



## Course syllabus

Faculty of Technology

Department of Mechanical Engineering

2MT031 Hållfasthetslära, fortsättningskurs, 7,5 högskolepoäng

Solid Mechanics, Advanced course, 7.5 credits

### **Main field of study**

Mechanical Engineering

### **Subject Group**

Mechanical Engineering

### **Level of classification**

First Level

### **Progression**

G2F

### **Date of Ratification**

Approved by Faculty of Technology 2018-05-07

The course syllabus is valid from spring semester 2019

### **Prerequisites**

60 credits within the programme which 1MT003 Solid Mechanics, 7,5 credits or similar must be included.

## Objectives

After completing the course the student shall be able to:

- describe different types of stress vs. strain relations and yield criteria
- describe the different deformation and fracture mechanisms of engineering materials
- describe different material models and to what extent they can be applied to different engineering materials
- apply different material models in simple calculation examples
- predict the temperature- and rate-dependence of materials.

## Content

The course comprises the following elements:

- Different types of constitutive behavior of materials
- Criteria for plastic yielding
- Dislocation theory
- Plastic deformation and hardening mechanisms
- Rate-dependence of materials
- Creep
- Fracture mechanics and fatigue

## Type of Instruction

The teaching consists of lectures, laboratory exercises, and tutorials. Participation in the laboratories is mandatory and these are documented in a report.

## Examination

The course is assessed with the grades U, 3, 4 or 5.

The examination consists of two parts, the report of the laboratory work and a written examination. The report of the laboratory work (1 credit) is assessed as failed or passed. The written examination (6,5 credits) is assessed with the grades U, 3, 4 or 5.

Both parts must be approved before the course is passed. The final grade is then given by the grade of the written examination.

## Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed..

## Required Reading and Additional Study Material

### **Required reading**

William F. Hosford, Mechanical behaviour of materials, 2012, Nelson Engineering.  
ISBN: 9781111577742, Latest edition. 420 pp.