



# KF1050 Polymeric Materials 7.0 credits

Polymera material

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

## Establishment

Course syllabus for KF1050 valid from Spring 2011

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Completed upper secondary education including documented proficiency in English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A.

And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics E, Physics B and Chemistry A.

## 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:

- describe the concepts monomers, polymers, and plastics
- describe the concept of glass transition
- understand kinetic-, free volume-, and thermodynamic theories for the glass transition
- describe the concept of semi-crystallinity and the hierarchical structure of semicrystalline polymers and how this can be studied experimentally
- describe the concept of viscoelasticity
- describe tensile and creep testing
- describe polymer processing techniques
- describe the two main polymerization procedures (step- and chain wise polymerization)
- give names on common polymers
- describe molecular weights and molecular weight distributions
- describe different copolymerization reactions
- apply fundamental statistical mechanics on the shape of polymer chains in different states
- describe the basics of rubber elasticity

## Course contents

The aim of this course is to introduce the student to polymer materials. Polymer materials is today a common material used in all fields of applications. Polymer materials with a wide variety of properties can be produced and the properties be tailored with respect to the end-use demands. Basic material knowledge and concepts for material groups in different technique areas is of importance also for engineers not directly involved in material selection processes. The present course describes the production, characterization, physical, chemical, and mechanical properties of polymers on a general basic level.

## Course literature

"Polymer Science & Technology" by Joel R. Fried, ISBN 0-13-018168-4

## Examination

- TEN1 - Written exam, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory, 2.0 credits, grading scale: P, 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.

## Other requirements for final grade

examination, TEN1, 5c, Grading scale: A-F

Laboratory course, Lab 1, 2c, Grading scale: PF

## 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.