



*Course syllabus*

# Geoteknologi Geotechnology

**VTGF05, 6 credits, G2 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED V

**Date of Decision:** 2023-03-21

## General Information

**Compulsory for:** BI3

**Language of instruction:** The course will be given in Swedish

## Aim

The aim is to present basic environmental knowledge concerning geological and geotechnical conditions and thus an understanding of how both natural processes and human activities are risks in today's society. Special focus is made on Swedish conditions where groundwater protection and landslide processes are treated.

## Learning outcomes

### *Knowledge and understanding*

For a passing grade the student must

- be familiar with basics of geology and especially geology of Sweden concerning soils, rocks, groundwater, surface water and topography.
- be able to understand the relationship between contamination of soils, rocks and groundwater to different contaminant sources and structural geological situations.
- be able to understand basics of soil mechanics and especially slope stability.

### *Competences and skills*

For a passing grade the student must

- be able to interpret a geological map and construct a principal section - a type section - and thus describe a rock mass in three dimensions.
- be able to analyse a principal section - a type section - to estimate the need of groundwater protection and slope stability.

- be able to identify the most common geological soil materials.
- be able to assess transport patterns and to calculate transport times of contaminants in ground and groundwater.

#### *Judgement and approach*

For a passing grade the student must

- be well aware of the importance of including geotechnological and geoscientific conditions during urban planning and assessment of societal risks.

## Contents

Minerals. Rocks. Soils - genesis and general properties. Glacial geology and quaternary geology of Sweden. Natural disasters and geological disasters. Earthquakes and volcanoes.

Surface water, precipitation and flooding. Groundwater - aquifers, flow, quality and vulnerability. Transport of pollutants in soils, rocks and groundwater. Groundwater protection.

Basic soil mechanics. Soil strength and bearing capacity. Slope stability. Monitoring of slope stability. Dams and dam failure. Soil mechanical aspects of floodings.

Engineering geological excursion in southwest Scania, Sweden.

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Written examination, compulsory assignment, compulsory presentation seminar and compulsory geological excursion.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

## Admission

**The number of participants is limited to:** No

**The course overlaps following course/s:** VTGA05, VTGA01

## Reading list

- Conny Svensson: Kompendium i Teknisk Geologi AK. Tryckt av KFS, 2012. Kompendium in Swedish only.
- Gerhard Barmen och Conny Svensson: Föreläsningar i grundvattenskydd. Distribueras av institutionen, 2020. Available only in Swedish.
- Conny Svensson: Conny Svensson Ingenjörsgelogiska exkursion. 1996. As a supplement to the course literature, the internet document "Conny Svenssons Ingenjörsgelogiska exkursion" is available at [connywww.tg.lth.se](http://connywww.tg.lth.se).
- Nils Rydén: Föreläsningar kring släntstabilitet. Distribueras via institutionen, 2020. Available only in Swedish.

## Contact and other information

**Course coordinator:** Universitetslektor Nils Rydén, [nils.ryden@tg.lth.se](mailto:nils.ryden@tg.lth.se)

**Teacher:** Universitetslektor Gerhard Barmen, [gerhard.barmen@tg.lth.se](mailto:gerhard.barmen@tg.lth.se)

**Teacher:** Universitetsadjunkt Joakim Robygd, [joakim.robbygd@tg.lth.se](mailto:joakim.robbygd@tg.lth.se)

**Further information:** In the time plan below excursion hours have been presented as

laboratory hours (L) and seminars with oral presentations by the students or scheduled time for discussions with the teachers have been presented as exercise time (O).