KD1000 Chemical Principles for Sustainability 3.0 credits

Kemiska principer för hållbar utveckling

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

Establishment

Course syllabus for KD1000 valid from Spring 2020.

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

General eligibility for university studies in Sweden, i.e. completed upper secondary education including documented proficiency in Swedish corresponding to Swedish 3 / Swedish as second language 3 and English corresponding to English 6.

The upper-secondary school from 1 July 2011 and adult education at upper-secondary level from 1 July 2012 (Gy2011)

Specific entry requirements: Physics 2, Chemistry 1 and Mathematics 4. Minimum requirement is a pass grade

The upper-secondary school before 1 July 2011 and adult education at upper-secondary level before 1 July 2012

Specific entry requirements: Mathematics E, Physics B and Chemistry A. The grade Passed or 3 inn each of the subjects is required .

Language of instruction

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

Intended learning outcomes

After completing the course you should be able to:

- Account for the structure of atoms and molecules as well as the states of matter (TEN1, 30 p)
- Perform calculations involving chemical equilibria and chemical reactions (TEN1, 30 p)
- Understand the foundation of chemical thermodynamics (TEN1, 30 p)

Course contents

The course aims to give an introduction to the structure of atoms and molecules, chemical equilibria and chemical thermodynamics. The chemical concepts that will be discussed will be illustrated with examples related to environmental chemistry and sustainable development. The course provides a good basis for further education in chemistry. The course covers:

- Structure of atoms and molecules
- States of matter and phase transitions
- Stoichiometry and atom economy in relation to green chemistry
- Chemical reaction formula and how to balance these
- Oxidation and reduction, redox reactions
- Water and aqueous solutions, acid-base reactions and acidification of our environment
- Energy, enthalpy, entropy, free energy and energy transformations

Examination

- TEN1 - Written exam, 3.0 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.