

# Solid Mechanics - Design Criteria

Programme course

6 credits

Hållfasthetslära - Dimensioneringsmetoder

TMHL24

Valid from: 2017 Spring semester

**Determined by**  
Board of Studies for Mechanical  
Engineering and Design

**Date determined**  
2017-01-25

## Main field of study

Mechanical Engineering

## Course level

First cycle

## Advancement level

G2X

## Course offered for

- Mechanical Engineering, M Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Basic Calculus, Linear Algebra, Engineering Mechanics, Solid Mechanics and Material Science, and basic FEM

## Intended learning outcomes

The course aims at giving the students

- knowledge about the phenomena that may jeopardize the functionality and integrity of a component, such as plasticity, stability, resonance, fatigue, crack growth and fracture
- the ability to carry out basic design work w.r.t. the phenomena listed above
- the ability to use the Finite Element Method (FEM) in the design work w.r.t. some of the phenomena listed above
- an understanding of the importance of result evaluation At the end of the course the students shall be able to
  - give an account of the phenomena listed above
  - carry out design work of the type discussed above

In order to reach the goals of the course, classical lectures and teaching classes will be used in combination with laboratory work (practical and computer based tasks)

## Course content

Multi-axial states, stress and strain analysis, yield criteria, creep (brief overview), stability of discrete and continuous systems, buckling, vibrations in discrete and continuous systems, resonance, fatigue (crack initiation, crack propagation, total life), fracture criteria, and design work.

## Teaching and working methods

The course is based on lectures, teaching classes and laboratory classes

## Examination

LAB1	Laboratory work	1.5 credits	U, G
TEN1	Written examination	4.5 credits	U, 3, 4, 5

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Other information

Supplementary courses: Further courses in the field of Applied Mechanics

## Department

Institutionen för ekonomisk och industriell utveckling

## Director of Studies or equivalent

Peter Schmidt

## Examiner

Lars Johansson

## Course website and other links

<http://www.solid.iei.liu.se/Education/>

## Education components

Preliminary scheduled hours: 66 h

Recommended self-study hours: 94 h

## Course literature

Lundh H. (2000), Grundläggande Hållfasthetslära, KTH Tabellsamling (avd. Hållfasthetslära, LiU)

## Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).