



# IL2237 Electronic Systems Design 7.5 credits

## Elektroniksystemkonstruktion

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

### Establishment

Course syllabus for IL2237 valid from Spring 2019

### Grading scale

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

### Education cycle

Second cycle

### Main field of study

Electrical Engineering

### Specific prerequisites

Basic knowledge on circuit theory, digital and analog electronics, from courses e.g. such as IE1204 Digital Design/IE1205 Digital Design and IE1202 Analog Electronics.

### Language of instruction

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

# Intended learning outcomes

The objective of this course is to provide a coherent knowledge and practical hints of relevant issues of physical (hardware) architecture design (at printed circuits board level & higher levels) of complex electronic systems.

After the course the students should be able to:

- Explain and apply basic principles and guidelines of physical architecture design for complex electronic systems, from printed circuits board (PCB) level to higher levels.
- Design PCB's with consideration of signal integrity and impedance matching.
- Analyze and budget the system noise.
- Design power distribution and analyze power supply related noises.
- Design impedance matching network for RF electronic systems.
- Analyze the influence of interconnects at different levels on electronic system performance.
- Analyze EMC/EMI in electronic systems.
- Model the performance of electronic system.

## Course contents

1. Interconnections as transmission lines
2. Packaging elements modeling
3. System noise and noise budgeting
4. Signal integrity in high speed electronic systems
5. Power supply: noise, distribution and decoupling
6. RF design fundamentals and impedance matching
7. High speed PCB level design and higher level design
8. EMC/EMI fundamentals and shielding design
9. Performance modeling and conceptual design of electronic systems

## Course literature

Stephen H. Hall et al: High-Speed Digital System Design, Wiley Publishers, ISBN: 0-471-36090-2

Lecture Notes

## Examination

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

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