



KF1040 Polymer Technology 6.0 credits

Polymerteknologi

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

Establishment

Course syllabus for KF1040 valid from Autumn 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 completing the course the student should be able to:

- Identify and describe the different building blocks of a polymeric material and explain the different ways these can be added together.
- Account for the relationship between chemical structure and material properties.
- Define and describe the phenomena of rubber elasticity, glass transition, polydispersitet and molecular weight distribution.
- Account for different crystalline and amorphous morphology of polymers.
- Describe how the polymerization takes place, and the results obtained for different technologies.
- From the results asked to choose a suitable processing method and testing method.
- Based on a given application, select a suitable polymeric materials with respect to function, plasticity and environmental interactions.

Course contents

- Introduction to polymer technology with definition of basic concepts and history.
- The polymeric structure and the relation structure-properties.
- The concepts rheology and solubility.
- Molecular weight and determination of molecular weight.
- Characterization of chemical, physical-chemical and mechanical properties of polymers.
- Natural polymers.
- Stepwise polymerisation.
- Ion- and coordination polymerisation.
- Radical polymerisation.
- Copolymerization.
- Modification of polymers and additives and chemical reactions.
- Processing of polymeric materials.
- Plastic waste handling.
- Environmental aspects on plastic waste.
- Biopolymers.

Course literature

Book:

"Polymerteknologi – makromolekylär design" by Ann-Christine Albertsson & Ulrica Edlund

Examination

- TEN1 - Examination, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Passed examination (TEN1; 6 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.