



IH2659 Nanofabrication Technologies 7.5 credits

Tillverkningsstekniker för nanokomponenter

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

Establishment

Course syllabus for IH2659 valid from Autumn 2023

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge in calculus in one variable, 7,5 credits, corresponding to completed course SF1625/SF1673/SF1685.

Knowledge in classical physics, 7,5 credits, corresponding to completed course SK1108/SK1118.

Documented knowledge in English corresponding to the upper secondary course English B/English 6.

Language of instruction

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

Intended learning outcomes

After the course, the student should be able to

- discuss and review unit manufacturing processes for micro- and nanofabrication on wafers
- discuss and review Moore's law and advanced process technologies
- discuss and review examples of process integration
- use models and calculate relevant characteristics and conditions in process technology
- fabricate devices in a clean room.

Course contents

The course covers process technologies that are used in micro- and nanofabrication of devices and systems on wafers. Applications include all technologies that are based on wafer scale fabrication such as integrated circuits, micro-electro-mechanical systems and optical devices. The basic unit processes deposition, patterning, etching, doping and heat treatment are covered, followed by process integration to build complex devices including statistical process control and yield models. Moore's law and the basic economics for integrated circuits are covered and exemplified by reviewing the state-of-the art process technology nodes. Hands-on experience of fabricating devices in a clean room (Electrum Laboratory) and use a number of unit processes included in the course.

The course gives the student basic understanding of the sustainability aspects in integrated circuit fabrication.

Examination

- LAB1 - Lab, 1.0 credits, grading scale: P, F
- TENS - Written exam, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- TENM - Oral exam, 4.0 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.