AF1006 Structural Mechanics, Basic course 7.5 credits

Byggnadsmekanik, grundkurs

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 AF1006 valid from Autumn 2024

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

SG1117 Engineering mechanics

SF1676 Differential Equations with Applications

Language of instruction

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

Intended learning outcomes

The course intends to give basic knowledge in structural mechanics and facilitate continued studies in structural engineering.

- After the course, the students should be able to:

- Calculate section forces in simple trusses, beams and frames.

- Calculate deflection for beams subjected to bending.

- Explain the relationship between internal section forces and stresses in beams subjected to bending.

- Using the superposition principle to analyse a structure exposed to a combination of loads.

- Using qualitative analysis to estimate the directions of support reactions, the distribution of bending moment, and the shape of the deflection.

- Calculating the critical load for beams with simple boundary conditions.

Course contents

The course should give the student basic knowledge in structural engineering and analysis of designs such as buildings and bridges.

Calculation of section forces as normal force, shear force and bending moment will be treated for simple structures during static strain.

Deflection of simple beams and beam systems are treated through the equation of the elastic deflection curve.

The theory of elasticity and Hooke's law are introduced as well as calculation of normal and shear stresses in beams subjected to bending.

The force method is introduced for calculation of section forces in simple statically indeterminate structures.

Analysis of beams with circular cross-sections subjected to torsion will be treated.

Buckling of columns and beams in the linear elastic region is introduced..

Examination

- PROA - Project assignment, 3.5 credits, grading scale: P, F
- TENA - Written exam, 4.0 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.

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.