FIH3608 Nanoelectronic Device Fabrication 7.5 credits

Nanokomponenttillverkning

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
Course syllabus for FIH3608 valid from Spring 2019

Grading scale
P, F

Education cycle
Third cycle

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

Intended learning outcomes
The course content is an exhaustive treatment of nano- and microdevice fabrication and characterisation through theory and practical exercises. Applications in medicine, biotechnology and molecular electronics.
After the course, the student should be able to explain:
• the fabrication paradigms top down and bottom up
• which process steps are needed for each method respectively
• how the main process steps work
• which physical principles are limiting for fabrication and scaling of a nano- or microde-
vice
• should understand environmental effects of semiconductor production and be aware of
relevant energy savings and efficiency technologies
After the lab course, the student should have:
• fabricated a simple nanostructure
• characterized this structure
• measured electrical properties of a submicron semiconductor device in the research envi-
ronment offered by the KTH nano and microelectronics lab in Kista, Electrum Laboratory.

Course contents
A survey of nanotechnology and applications in medicine, biotechnology and molecular
electronics. The fabrication paradigms: top down (starting from established microdevice
fabrication) and bottom up (starting from molecules that are arrange to self-assemble).
The important steps in the process of modern microelectronic technology. Characterization
methods: electrical, optical, physical, chemical. Overview of nanophysics and simulation
methods.

Disposition
Lectures, Lab exercises and oral examination

Specific prerequisites
Enrolled as a doctoral student

Course literature
Fabrication Engineering at the Micro- and Nanoscale (The Oxford Series in Electrical and

by Stephen A. Campbell (Author)


Silicon VLSI Technology: Fundamentals, Practice and Modeling, Plummer, Deal and Griffin.

Examination
• EXA1 - Examination, 7.5 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.

Lab course and 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.