

**SYLLABUS**

# **Materials 7.5 credits**

## **W0005T**

**Materiallära**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

**DECISION DATE**  
**2021-06-16**

# Materials 7.5 credits W0005T

## Materiallära

### First cycle, W0005T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Materialteknik	Materials 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 + Swedish upper secondary school courses Physics 2, Chemistry 1, Mathematics 3c or Mathematics D.

## Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

## Course Aim

After completing the course, the student should have achieved

- basic knowledge of structure, mechanical properties, and application area for metallic, polymeric and wood material.
- knowledge about how the properties of materials depend on their structure and manufacturing method.
- knowledge about phase-diagram and which information that can be gets from phase-diagram.
- basic knowledge about different heat-treatment methods and their influence on materials microstructure and properties.
- basic knowledge about corrosion theory, corrosion types and how to prevent corrosion.
- knowledge of how systematic material selection is performed.

## Contents

The course contains basic material science about metallic-and polymeric materials and wood.

### Metals (60%)

Mechanical properties, plastic deformation and fracture, crystallography and defects in crystals. Alloys, phase diagram, phase transformation and micro constituents (heat treatment and strengthening mechanisms).

### Polymeric materials (25%)

Consumption, application, structure, crystallinity, and glass transition.  
Characteristic mechanical properties and viscoelasticity.  
Composites, rubber, processing methods, additions and material knowledge.

### Wood (15%)

Basic knowledge about the microstructure of wood, mechanical properties, impregnation and surface treatment of wood.

In all parts the materials selection aspects is included.

## Realization

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

## 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.

Written exam, compulsory laboratory work and assignments.

## 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.

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory Work	U G#	1	Mandatory	A12	
0003	Assignment reports	U G#	1.5	Mandatory	A12	
0006	Written Exam 1, Polymers and Wood	G U 3 4 5	2	Mandatory	A21	
0007	Written Exam 2, Metals	G U 3 4 5	3	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 Niklas Lehto, Head Faculty Programme Director 2021-06-16

## Syllabus established

by Dept. TVM Mats Näsström 2012-03-14