



IL2238 Fundamentals of Integrated Electronics 7.5 credits

Integrerad elektronik

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

Establishment

On 10/15/2019, the Dean of the EECS school has decided to establish this official course syllabus to apply from spring term 2020 (registration number J-2019-1940).

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Completed courses in analogue electronics equivalent to IE1207/IE1202 and in digital circuits equivalent to IE1204/IE1205.

Language of instruction

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

Intended learning outcomes

After passing the course, students should be able to:

- develop and use large- and small-signal (low and high frequency) MOSFET models and noise models
- use large- and small-signal and noise analysis, frequency response, stability and frequency compensation methods for basic CMOS analogue integrated circuits
- evaluate which circuit architecture is appropriate for a specific application
- design, simulate and analyze basic CMOS analogue integrated circuits and use professional CAD tools
- write a report and make an oral presentation on designed circuits and their performance in order to
- obtain a good understanding of analogue integrated systems, and basic methods and technologies for designing analogue integrated systems.

Course contents

The main focus of the course is on the following topics:

- Introduction to integrated electronic systems
- Integration solutions and specific issues for integration
- MOSFET device operation and models (large- and small-signal, low and high frequency)
- Basic analogue building blocks (amplifiers, current sources, voltage references) of an integrated circuit (IC)
- Frequency response
- Noise
- Feedback
- Operational amplifiers (opamps)
- Stability and frequency compensation of operational amplifiers
- Layout techniques

Examination

- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 4.5 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.

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.