

SYLLABUS

Wood material science, anatomy and mechanical characteristics 15 credits W0010T

Trämateriellära, anatomi och materialtekniska egenskaper

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2021-02-17**

Wood material science, anatomy and mechanical characteristics 15 credits W0010T

Trämateriellära, anatomi och materialtekniska egenskaper

First cycle, W0010T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Träteknik	Wood Physics and Wood Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Candidate with a scientific or technical direction or Bachelor degree or equivalent foreign degree, a minimum of 180 credits, with a clear scientific or technical profile of at least 60 credits. Degree must include at least 15 credits in mathematics. It also requires a good knowledge of English equivalent to English B.

Selection

The selection is based on 1-165 credits.

Course Aim

To give the student a basic understanding of the properties of the wood material and how its original properties can be modified in industrial processes.

After completing the course, the student should be able to:

Knowledge and understanding:

- Explain the anatomical structure and chemical composition of the wood material
- Calculate mechanical and moisture responses
- Explain and predict how the wood material will react to heat and moisture load
- Explain the conditions for and the mechanisms behind methods for modifying the properties of the wood material and impregnation

Skills and Abilities:

- Prepare and carry out oral presentation and poster presentation

Valuation and approach:

- Demonstrate an ability to collaborate with other people in a laboratory environment

Contents

The course describes the anatomically structure and chemical composition of wood, from the cell wall to the whole tree.

How the wood material respond to a change in surrounding climate, moisture and heat load.

Methods and mechanisms behind the methods of modification and impregnation of wood.

The course is divided into 6 independent modules where each module is examined separately and based on literature studies in combination with lectures and assignments. The supervisor regularly monitors the student's knowledge development.

The six sections are:

- Anatomy; cell stypes, transport routes of water and nutrients in the living tree as well as differences between hard wood and soft wood
- Chemical composition of the wood material; main chemical composition and the role of the extractives in the living tree
- Mechanical properties of the wood material; the connection between anatomical structure and mechanical and thermal properties
- Moisture properties; the interaction between the wood material and H₂O, in vapor and liquid phase
- Processes and methods for modification and impregnation of wood properties
- Oral presentation and poster presentation

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

Each section is completed and examined separately during the course. The teaching is based on literature studies, pre-recorded lectures, assignments and laboratory work

See the study guide for more detailed information on the implementation of the individual course module.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Approved assignments and quizzes.

Grading: U, 3, 4, 5

Approved laboratory work

Grading: U / G

Written and oral examination

Grading: U, 3, 4, 5

A detailed description of the examination requirement for the individual section can be found in its study guide.

Summarizing grading: U, 3, 4, 5

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Remarks

This course provides necessary basics for further specialization in courses that follow.

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0011	Assignments and tests	G U 3 4 5	3	Mandatory	A21	
0012	Laboratory work	G U 3 4 5	3	Mandatory	A21	
0013	Oral and Written exam	G U 3 4 5	9	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Head Faculty Programme Director Niklas Lehto 2021-02-17

Syllabus established

by Dept. TVM Mats Näsström 2012-03-14