



KF2450 Fibre Technology - Natural and Synthetic Fibres 7.5 credits

Fiberteknologi - Naturliga och syntetiska fibrer

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

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

Establishment

Course syllabus for KF2450 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

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

- Describe the link between the structure of wood based fibres and the properties of fibre products. Explain which chemical components that constitute the fibre wall, how they are affected by the fibre liberation process and which function they have in the fibre wall
- Explain how fibres interact with moisture and liquid water from thermodynamic principles.
- Explain how fibre chemistry, surface chemistry of fibres and fibre morphology are affected by different unit operations
- Explain the concept of bulk and surface chemistry of wood fibres including methods for determination of these properties.
- Explain how synthetic fibres are manufactured and be able to explain the connection between chemistry, process and properties
- Give examples how fibres can be modified by different chemical and physical methods
- Use English technical and scientific literature and present summaries of appropriate literature in seminars.

Course contents

Raw materials for papermaking and dry formed fibrous networks.

The correlation between fibre and paper/fibre network properties. Influence of unit operations in fibre processing on fibre and network properties (mechanical and optical properties). Cellulose/water interactions. Fibre swelling and its link to process/product properties.

Different methods to physically and chemically modify fibre properties. Hierarchical structure of paper/fibre networks for example for hygiene products. Cellulose based fibre composites and future developments. Chemistry and structure of synthetic fibres.

Laboratory work

Fibre identifications

Charge determination of fibres

Influence of additives on paper propertiesLiteratur study

A mandatory study tour for two days is included in the course.

Course literature

Fibre Technology The Ljungberg Textbook

Examination

- LAB1 - Laboratory Work, 1.0 credits, grading scale: P, F
- SEM1 - Seminar Task, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 5.0 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.

Other requirements for final grade

Examination, acknowledge

Laboratory work

Litterature assignment

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.