

## COURSE SYLLABUS

### Hydraulics and Geotechnics, 7.5 credits

*Hydraulik och geoteknik, 7.5 högskolepoäng*

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Course Code: THGK16	Education Cycle: First-cycle level
Confirmed: Sep 01, 2025	Disciplinary domain: Technology
Valid From: Aug 31, 2026	Subject group: Civil Engineering
	Specialised in: G1F First cycle, has less than 60 credits in first-cycle course/s as entry requirements
	Main field of study: Civil Engineering

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### Intended Learning Outcomes (ILO)

On completion of the course the student shall:

#### Knowledge and understanding

- demonstrate comprehension of hydraulics and soil mechanics and their technical applications
- demonstrate knowledge of the properties of soils and the factors that affect these properties

#### Skills and abilities

- demonstrate the ability to calculate hydrostatic pressure
- demonstrate the ability to calculate flowing fluids under pressure and on open channels.
- demonstrate the ability to calculate and analyse stresses and deformations in the ground
- demonstrate the ability apply principles of seepage and permeability
- demonstrate the ability to apply consolidation theory to predict soil deformation

#### Judgement and approach

- demonstrate the ability to evaluate the shear strength of soils using various methods

### Content

The course covers fluid mechanics and soil behaviour in the context of civil engineering, with a focus on principles and practical applications for the planning and implementation of construction projects.

The course includes the following elements:

Hydraulics:

- Applications in hydrostatic pressure.
- Hydraulic pressure against surfaces.
- Continuity considerations for flowing fluids.
- Energy equation and friction losses for pipe flow.
- Channel flow in hydrodynamics.

Geotechnic:

- Soil Mechanics Principles: effective stress, total stress, consolidation, and shear stress, and their significance for geotechnical analysis.
- Seepage and Permeability: Darcy's law, hydraulic conductivity, and consequences for soil stability.

### Type of instruction

Lectures, laboratories and exercises. The course includes one-time examination components.

Language of instruction is Swedish or English.

## Entry requirements

General entry requirements and taken course Structural Mechanics 1, 7.5 credits (or the equivalent).

## Examination and grades

The course is graded 5, 4, 3 or U.

Registration of examination:

Name of the Test	Value	Grading
Examination <sup>1</sup>	6 credits	5/4/3/U
Laboratory	1.5 credits	G/U

<sup>1</sup>Determines the final grade of the course, which is issued only when all course units have been passed.

## Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.