



# AF2101 Concrete Structures 7.5 credits

Betongbyggnad

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

## Establishment

Course syllabus for AF2101 valid from Autumn 2010

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

The Built Environment

## Specific prerequisites

120 hp högskolestudier inom teknik eller det naturvetenskapliga området samt svenska B och engelska B eller motsvarande.

- Byggnadsmekanik grundkurs (SG1801)
- Byggkonstruktionslära grundkurs (AF1005)
- Byggkonstruktion fortsättningskurs (AF2001)

## Language of instruction

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

## Intended learning outcomes

After having passed the course the student should be able to:

- Explain the function of common structural elements of reinforced concrete and be able to illustrate this with drawings and sketches
- Explain the theoretical background to the yield line theory and the strip method for the analysis of reinforced concrete slabs
- Calculate the load bearing resistance of rectangular reinforced concrete slabs on walls according to the yield line theory, table method and strip method
- Calculate the load bearing capacity of rectangular reinforced concrete slabs on columns according to the strip method
- Explain punching of a concrete slab on a column
- Calculate the load bearing resistance of integrated structures consisting of a concrete slab interacting with an underlying beam of steel or concrete
- Explain the causes of cracking of newly cast, coarse concrete structures and be able to assess the risk of crack formation and to recommend actions for crack reduction
- Explain cracking strength, residual strength, ductility index and the residual strength factor
- Explain the modes of action of bonding shotcrete, rock anchored shotcrete and shotcrete arches
- Calculate the load bearing resistance of bonding shotcrete and rock anchored shotcrete in some simple cases

## Course contents

- Concrete slabs
- Coarse concrete structures
- Composite structures of concrete and steel
- Fibre concrete and shotcrete

## Course literature

Olofsson, T., Nilsson, M., "Betongplattor - teori och dimensioneringsmetoder"

Holmgren, J., Lagerblad, B., Westerberg, B., Kompendium "Armerad betong"

Ansell, A., Silfwerbrand, J., "Krympning, pågjutning och samverkan hos betongkonstruktioner"

Kurslitteratur för fiberbetong och sprutbetong meddelas senare

## Examination

- ÖVN1 - Exercises, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, 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.

TEN1 - Examination 4.5 credits, grade scale A-F

ÖVN1 - Exercises 3.0 credits, grade scale P,F

## Other requirements for final grade

All parts need to be passed

## 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.