Linnæus University

Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

2ED113 Avancerad Analog elektronik, 7.5 credits
Advanced Analog Electronics

Main field of study
Electrical Engineering

Subject Group
Electrical Engineering

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved 2011-08-17
Revised 2012-08-17 by School of Computer Science, Physics and Mathematics.
Objectives, type of instruction and examination are revised.
The course syllabus is valid from spring semester 2013

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 U, 3, 4 or 5.

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.
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, latest International edition.

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