



AL1303 Soil and Water 7.5 credits

Mark och vatten

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 official course syllabus is valid from Autumn 2024. The decision is made by Director of First and Second Cycle Education: A-2024-0696. Date: 2024-03-22

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Additional regulations

RECOMMENDED PRIOR KNOWLEDGE

SF1676 Differential equations with applications (7.5 credits), AE1601 Fluid Mechanics for Architecture and Built Environment (7.5 credits)

COURSE LITERATURE

Notified at the start of the course

Specific prerequisites

Basic knowledge in geosciences that corresponds to the content of the courses:

- AL1302 Geoscience and Geotechnical Engineering
- AL1301 Natural Resources Theory

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:

- explain the hydrological cycle and identify significant reservoirs and fluxes of water on different spatial and temporal scales
- describe the hydraulic and technical properties of soil and rock materials found in Sweden and the consequences for land use
- describe investigation and evaluation methodologies linked to hydrological processes in land and water system
- apply physical, empirical and statistical relationships to solve applied hydrological problems

Course contents

The hydrological cycle: water availability, water balance calculations on different spatial and temporal scales

Atmospheric water: precipitation, evaporation, evapotranspiration, data availability and measurement methods

Groundwater: formation and occurrence, aquifer properties, groundwater flow in confined and unconfined aquifers, groundwater pumping wells, data availability and measurement methods

Soil water: formation and occurrence, matric potential and capillarity, infiltration, flow in the unsaturated zone, data availability and measurement methods

Hydrogeology: technical and hydraulic properties of soil and rock and its connection to land use, climate change and soil contamination

Surface water: surface runoff, flow conditions, hydrology of lakes, hydrographs, data availability and measurement methods

Catchment models: the rational method, the time-area method, the unit hydrograph method

Statistical methods: basic hydrological statistics, frequency analysis, hydrological design and risk analysis

Examination

- TEN2 - Written exam, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN3 - Exercises and field exercises, 3.5 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.

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.