KF2390 Functional Materials and Surfaces 7.5 credits

Functional Materials and Surfaces

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

Establishment

Course syllabus for KF2390 valid from Spring 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Admission requirements for independent students:
75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding. Documented proficiency in English corresponding to English B.

**Admission requirements for programme students at KTH:
**At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes:
75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding.

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 discuss the chemical approaches to providing materials functionality and

- describe the functionality of materials (e.g. physical, chemical, biological, technological
- analyse and propose structure for a certain functionality and application

Course contents

The aim of the course is to provide the student with an overview of the field of functional materials and surfaces, which spans a huge range of applications and chemistries. In addition to an understanding of the material itself, a description of the synthesis or design of each material will be undertaken.

The course deals with advanced materials and surfaces which have, or are expected to get, great industrial importance. The area covers conducting polymers, mesoporous materials, biomimetic fabrication and information storage devices. Nanocomposites, responsive surfaces and artificial photosynthesis are a few of the applications considered. The course will be divided into several sections, each of which focuses on a particular technology area and the materials chemistry involved. Since the technology is fast evolving, the topics of interest may vary from year to year. The course philosophy is that each section will be given by an expert in the area.

The laboratory work gives the opportunity to examine and evaluate various types of material using (in most cases) research instrumentation. The laboratory work also involves writing a report which should be structured like a scientific publication.

Course literature

Review articles which will be announced when the course starts.

Examination

- ÖVN1 - Exercises, 2.0 credits, grading scale: P, F
- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Examination (TEN1; 4.0 credits)
Laboratory course (LAB1; 1.5 credits)
Tutorials (ÖVN1; 2.0 credits)

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.