SK2730 Nanoscale Technology 7.5 credits

Nanoteknologi

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 SK2730 valid from Autumn 2008

Grading scale

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

Education cycle

Second cycle

Main field of study

Physics

Specific prerequisites

Candidate or equivalent exam in physics, chemistry or engineering.

Language of instruction

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

Intended learning outcomes

The goal of this course is to comunicate practical and knowledge to people working in industry as well as academics who will be working with advanced problems and construction techniques for microelectroics, material physics, or device physics. The practical knowledge is built up from a basic understanding of the underlying physics of nanofabrication, and as such provices a good foundation for future specialists in nanotechnology. With the deepr understanding that this course offers, students will be able to:

- develop new processes for nanofabrication
- choose the best technique for fabrication of a particular nanostructure
- know where to look for deeper knowledge of a particular nanofabrication method.

Course contents

The course describes the most comon processes and materials used in micro and nanofabrication, such as photolithography and different types of deposition and etching of thin films. Advanced processes, such as electron beam lithography, ion beam and focused ion beam etching, will be covered. Not only fabrication, but also various characterization, measurement and imaging methods, such as Scanning Electron Microscopy, Atomic Force Microscoy and sufrace profilometery, are part of the course, which focuses on many types of equipment found in clean rooms and used in micro and nano technology. The basic phyiscs behind these processe, such as plasma and vacuum is described, providing a solid foundation for understanding.

Course literature

The Materials Science of Thin Films by Milton Ohring, Academic Press

Examination

- INL1 - Homework Exercises, 2.0 credits, grading scale: P, F
- LAB1 - Laboratory Exercises, 1.0 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.

Other requirements for final grade

Written exam (TEN1; 4,5 hp, grading scale A-F)
Homework exercises (INL1; 2 hp, grading scale P/F
Laboratory exercises (LAB1; 1 hp, grading scale P/F)

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.