AF2201 Bridge Design 7.5 credits

Brokonstruktion

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

Establishment

Course syllabus for AF2201 valid from Autumn 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

A completed Bachelor's degree in civil engineering with courses in structural engineering and structural design, including documented proficiency in English B or equivalent (TOEFL, IELTS e g).

For students registered on a KTH programme:

AF2003 Structural Engineering, Advanced Course and

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. Conceptual design of a road bridge is included in the 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 factors, load cases and load combinations.
- Develop and use influence lines for bridge analyses.
- Explain the behaviour of beam type, composite, pre-stressed concrete, arch, and cable supported bridges.
- Create idealized models for analysis and evaluate forces and moments.
- Evaluate forces and moments considering large displacements. (2nd order theory)

Course contents

- The history of bridge construction.
- Different bridge types and their structural behaviour.
- Loads and load distribution on bridges.
- Influence lines.
- Analysis and design of composite bridges.
- Analysis and design of arch bridges.
- Analysis and design of cable supported bridges
- Analysis and design of pre-stressed concrete bridges
- Conceptual design of a road bridge is included in the course as a project task

Examination

- ÖVN1 - Exercises, 1.5 credits, grading scale: P, F
- BER1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Written examination, 3.0 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.

Other requirements for final grade

Approved project task (3 ETCS credits)

Passed written exam (3 ECTS credits)

Passed exercises (1,5 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.