

# Fundamentals of Chemistry

Programme course

6 credits

Grundläggande kemi

TFKE59

Valid from: 2018 Spring semester

**Determined by**

Board of Studies for Electrical Engineering,  
Physics and Mathematics

**Date determined**

## Main field of study

Chemistry

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Biomedical Engineering, M Sc in Engineering
- 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.

## Examination

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

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

Eleonore von Castelmur

## 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