and compensation (prevention of instability)
- Noise in building blocks and systems
- Oscillators
- PLL - phase locked loops
- Design and simulation of a simple IC

Type of Instruction

Lectures, tutorials, laboratories and self-study. Laboratory participation is compulsory.

Examination

The course is assessed with the grades U,3,4 or 5.

Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments. The assessment method is decided at the start of the course.

Students who do not pass the regular examination will be offered retrials close to the regular examination.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Compulsory literature:

B. Razavi, *Design of Analog CMOS Integrated Circuits*. McGraw-Hill, International edition (2003). Pages: 596 (676).

DFM, Handed-out material. Pages: 30 (30).