



# SE1128 Solid Mechanics for Machine Design 6.0 credits

Hållfasthetslära för konstruktion

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

## Establishment

Course syllabus for SE1128 valid from Autumn 2007

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

SE1010 or SE1020 or SE1055 or SE1012, SE1025.

## Language of instruction

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

# Intended learning outcomes

After the course the participants should be able to

- analyse mechanical systems considering static and dynamic loads,
- at cyclic loading, perform fatigue analyses regarding both life assessments and damage tolerance,
- consider multiaxial fatigue loading from an engineering point of view,
- determine the behaviour of discrete dynamical systems,
- describe modal analyses of discrete dynamical systems,
- analyse time dependent materials and elastomers
- design constructions based on different aspects of solid mechanics.

## Course contents

Static loading: linear fracture mechanics; limit loads; FAD; instability; plasticity; thermal loading. Dynamic loading; periodic loading; transients. Fatigue: standard analysis including multiaxial effects; cumulative damage theory; fracture mechanics. Material behaviour: (polymers and high temperature applications); elastomers. Choice of material. Design based on solid mechanics.

## Course literature

F. Nilsson (redaktör), Kurspärm Hållfasthetslära för konstruktion, 2007

Bengt Sundström (redaktör), Handbok och formelsamling i hållfasthetslära, 2:a upplagan, Institutionen för hållfasthetslära, KTH, 2005.

Per-Lennart Larsson och Ragnar Lundell (redaktörer), Exempelsamling i hållfasthetslära, 5:e upplagan, Institutionen för hållfasthetslära, KTH, 2004.

## Examination

- HEM1 - Assignments, 2.0 credits, grading scale: P, F
- TEN1 - Examination, 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.

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

## Other requirements for final grade

Written exam (TEN1, 4 hp)

Home assignments (HEM1, 2 hp)

## 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.