



IL2237 Electronic Systems Design 7.5 credits

Elektroniksystemkonstruktion

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

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

The official course syllabus is valid from the Spring semester 2024 in accordance with the decision by the head of the school: J-2023-1556. Date of decision: 07/06/2023

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge of digital electronics, 6 higher education credits, equivalent completed IE1204/IE1205.

Knowledge of circuit theory and analogue electronics, 7.5 higher education credits, equivalent completed course IE1202.

Course from Upper Secondary School equivalent to the Swedish upper secondary course English B/6.

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, the student should be able to:

- explain and apply basic principles and guidelines for physical architectural design for complex electronic systems from the level printed circuit boards (PCB) to higher levels
- design PCBs considering signal integrity and impedance matching
- analyse and budget system noise
- design power distribution and analyse noise related to power supply
- design impedance matching networks for electronic systems for radio frequency
- analyse the influence of interconnects at different levels on the performance of electronic systems
- analyse EMC/EMI-disturbance in electronic systems
- model the performance of electronic system
- explain how the production of electronics influences the global heating and consumption of natural resources, and how life-cycle analysis and the global aims can be used

in order to obtain coherent knowledge and practical tips about physical (i.e. hardware) architectural design (on PCB and higher levels) of complex electronic systems.

Course contents

1. Leaders that function as transmission lines
2. System design and component modelling
3. System noise and noise budgets
4. Signal integrity in high speed electronic systems
5. Power supply Noise, delivery, distribution and protection
6. Basic RF design and impedance matching
7. High speed PCB level design and higher levels design
8. Basic EMC/EMI and shielding
9. Performance modeling and conceptual design of electronic systems

Examination

- LAB1 - Laboratory, 3.0 credits, grading scale: P, 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.

TEN1 is an oral examination.

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.