AL1302 Geoscience and Geotechnical Engineering 7.5 credits

Geovetenskap och geoteknik

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

Establishment

The course syllabus is valid from Autumn 2022 according to the school principal's decision: A-2022-0670.Decision date: 2022-03-16.

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

At least 6 credits completed in AI1527 Community building process including TEN2 (1.5 credits) and ÖVN2 (1.5 credits) which correspond to knowledge in natural resource technology and sustainable supply systems - physical conditions for land use (land, water and plant systems), technical supply systems (water, sewage and sewage) energy), consequences of land use, environmental assessments.

Language of instruction

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

Intended learning outcomes

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

- describe the structure and composition of the earth and describe geological conditions in Sweden

- account for the properties and use of different soil and rock materials and identify, classify and compare minerals, rocks and soils commonly found in Sweden

- interpret geological maps and account for the structure of the soil and general layer sequences as well as previous and ongoing processes that shape and affect the landscape

- account for the presence and flow of water in the soil and related concepts, analyze and interpret hydrological data and make flow calculations

- interpret geological and geotechnical data from the most common exploration and sampling methods and assess the suitability of the methods

- analyze mass calculation problems and simple settlement problems

- describe the most common soil reinforcement methods in Sweden and assess when they are suitable for use

- account for the causes and course of landslides and landslides in soil, and propose appropriate preventive measures.

Course contents

The course activities consist of lectures, exercises and field studies.

The course covers landforms and formations as functions of recent and previous geological processes, behavior and physical and chemical (mineralogical) properties of soil materials.

Particular emphasis is placed on the structural structure of bedrock and soil layers and changes in soil properties in the short and long term. Basic knowledge of geological conditions in Sweden is addressed as well as the utilization of soil material. Particular emphasis is placed on survey methodology as well as skills in the interpretation and analysis of geodata (maps and diagrams). The exercises in this part include basic mineral, soil and rock knowledge as well as interpretation of geological data.

The course further covers the hydrological cycle and its constituent parts and terms, calculation methods for flows and water balances, basic statistical analysis of hydrological data, basic knowledge of the soil's water holding properties, groundwater movement under saturated and unsaturated conditions and pore water pressure.

Furthermore, the course deals with basic soil mechanical principles and theories, which are exemplified by some common applications in community building. The course also

covers methodology for soil reinforcement, execution and interpretation of geotechnical investigations, as well as risk assessments for landslides and landslides in building planning.

Examination

- TENA - Written exam, 3.5 credits, grading scale: A, B, C, D, E, FX, F
- TENB - Written exam, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises, 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.

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

All modules are compulsory, TENA and TENB can not be replaced.

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.