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 2009

Grading scale

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

Education cycle

Second cycle

Main field of study

Built Environment

Specific prerequisites

AF2002 Betong- och stålkonstruktion (AP students)

AF2004 Concrete and Steel Structures (TISEM1 students)

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. Integral bridges are studied in more detail.

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 an integral bridge (project task).
- Explain the prerequisite, behaviour and construction of concrete overlays

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, box girder bridges, integral bridges, arch bridges, cable supported bridges and pre-stressed concrete bridges
- analysis and construction of integral bridges

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

Course literature

Course literature includes the following (bundle cost is 400 kronor for students):

- Loads & Load Distribution on Bridge Superstructures (handouts)
- Report 109: Beam and frame structures
- Report 106: Cable Supported Structures
- Report 107: Arch Structures
- Report 119: Torsion of concrete beams

- Bridge foundations (handouts)
- Repair methods, operation & maintenance of bridges (handouts)

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.