Solid Mechanics, basic course

Programme course

6 credits

Hållfasthetslära

TMMI17

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, B 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
Mathematis, Mechanics (statics)

Intended learning outcomes
One main task in Solid Mechanics is to investigate the interaction between forces (the loading) and deformations in structures made of different materials. In the course, the dimensioning of constructions or parts of them will be studied so that the functioning of the structure is achieved with a sufficient safety. The course will give a fundamental understanding of problems arising in engineering and present simple methods for approximate calculations of stresses in the materials and deformations of the structures.

Course content
Definitions and fundamental concepts. Elementary elasticity theory. Bars loaded in tension and compression and analysis of trusses. Torsion. Bending of beams: moment and shear force diagrams, area moments, normal and shear stresses, deformations, elementary cases. Stability: Euler buckling. Stress analysis at multi-axial stress states and yield criteria. Elementary fracture theory.

Teaching and working methods
The course is given during one quarter (half a semester). Lectures and lessons are given and the students perform laboratory work.

Examination

LAB2	Laboratory work	1 credits	U, G
TEN2	Written examination	5 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses: The Finite Element Method

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Peter Schmidt

Examiner

Daniel Leidermark

Course website and other links

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

Education components

Preliminary scheduled hours: 63 h
Recommended self-study hours: 97 h

Course literature

Additional literature

Books

Lundh H, (2000) *Grundläggande hållfasthetslära*

Compendia

Hållfasthetslära Problem
Sundström B, Handbok och formelsamling i Hållfasthetslära

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.