General Chemistry

Programme course

9 credits

Allmän kemi

NKEA32

Valid from: 2017 Spring semester

Determined by
Board of Studies for Chemistry, Biology and Biotechnology

Date determined
2017-01-25

Main field of study
Chemical Engineering, Chemistry

Course level
First cycle

Advancement level
G1X

Course offered for
- Biology, Bachelor's Programme

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 aim of the course is to introduce a basic knowledge in chemistry for further studies. After completing this course, the student should be:

- able to describe the electronic structures of atoms and molecules.
- able to give the symbols and names for the elements (except for the lanthanides and actinides) as well as naming simple inorganic compounds.
- able to calculate and solve stoichiometric parameters and problems.
- explain driving forces and kinetics of chemical reactions.
- define chemical equilibrium and solve problems concerning chemical equilibrium, e.g., equilibria of acids and bases and solubility.
- describe the basic laws of thermodynamics, in particular their application on chemical systems.
- explain basic electrochemical principles.
- aware of fundamental safety regulations for laboratory work.
- trained in basic laboratory techniques as titrations and spectrophotometric analysis.
- able to write a laboratory report.
- able to briefly describe the importance of chemical knowledge in society.

Course content

Chemical nomenclature and stoichiometry. Chemical reactions. The gas law. Thermochemistry. The electronic structures of atoms and molecules. Orbital theory. Important trends within the periodic table. Chemical equilibrium, e.g. equilibria of acids and bases and solubility. Reaction kinetics: zero, first and second order kinetics. Activation energy and Arrhenius equation. The three laws of thermodynamics and the concepts enthalpy, entropy, and free energy. Electrochemistry.

Teaching and working methods

The course consists of lectures, lessons and laboratory work, including two short written tests.

The five laboratory exercises illustrate important principles discussed in the course.

Examination

LAB1	Laboratory work including two written tests	2.5 credits	U, G
TEN1	Written examination	6.5 credits	U, 3, 4, 5

To pass the laboratory course, two short written tests must be approved as well as four laboratory reports, and the presence at the mandatory lab seminars must be noted.

Grades

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

Other information

Supplementary courses: Organic chemistry and Biochemistry 1.

Department

Institutionen för fysik, kemi och biologi

Director of Studies or equivalent

Magdalena Svensson

Examiner

Helena Herbertsson

Education components

Preliminary scheduled hours: 86 h
Recommended self-study hours: 154 h

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.