AL2301 Applied Hydrogeology 7.5 credits

Tillämpad hydrogeologi

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

The course syllabus is valid from Autumn 2024 according to the Head of school decision: A-2023-2926. Decision date: 2023-11-28

Grading scale

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

Education cycle

Second cycle

Main field of study

Built Environment,Environmental Engineering

Specific prerequisites

Bachelor's degree in the field of Civil Engineering, Environmental Engineering, or another subject with clear relevance to the course, of at least 180 ECTS credits, including at least 5 ECTS credits in hydrology and 5 ECTS credits in fluid mechanics, corresponding to the content in courses AE1602 Hydrology or AL1303 Soil and Water, together with AE1601 Fluid Mechanics for Architecture and Built Environment orAE1603 Fluid Mechanics for Energy

and Built Environment. In addition, second cycle courses for at least 30 ECTS credits are required.

English language proficiency equivalent to (the Swedish upper secondary school) English course B/6.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the student should be able to:

- Create a conceptual hydrogeological model for a catchment area

- Develop a numerical hydrogeological model for a catchment area

- Perform flow and contaminant transport modelling of subsurface water for scenario analyses

- Identify and quantify crucial parameters for contaminant transport with groundwater

- Interpret field measurements and experimental data

- Identify water quality problems and suggest appropriate treatment techniques for private water supplies/wells.

Course contents

The main focus of the course is on drinking water resources, and the study site used in most exercises is a real-case site that is evaluated as potential water supply for a municipality. The overall goal of the course is that the student after passing the course should be able to manage a water resource problem, more specific to evaluate an eskers potential as a water supply.

The lectures cover subjects as hydrogeological environments, natural and artificial groundwater recharge, groundwater flow theory, transport processes, boundary conditions and contamination hydrogeology. Moreover, groundwater chemistry, water quality issues and treatment techniques for small-scale water supplies are treated.

The exercises include hydrogeological conceptual modelling, pumping test analysis, numerical hydrogeological modelling for transport and scenario analyses.

Examination

- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- TEN1 - Examination, 3.5 credits, grading scale: A, B, C, D, E, FX, F

- ÖVNA - Exercise, 2.0 credits, grading scale: P, 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.

Transitional regulations

- Previous module "ÖVN1 - take-home assignment" can be replaced by the first two exercises in the new module "ÖVN1 - Exercise".

- Previous module "ÖVN2 - Exercises" can be replaced by the other two exercises in the new module "ÖVNA - Exercise" + "LAB1 - Laboratory experiment".

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.