MH2351 Physics of Nanostructured Materials 6.0 credits

Nanostruktur-materials fysik

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 MH2351 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics,Materials Science,Materials Science and Engineering

Specific prerequisites

Material Physics (5A1250) or equivalent

Language of instruction

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

Intended learning outcomes

To provide basic knowledge on the highlights of the fastest growing interdisciplinary aspects of Nanotechnology today. Techniques of man-made artificial materials design and methodology at a nanoscale, characterization and physical property studies using modern surface probe techniques like STM, AFM, MFM and their variants, and especial emphasis on the achievement of unusual mechanical properties will be covered.

Course contents

Introduction to Nanotechnology; Frabrication of nanoparticles; Thin films, dots, self-assembled systems & patterned structures of various materials with a well defined goal; .

Nano-lithography using AFM/SPM technologies; Fabrication of atomically controlled nanostructures and their device Application; Characterization of physical properties from macro to nanoscale; Design of novel bulk materials from nanopowders, sensors;.Design of nanometerscale magnets, memory devices; bio-electronic materials applications

Course literature

- Nanotechnology by G. Timp –Spriner verlag 1999, Compendia
- Hand-outs

Examination

- PRO1 - Project, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- SEM1 - Seminar, 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

Seminars (SEM1; 4,5 cr). Project (PRO1; 1,5 cr)

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.