# SE2152 Mechanics of Fiber Networks and Materials 8.0 credits

**Fibernätverks och materials mekanik**

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

## Establishment

Course syllabus for SE2152 valid from Autumn 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

Basic course in Solid Mechanics, e.g. SE1010, SE1020 or SE1055 or similar.

## 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 students should be able to

- describe and analyse important paper technology applications using correct solid mechanics terminology,
- relate the results from the most important methods for mechanical testing of paper and board to the appropriate solid mechanics terminology,
- describe important aspects of the constitutive modelling of paper and board for analyses of converting and end-use applications,
- demonstrate the benefits of mathematical modelling and numerical analyses in paper technology applications,
- discuss and argue for experimental and numerical results orally and in writing, and
- appreciate the advantages, disadvantages and limitations of using paper as a renewable material.

## Course contents

**Lectures:**

Paper as an engineering material, packaging performance, behaviour of corners in carton board boxes, web dynamics in paper transport systems, statistical aspects of failure of paper products, fracture properties, moisture-induced deformations, creep and relaxation, mechanics in printing nip for paper and board, micromechanics, wood bio-composites – extending the property range of paper products.

**Laboratory:**

Paper testing, design and testing of paperboard package, FEM analysis of paperboard package

## Course literature

Niskanen et al., Mechanics of Paper Products, de Gruyter GmbH & Co. KG, Berlin, ISBN 978-3-11-025463-1, 2012

Magnusson and Östlund, Problems in paper mechanics, KTH, Department of Solid Mechanics, SE-100 44 Stockholm, Sweden, 2013

## Examination

- HEM1 - Home assignments, 2.0 credits, grading scale: P, F
- LAB1 - Laboratory work, 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.

The examiner, in consultation with KTH's coordinator for disabled students (Funka), decides whether an alternative examination suitable for course participants with a documented permanent impairment is possible. The examiner may allow an alternative examination form for re-examination of single course participants.

## Other requirements for final grade

Approved Home assignments, Laboratory and Written examination.

## 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.