KD1000 Chemical Principles for Sustainabillty 3.0 credits

Kemiska principer för hållbar utveckling

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

Establishment

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 the course you should be able to:

- Carry our stoichiometric and thermodynamic calculations with balanced chemical equations.
- Discuss chemical principles and how chemistry can contribute in solving environmental problems.
- Understand and discuss information from a scientific chemical context and summarize it to a specific target group.

Course contents

The course aims to provide an introduction to stoichiometry and thermodynamics. The fundamental chemical concepts that will be discussed will be illustrated by examples from the area of environmental and green chemistry. The course provides a good basis for continued studies in chemistry and for understanding of some on the environmental problems that need to be solved in our society. The course covers:

- Stoichiometry and atom economy for Green Chemistry
- Chemical reaction formulas and how these are balanced
- Oxidation and reduction, redox reactions, batteries and fuel cells
- Chemistry of water and aqueous solutions, acid-base reactions and acidification of water and soil
- Energy, enthalpy, entropy, free energy, and energy conversions
- Reaction rates, catalysts and degradability
- Water and energy from a chemical and global perspective

Course literature

Chemical Principles: The Quest for Insight. Peter Atkins, Loretta Jones, Leroy Laverman, 7th edition. ISBN: 9781464183959

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.