



KD2420 Environmental Aspects of Atmospheric, Aquatic and Terrestrial Chemistry 7.5 credits

Miljökemi: atmosfär, vatten och mark

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

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for KD2420 valid from Autumn 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering, Environmental Engineering

Specific prerequisites

Admission requirements for programme students at KTH:

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes:
75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding.

Admission requirements for independent students:

75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding. Documented proficiency in English corresponding to English B.

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 students should be able to:

Explain the transport and accumulation of chemicals and elements by quantifying reactions, speciation and mobility in the geosphere, hydrosphere and atmosphere in the biogeochemical cycle.

Differentiate the dominating chemical mechanisms and processes in the atmosphere.

Explain the chemistry of acidification and eutrophication in natural waters.

Summarize the behavior of organic contaminants in our environment.

Identify our metal sources in the urban environment and describe the chemical reactions of the metals from release to accumulation in the environment.

Discuss technique development in terms of environmental sustainability.

Construct conceptual models of transport and accumulation of chemicals and elements in the biogeochemical cycle.

Course contents

The biogeochemical cycle; circulation of elements through the biotic and abiotic parts of the ecosystem.

Description of the geosphere; soil types, soil profiles, mineralogy, weathering, sorption.

The hydrological cycle; advection, diffusion, dispersion, anaerob/aerob conditions, redox, speciation, gases in water, organic material in water, metals in water/complexation, colloids.

Atmospheric chemistry; chemistry in the stratosphere and the troposphere.

The future environment: ecological sustainability, urban environment, the engineers role

Chemical aspects on environmental protection with limit values.

Acidification and eutrophication.

Organical contaminants.

Metals in the urban environment.

Course literature

Gary W. van Loon and Stephen J. Duffy;
Environmental Chemistry – a global perspective,
Oxford university press.

Examination

- INL1 - Theme 1, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- INL2 - Theme 2, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

Examination (TEN1; 3 credits)

Project (PRO1; 1.5 credits)

Theme 1 (INL1; 1.5 credits)

Theme 2 (INL2; 1.5 credits)

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.