Linnæus University

Jnr: 2014/4177–3.1.2

Course syllabus

Faculty of Technology
Department of Physics and Electrical Engineering

2ED413 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 Faculty of Technology 2014-12-09
The course syllabus is valid from autumn semester 2015

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)
- be able to estimate how a circuit behaves at higher frequencies.

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, a smaller project and self-study. Laboratory participation is compulsory.

Examination
The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

Assessment of student performance is made through written test, presentation of laboratory work and presentation of project. 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.

Course Evaluation
A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed by the coordinating department.

Credit Overlap
This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: 2ED113 Advanced Analog Electronics, 7,5 credits

Other
Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material
Compulsory literature:
B. Razavi, *Design of Analog CMOS Integrated Circuits*. McGraw-Hill, latest International edition.

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