Fundamentals of Chemistry

Programme course

6 credits

Grundläggande kemi

TFKE52

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2017-01-25

Offered for the last time
Spring semester 2020

Replaced by
TFKE64

Main field of study
Chemistry

Course level
First cycle

Advancement level
G1X

Course offered for
-
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

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.

Teaching and working methods
The course consists of lectures, lessons and laboratory work.

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

Department
Institutionen för fysik, kemi och biologi

Director of Studies or equivalent
Magdalena Svensson

Examiner
Helena Herbertsson

Education components
Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Course literature
Zumdahl & Zumdahl, Chemistry 10:e upplagan / 10th edition Material på LISAM / Material from the department found at LiSAM

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.