KF2180 Biopolymers 7.5 credits

Biopolymerer

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

Establishment

Course syllabus for KF2180 valid from Spring 2022

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology, Chemical Science and Engineering, Chemistry and Chemical Engineering

Specific prerequisites

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.

Language of instruction

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

Intended learning outcomes

After finishing the course the student should be able to:

- Explain and evaluate biopolymer properties based on their structure (at atomic, nano-, micro- and macro-level) and give their chemical structure.
- Relate a specific biopolymer to biological structures in nature.
- Describe the process and explain alteration of the material properties and environmental effects of biodegradation.
- Identify and discuss current environmental issues with a focus on the material's impact in relation to the sustainable development objectives set by the community.
- Suggest and discuss the choice of biopolymers vs. synthetic polymers suitable for common applications with respect to raw materials, energy aspects, material properties, function, environmental impact, waste management, ethical aspects and economy.
- In a project form, conduct a literature study and laboratory experiments to solve a scientific problem. Evaluate and discuss the results both orally and in a written report.

Course contents

Acquire detailed knowledge of the structure, function, properties and use of biopolymers.

Molecular architecture for some biological structures such as wood, collagen, soft tissue, silk, wool, spider's thread is emphasized.

The concept of nature as a model for polymeric materials is discussed.

The role of biocomposites is related to biological attacks on polymeric materials and degradation mechanisms of polymeric materials with respect to degradation products in different environments.

The discussion focuses on environmental issues when using biopolymers and synthetic polymers, specifically, various paths for recovery/reuse of plastics.

Examination

- TEN2 - Written exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Project Laboratory Work, 3.0 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.

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.