



KF2280 Structure and Function of Biofibres 7.5 credits

Biofibrernas struktur och funktion

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

Establishment

Course syllabus for KF2280 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Physical polymer and cellulose chemistry (KF2200)

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 structure of plant polymers lignin, hemicellulose, pectin and cellulose
- Know and be able to identify different types of plant cells and their biological function
- Describe differences between hardwood and softwood in fibre structure and chemical build-up
- Describe how plant polymers are organized on different hierarchical levels from molecular to fibre level
- Describe the connections between structure and function of different cell types
- The most important reactions during kraft cook and how these affect the fibre properties
- Know the build-up of important wood based materials, plywood lumber, MDF and paper
- Describe the mechanical properties of fibres
- Describe the nature of fibre-fibre interactions

Course contents

1. Wood industry, textile industry and their processes, review
2. Parts of plants and their functions
3. Fibre types and fibre morphology
4. Chemical build-up of fibres I, carbon hydrate chemistry, cellulose
5. Chemical build-up of fibres II, hemicellulose, lignin
6. Chemical build-up of fibres III, extractives, inorganic materials
7. Hierarchical structures, biosynthesis
8. Physical properties of fibres, cell wall thickness, cell wall layers, dislocations (LW)
9. Pulp manufacturing and pulp characterization
10. Fibre-fibre interactions
11. Wood based materials I, paper, cardboard, textile and non-woven
12. Wood based materials II, lumber, fibre boards, particle board, masonite, plywood, wood based composites (LB). Course laboratory work. Wood identifying, fibre microscopy, wood based materials

Course literature

The Ljungberg Textbook Biofibrernas struktur och funkti

Examination

- TEN1 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 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

Written examination (4,5 credits)

Laboratory work (1,5 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.