

COURSE SYLLABUS

Geotechnical Engineering and Ground Improvement, 6 credits

Geokonstruktion och markförbättring, 6 högskolepoäng

Course Code:	TGKN16	Education Cycle:	First-cycle level
Confirmed:	Sep 01, 2025	Disciplinary domain:	Technology
Valid From:	Aug 31, 2026	Subject group:	Civil Engineering
		Specialised in:	G2F First cycle, has at least 60 credits in first-cycle course/s as entry requirements
		Main field of study:	Civil Engineering

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- demonstrate knowledge of stress distribution in soils due to surface loading
- demonstrate knowledge of site investigation methods, including borehole planning, soil sampling, and field tests
- demonstrate knowledge of methods for calculating elastic and consolidation settlements of foundations
- demonstrate knowledge of soil bearing capacity and understand different foundation types, as well as how to design shallow foundations
- demonstrate knowledge of the bearing capacity of single piles and pile groups in soil
- demonstrate knowledge of available ground improvement techniques, their principles, applicability, and limitations.

Skills and abilities

- demonstrate the ability to design shallow foundations
- demonstrate the ability to design deep foundations
- demonstrate the ability to analyze and evaluate settlements of foundations
- demonstrate the ability to apply ground improvement techniques in design.

Content

The course covers foundation engineering with a focus on soil behavior, site investigations, and the design of shallow and deep foundations. Topics include stress distribution, settlements, bearing capacity, and ground improvement techniques.

The course includes the following elements:

- Site investigations
- Stress distribution in soils
- Bearing capacity
- Design of shallow foundations
- Settlements
- Design of deep foundations
- Types of piles
- Ground improvement techniques

Type of instruction

Lectures, exercises, and project work.

Language of instruction is Swedish or English.

Entry requirements

General entry requirements and completed courses 60 credits in first cycle, including BIM 2 Analysis and Structural Design - Civil Engineering, 6 credits, Hydraulics and Hydrology, 6 credits and Geotechnical Engineering, 6 credits (or the equivalent).

Examination and grades

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

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	3 credits	5/4/3/U
Assignment	3 credits	5/4/3/U

Course literature

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

Coduto, Donald P., *Foundation design: principles and practices* . Pearson Education Limited

Tomlinson, M. J., *Foundation design and construction*, 2001; Seventh edition

Das, Braja M., and Nagaratnam Sivakugan. *Principles of foundation engineering* . Cengage learning

Han, Jie. *Principles and practice of ground improvement* . John Wiley & Sons

Kirsch, Klaus, and Alan Bell, eds. *Ground improvement* . CRC Press

Eurocode 7: Geotechnical Design – Part 1: General Rules. SS-EN 1997-1.

Eurocode 7: Geotechnical Design – Part 2: Ground Investigation and Testing. SS-EN 1997-2.

Course lecture notes