KA1020 Fundamental Chemistry 7.5 credits

Grundläggande kemi

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

Establishment

Course syllabus for KA1020 valid from Spring 2020.

Grading scale

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

Education cycle

First cycle

Main field of study

Chemistry and Chemical Engineering, 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:

- Balance chemical reactions, solve stoichiometric and thermodynamic problems
- Solve problems related to atomic structure and chemical bonding
- Solve problems related to chemical equilibria, gases, electrochemistry, organic nomenclature, and spectroscopy
- Perform elementary chemical laboratory work with respect to work environment, safety regulations, and safe handling of chemicals, as well as compile and communicate the results in writing in a clear manner.

Course contents

- Balancing chemical reactions, stoichiometry
- Oxidation and reduction
- An introduction to the theoretical foundations of chemistry: electronic structure of atoms, chemical bonding, isomerism, chemical reactivity, the structure of the periodic system
- General thermodynamics, enthalpy, entropy, Gibbs energy, thermochemical problems
- Ideal gas law, partial pressure
- Chemical equilibrium and the law of mass action with applications to acid-base equilibria, complex equilibria, solubility equilibria, redox equilibria, and partition equilibria
- pH in acid and basic solutions
- Chemical nomenclature
- Electrochemistry, electrochemical cells
- Chemical instrumental methods of analysis, spectroscopy
- Historical examples of advances in chemistry and environmental problems with relations to chemistry
- Practical laborations, chemical work environment, safety regulations, chemical analysis and synthesis

Examination

- TEN1 - Written exam, 5.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laborations, 2.0 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

Written examination (TEN1; 5,5 credits)
Labaratoy Work (LAB1; 2 credits)

The final rating is the same as on the examan obtained by approved laboratory work.

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.