Fundamentals of Chemistry

Grundläggande kemi
6 credits

Programme course

TFKE59

Valid from: 2022 Spring semester

Determined by	**Main field of study**	
Board of Studies for Electrical Engineering, Physics and Mathematics	Chemistry	
Date determined	**Course level**	**Progressive specialisation**
2021-09-01	First cycle	G1X
Revised by	**Disciplinary domain**	
	Natural sciences	
Revision date	**Subject group**	
	Chemistry	
Offered first time	**Offered for the last time**	
Spring semester 2018		
Department	**Replaced by**	
Institutionen för fysik, kemi och biologi		

Course offered for

- Master of Science in Applied Physics and Electrical Engineering
- Master of Science in Applied Physics and Electrical Engineering - International
- Master of Science in Biomedical Engineering

Intended learning outcomes

The course will give the students an introduction to general chemistry and organic chemistry. After completing the course, the student should be able to

- perform stoichiometric calculations.
- describe the structures of atoms and molecules.
- discuss different types of chemical bonding and the relationship between bonding and state of aggregation, and other properties of solids, solutions, and gases.
- explain the meaning of chemical equilibrium, and its applications on equilibria of acids and bases along with solubility equilibria.
- explain the energetics and kinetics of chemical reactions.
- describe the laws of thermodynamics, in particular their application on chemical systems.
- describe the classification of organic substances, their properties and nomenclature.
- describe the conformation and stereochemistry of organic compounds and their common reaction types.
- perform some elementary chemical laboratory techniques, show some skill in theoretical analysis of experimental data and summon up the results in a laboratory report.

Course content

The electronic structures of atoms and molecules. Stoichiometry. Chemical kinetics and equilibria with emphasis on acid-base equilibria. Chemical bonding. The three laws of thermodynamics and the concepts enthalpy, entropy, and free energy. The functional groups of organic chemistry, nomenclature, properties, conformation and stereochemistry. Substitution, elimination and addition reactions in organic chemistry.

Examination

LAB1	Laboratory work	1 credits	U, G
TEN1	Written examination	5 credits	U, 3, 4, 5

To pass the experimental part, the presence at laborations are mandatory and the written reports must be approved.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.