KF2180 Biopolymers 7.5 credits

Biopolymerer

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

Establishment

Course syllabus for KF2180 valid from Autumn 2007

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, Biotechnology

Specific prerequisites

KF1010 Polymer Technology and Cellulose Technology

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After finished course the student should be able to:

• Explain and evaluate properties of biopolymers from their structure (atomic, nano-, micro- and macro) and give their relevant chemical structures

• Suggest suitable synthetic and biopolymers for environment adapted products

• Suggest suitable biopolymer for a given polymer application

• Suggest and discuss choice of biopolymer vs. synthetic polymer in various applications with reference to material properties, environment and economy

• Analyse and evaluate sustainability of bio- and synthetic polymers

• Choose appropriate material to packaging, pharmaceutical and biomedical applications with reference to product property vs. environment in humans and nature and waste management

• Give opinion of long-term properties of polymeric materials and environmental impact.

• Give opinion of choice of recycling methods for polymeric materials

• Formulate a relevant problem to be solved based on a topic within the course

• Perform literature survey giving a background to the topic

• Perform experimental works to solve the problem and present and discuss the results

• Analyse and evaluate the results orally and in a written report

Course contents

The structure, function, properties and use of biopolymers. Molecular architecture for some biological structures such as collagen, tissue, silk, wool, spider's thread, shell. Nature as a model for polymeric materials. Cycle- and environment adapted materials. Survey and introduction to biomedical materials and "drug delivery" formulations. Biocomposites and biominerals. Biological attacks on polymeric materials and degradation mechanisms in polymeric materials. Degradation products in different environments. Environmental issues when using polymers. Recovery/reuse of plastics. Polymer characterization in environmental analysis.

Course literature

J. Vincent: Structural Biomaterials

M. Elices: Structural Biological Materials

Scientific publications

Examination

- TEN1 - Examination, 7.5 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

Written examination 4,5 credits.
Projekt lab (report + seminar) 3 credits
Participation in educational visit.

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.