

# Concrete Structures and Geo Construction

Programme course

8 credits

Betong- och geokonstruktion

TNBI63

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Mechanical  
Engineering and Design

**Date determined**

2017-01-25

## Main field of study

Civil Engineering

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Civil Engineering, B Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Structural Mechanics and Strength of Materials. Building Technology basic course. CAD Technology 2D. Soil Mechanics.

## Intended learning outcomes

The course intends to give basic knowledge of concrete- and geotechnical structures. After completing this course students should be able to

- describe the basic principles of reinforced concrete structures in regard to common load situations and environment classes
- design basic structures by using tables, formulas and handbooks and give an account of the calculations so they are easy to follow and understand
- perform calculations of reinforced concrete structures in ultimate limit state and in serviceability limit state and geotechnical structures in ultimate limit state
- design basic reinforced concrete structures subject to bending moment, shear force and normal force and calculate crack width and deflection
- perform design of basic geotechnical structures such as foundation pads and piles together with an overview of retaining walls
- use terminology, symbols and conventions adequately
- estimate calculations with reasonable approximations
- perform written reports together with reinforced drawings for two assignments
- perform one laboratory work with written report

## Course content

Concrete structures: Concrete- and reinforcement materials. Design subject to bending moment, shear force and normal force. Crack width due to bending moment. Design directions and design of reinforced concrete details. Reinforcement drawings. One-way and two-way slabs in accordance with standard methods. Punching. Walls of concrete, high beams. Foundations for walls and piles. Geotechnical structures: Design of foundation pads and piles. Retaining walls. Drawing instructions.

## Teaching and working methods

The lectures content theoretical parts and solutions of typical problems, preparations for assignments and laboratory exercise. An educational visit provided any suitable object.

## Examination

UPG1	Hand-in exercises	2 credits	U, G
TEN1	Written examination	6 credits	U, 3, 4, 5

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Department

Institutionen för teknik och naturvetenskap

## Director of Studies or equivalent

Dag Haugum

## Examiner

Davod Tagizade

## Course website and other links

## Education components

Preliminary scheduled hours: 56 h  
Recommended self-study hours: 157 h

## Course literature

Beräkning av betongkonstruktioner, Björn Engström, CTH Dimensionering av grundläggning. Byggformler och tabeller, Paul Johannesson mf, Liber

## Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).