



DEPARTMENT OF EARTH SCIENCES

GV2003 Environmental Earth Sciences with a focus on water quality, 7.5 credits

Miljögeovetenskap med fokus på vattenkvalitet, 7,5 högskolepoäng
First Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2024-02-01 to be valid from 2024-09-02, autumn semester of 2024.

Field of education: Science 100%

Department: Department of Earth Sciences

Position in the educational system

The course includes 7,5 credits at the undergraduate level. The course could be offered as an elective course subject to availability.

The course can be part of the following programmes: 1) Bachelor's Programme in Earth Sciences (N1GVS) and 2) Bachelor of Science in Environmental Science (N1MVN)

Main field of studies

Earth Sciences

Specialization

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Entry requirements

For admission to the course, at least 40 credits in the main field of Earth Sciences, Marine Sciences or Environmental Sciences are required. Applicants with an equivalent education may be admitted to the course after review and approval.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- identify the most relevant hydrochemical processes that affect surface water and groundwater compositions.
- explain typical hydrochemical parameters and how they are measured for characterizing surface water and groundwater systems.
- use relevant terminology in hydrochemistry.
- determine the main groups of legacy and emerging environmental contaminants, their sources, and abundance.
- understand how legacy and emerging contaminants pose a risk to the water quality in surface water and groundwater systems.

Competence and skills

- know how to sample surface and groundwater to characterize surface water and groundwater systems.
- understand how hydrochemical processes affect the water quality.
- conduct basic geochemical simulations.
- explain the investigation of a contaminated site and identify relevant concepts for remediation.

Judgement and approach

- collect the necessary data to evaluate a hydrochemical process and its consequence for surface water and groundwater systems.
- establish a sampling plan to characterize the contamination of surface water and groundwater systems.
- identify suitable investigation and remediation concepts for contaminated surface water and groundwater systems.

The course is sustainability-focused, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria. The content also constitutes the course's main focus.

Course content

The course provides a basic overview of all aspects of Environmental Earth Sciences and water quality. The main focus of the course is on freshwater quality with an emphasis on drinking water.

The course consist of three modules:

1. Theory

The theory module covers:

- introduction to different branches in hydrochemistry.
- introduction to water chemistry including the relevance of hydrochemistry for the environment.
- overview of the most relevant processes in hydrochemistry.
- introduction to different water contaminants, their abundance, and sources.
- outline of different remediation and investigation concepts for contaminated sites.

2. Exercises

The exercise module covers:

- hydrochemical parameters and their units.
- concept of water saturation with respect to a particular mineral.
- computer based geochemical modelling.

3. Group work

Students work in groups on a contamination case in Sweden that is presented at a seminar.

Form of teaching

The teaching consist of lectures, laboratory sessions, a regional field trip, computer-based exercises, group work and student presentations. Active participation in all graded modules is expected.

Language of instruction: English

Assessment

Graded assignments, 7.5 credits: Fail/Pass/Pass with Distinction

If a student who has twice received a failing grade for the same examination component wishes to change examiner ahead of the next examination session, such a request should be made to the department in writing and should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be

guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years after the course has ceased/been changed. The same applies to internships and professional placements (VFU), although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U). For the grade "Pass" (G) on the entire course, it is required that all graded assignments are passed (>50% of the maximum points for each assignment). For the grade Pass with Distinction (VG), at least 80% of the maximum points is required for each graded assignment.

Course evaluation

The students are given the opportunity to make an anonymous written evaluation of the course.

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

Students admitted to N1GVS Bachelor's Programme in Earth Sciences are given priority for admission to the course.