AF2001 Structural Engineering, Advanced Course 7.5 credits

Byggkonstruktionslära, fortsättningskurs

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 AF2001 valid from Autumn 2010

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Completed and documented upper secondary education together with documented proficiency in Swedish B and English B or equivalent (TOEFL, IELTS e g).

SG1801- Structural Mechanics, basic course and
AF1005- Structural Engineering, basic course or equivalent

Language of instruction

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

Intended learning outcomes

The main goal of the course is to give deepened knowledge for the analysis and design of building structures with special reference to load bearing resistance. After having passed the course the student should be able to:

- Calculate the distribution of bending moments, shear and normal forces for statically indeterinate beams and frames within the elastic range
- Explain the static action of different types of bolted joints in steel structures
- Calculate the load bearing resistance of these types of joints
- Explain local buckling, buckling and flexural buckling
- Calculate the load bearing resistance of beams and columns of steel regarding local buckling, buckling and flexural buckling
- Explain the ultimate limit state for a normal and an over reinforced, reinforced concrete section in bending
- Explain the principle of addition and the truss analogy for reinforced concrete beams in shear
- Explain the principles for the reinforcement of frame corners
- Explain the mode of action of deep beams, walls and corbels
- Calculate the load bearing resistance in the ultimate state of long reinforced concrete beams, deep concrete beams, concrete walls and reinforced concrete corbels

Course contents

- Statically indeterminate beams and frames
- Joints in steel structures, analysis and design
- Local buckling of steel sections
- Buckling of columns and systems of columns
- Flexural buckling of beams in compression and bending
- Design of steel structures with special reference to instability
- Design of beams, columns and frames of reinforced concrete with special reference to bending, shear and instability.
- Mode of action and design of deep concrete beams, concrete walls and concrete corbels

Course literature

The course literature is in Swedish

Examination

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

Written examination (TEN1; 4,5 cr)
Exercises (ÖVN1; 3 cr)

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.