KF2190 Polymeric Materials: Structure and Properties 7.5 credits

Polymera material: Struktur och egenskaper

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

Establishment

Course syllabus for KF2190 valid from Spring 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:

- Organize, sort, critically evaluate, and use information from a wide range of sources to extract important data and to apply these to given material problems.
- Identify and describe polymeric materials and material groups and for each group give examples of commercially available materials and their applications.
- Explain and relate the properties of a given polymeric material to its chemical structure.
- Explain how the choice of synthesis and processing technique affects the properties of the resulting polymeric products.
- Predict how a material is affected by additives and outline how you can formulate new materials with predefined properties.
- Choose a suitable polymeric material for a given application taking into account the structure, properties, environmental aspects, and commercial availability of the material.
- Assess, value and compare the influence of polymeric materials production, use, and end-of-life handling on a future sustainable society.
- With a limited set of directions seek information from the scientific literature and subsequently plan and carry out a project based laboratory experiment, while taking into account the environmental aspects of the substances used and created.
- Summarize and present the project work in an illustrative and clear manner in a poster presentation with consideration taken to the target audience

Course contents

This course aims to extend the knowledge the polymerization techniques and the physical properties of the created polymers by giving detailed knowledge of the structure, properties and applications of polymeric materials. This will enable educated assessments on the choice of polymeric materials for a given application and the effect of the chemical structure on the polymer properties.

Course literature

Följande böcker ingår:

- Brydson: **Plastics materials**, ISBN: 0750641320 http://www.knovel.com/web/portal/browse/display?_EXT_KNOVEL_DISPLAY_bookid=440
- Ulrich: **Introduction to Industrial Polymers**, ISBN: 1569901023
- Dyson: **Speciality polymers**, ISBN: 075140358X

Brydson: Plastics materials, ISBN: 0750641320
(see link below)
http://www.knovel.com/web/portal/browse/display?_EXT_KNOVEL_DISPLAY_bookid=440

The literature available with a deposit, subject to availability.

Examination

- TENA - Oral exam, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LABA - Laboratory Work, 3.5 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

Passed Laboratory work (LABA; 3,5 credits) and Examination (TENA; 4,0 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.