

## Department of Environmental Science

### Syllabus

for course at first level

Introduktion till miljökemi, GN

Introduction to Environmental Chemistry, FC

15.0 Higher Education Credits

15.0 ECTS credits

Course code:	KZ4007
Valid from:	Autumn 2024
Date of approval:	2024-03-22
Changed:	2024-03-25
Department:	Department of Environmental Science
Subject group:	Chemistry
Specialisation:	G1F - First cycle, has less than 60 credits in first-cycle course/s as entry requirements
Main field:	Chemistry

### Decision

Finalized by: Områdesnämnden för naturvetenskap, 2024-03-22

### Prerequisites and special admittance requirements

Knowledge in chemistry equivalent to at least 30 higher education credits is required in order to be eligible for admission to the course. The requirement may be fulfilled by knowledge otherwise acquired.

### Course structure

Examination code	Name	Higher Education Credits
DEL1	Organic Environmental Chemistry	5.0
DEL2	Inorganic Environmental Chemistry	5.0
DEL3	Atmospheric Environmental Chemistry	5.0

### Course content

a. The course deals with chemical and toxicological concepts and definitions in organic, inorganic and atmospheric environmental chemistry. It is an introductory course to the subject, and the three parts provide a basic overview in environmental chemistry which together provide a broad knowledge base for further studies in environmental chemistry.

b. The course consists of the following modules:

Module 1. Organic environmental chemistry 5 credits - addresses the production/sources of organic environmental pollutants, use, properties, spread, transformation in the environment, metabolism and basic chemical analysis.

Module 2. Inorganic environmental chemistry 5 credits - provides a basic overview of the chemical reactions of inorganic substances in natural water; thermodynamics, kinetics and chemical equilibria in nature; inorganic environmental chemistry, especially sources of heavy metals, distribution and health and environmental risks.

Module 3. Atmospheric environmental chemistry 5 credits – the part deals with atmospheric chemistry issues with connection to organic and inorganic environmental chemistry. It provides a basic overview of atmospheric composition and processes; stratospheric ozone chemistry; photochemistry of the troposphere, atmospheric particles, cloud chemistry; air pollution sources, transport, chemistry, deposition and effects; greenhouse gases and climate change.

## **Learning outcomes**

After completing the course, the student is expected to be able to:

- classify and name common organic environmental pollutants and account for their use and basic physical and chemical properties (module 1)
- give an account of environmental chemistry and environmental toxicology central concepts and definitions, and bring reasoning about spread, transformation, and analysis of common organic environmental pollutants (module 1)
- explain how dissolved substances can be measured and calculated and perform calculations for aqueous solutions in equilibrium with solid phase and gas phase (module 2)
- be able to predict the state of a water system based on the variables pH and redox potential and account for that eutrophication, acidification and heavy metals from an environmental chemical perspective (module 2)
- name common air pollutants and account for sources, transport, transformation, deposition and main effects (module 3)
- perform simpler photochemical and cloud chemical calculations (module 3).

## **Education**

The teaching consists of lectures, exercises, excursions and laboratory work. The course is offered in English.

## **Forms of examination**

a. The course is examined in the following way:

Assessment for modules 1-3 takes place through a written exam and laboratory reports.

The examiner has the opportunity to decide on adapted or alternative examination for students with disabilities.

Examination takes place in English.

**b.** A passing final grade requires participation in laboratory sessions. If special reasons exist, following consultation with the teacher involved, the examiner may grant the student exemption from the obligation to participate in certain compulsory instruction.

**c.** Grading: The course's final grade is set according to a seven-point criterion-referenced scale:

A = Excellent

B = Very good

C = Good

D = Satisfactory

E = Adequate

Fx = Failed, some additional work is required

F = Failed, much additional work is required

Grades of modules 1, 2 and-3 will be set according to a seven-point criterion-referenced scale.

A passing final grade requires passing grades on all included parts.

The final grade of the course is determined by weighing the grades from all course modules, where each grade is weighed in relation to the scope of the course modules.

**d.** The course's grading criteria are handed out at the start of the course.

**e.** Students who receive a failing grade on a regular examination are allowed to retake the examination as long as the course is still provided. The number of examination opportunities is not limited. A student who has received a passing grade on an examination may not retake the examination to attain a higher grade. A student who has failed the same examination twice is entitled to have another examiner appointed, unless there are special reasons to the contrary. Such requests should be made to the department board.

The course includes at least three examination opportunities per academic year the course is offered. For the academic years that the course is not offered, at least one examination opportunity is offered. For practical elements, such as laboratory work, opportunities to complement are offered only within the planned course time.

**f.** Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides on the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination opportunity.

**Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times after the course was discontinued. Requests must be made to the departmental board. The provision also applies in the case of revisions of the course syllabus and revisions of the required reading. After the end of the course liquidation period, no examination is offered.

**Misc**

This course is offered as a separate course.

The department of Materials and Environmental Chemistry contribute to this course

This course requires access to a computer.

The required reading is decided by the department board and published on the website of the course in the digital education catalogue at least 2 months before the start of the course.