



# AF2201 Bridge Design 7.5 credits

## Brokonstruktion

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

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for AF2201 valid from Spring 2018

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Built Environment

## Specific prerequisites

A completed Bachelor's degree in engineering, science, economics, planning or a similar degree, which includes at least 60 cr in mathematics, physics, statistics and/or computer science, including documented proficiency in English B or equivalent (TOEFL, IELTS e.g).

For students registered on a KTH programme:

AF2003 Structural Engineering, Advanced Course

AF1005 Structural Engineering, Basic Course

or equivalent courses

## Language of instruction

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

## Intended learning outcomes

This course deals with planning and design of both simple bridges such as beam type bridges as well as other more complicated bridge structures such as arch bridges and cable supported bridges. Preliminary design of a bridge is included in this course as a project task.

The aim of this course is to give basic knowledge on planning, analysis and design of bridges. After this course, the student will be able to:

- Classify different types of bridges.
- Calculate loads, lane factor, load cases and load combinations.
- Use influence lines.
- Explain the behaviour of beam type bridges, integral bridges, arch bridges and cable supported bridges
- Create idealized models for analysis and evaluate forces and moments.
- Evaluate forces and moments considering large displacements (2nd order theory).
- Analyse and design a bridge (project task).

## Course contents

- the history of bridge construction and bridge aesthetics
- different bridge types and their behaviour
- loadings, load combinations and load distribution
- influence lines
- design of beam type bridges, integral bridges, arch bridges and cable supported bridges

Design of a bridge is included in the course as a project task.

## Course literature

Report 106, Cable Supported Structures

Report 107, Arch Structures

Report 108, Safety, Loads & Load Distribution on Structures

Report 109, Beam and Frame Structures, chapter 2

Report 116: Infrastructure Structures, chapter 1

Bridge Components

Composite Bridges

## Examination

- BER1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Written examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises, 1.5 credits, grading scale: P, 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.

## Other requirements for final grade

Passed written exam (3 ECTS credits)

Passed exercises (1,5 ETCS credits)

Approved project task (3 ETCS credits)

## 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.