KD1161 Materials Chemistry 10.5 credits

Materialkemi

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

Establishment

Course syllabus for KD1161 valid from Autumn 2011

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A.

And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics E, Physics B and Chemistry A.

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

- Perform stoichiometric calculations
- Explain the differences in characteristics between different compounds based on the structures of atoms and molecules and on chemical bonding.
- Use the periodic table to predict differences in the basic chemical properties of substances.
- Explain differences in reactivity and properties of organic and bio-molecules based on functional groups.
- Explain the reaction mechanisms of various organic reaction types with the help and predict the stereochemistry of the products.
- Use the equilibrium concept in order to perform basic calculations of the solubility, complex formation and calculation of pH values in buffers.
- Use redox potential to explain the corrosion process.
- Use projections of the unit cell to calculate the density, bond lengths and coordination numbers for solid compounds
- Interpret simple phase diagrams
- Seek information from the scientific literature and from own work and summarize it into an oral and written report.

Course contents

The course consists of a theoretical part and a project work. The theoretical part presents and discusses basic chemistry on the basis of objective criteria in both the lectures and subsequent exercises. In project work, which runs parallel to the theoretical part, the students gather information and compile a report. Responsibilities include literature search, report writing and oral presentation.

The course is examined by project work and partly through two exams, a mid-course and one at the end.

Course literature

Chemistry: The Central Science, 10th ed. T.L. Brown, H.E. LeMay, Jr, B.E. Bursten & J.R. Burge, Pearson Education Inc. 2006 och utdelat material

Examination

- PRO1 - Project Work, 1.5 credits, grading scale: P, F
- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 6.0 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.

Other requirements for final grade

Examination 1 (TEN1 6 hp)
Examination 2 (TEN2 3 hp)
Project Work (PRO1 1,5 hp)

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.