



# KF2110 Mechanical Properties of Materials 7.5 credits

Materials mekaniska egenskaper

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 KF2110 valid from Autumn 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Chemical Science and Engineering, Chemistry and Chemical Engineering

## Specific prerequisites

### **Admission requirements for programme students at KTH:**

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes:  
50 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and in computer science or corresponding.

### **Admission requirements for independent students:**

50 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics, computer science or corresponding. Documented proficiency in English corresponding to English B.

## **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 student should be able to:

- Understand and apply the stress and strain concepts
- Know the importance of constitutive equations and constitutive parameters and know these are determined experimentally and which types of constitutive expressions are applied on different material classes
- Explain the relation between atomic structure and Young's modulus and fracture toughness

Understand and apply statistical mechanical rubber elasticity theory

## **Course contents**

Basic continuum mechanics, constitutive relationships for different material classes (elastic, viscoelastic and viscous materials), time- and temperature dependence of viscoelastic materials, fracture mechanics, modern construction- and design facilities, molecular aspects on mechanical properties of materials (enthalpy and entropy elasticity, viscoelasticity).

## **Course literature**

Kompendium

## **Examination**

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 6.0 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.

## Other requirements for final grade

Passed examination (TEN1: 6 credits)

Passed laboratory work (LAB1; 1,5 credits)

## 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.