



# MF1063 Materials in Design and Product Realisation 9.0 credits

Material i design och produktframtagning

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

## Establishment

Course syllabus for MF1063 valid from Autumn 2022

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

MF1061 Introduction to Design and Product Realisation

MF1062 Design and Product Realization

## Language of instruction

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

# Intended learning outcomes

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

- state the most common construction materials and at a general level their production processes and properties and applications
- state relationship between microstructure and material properties
- describe how mechanisms as hardening and deformation influence the mechanical properties of materials
- describe the most common decomposition and injury mechanisms as corrosion and various types of fractures for the structural materials
- connect material properties to functional requirements of a product
- use methodology for materials selection
- explain and make materials selection at design of structures and products
- select material considering the environmental impact during the life cycle of a product
- explain materials selection from a sustainability perspective

## Course contents

Initially, different structural materials will be introduced and analysed with an emphasis on the relationship between microstructure and the properties of the materials and the influence of mechanisms such as hardening and deformation.

In the product realisation process, requirements that are connected to the product function in a specification are formulated, which should then be mapped to the properties of the materials. This requires general knowledge of the properties of different groups materials. In the course, teaching of systematic materials selection methodology based on material selection tools is therefore included.

The materials selection also has large importance from a sustainability perspective, and in the course, the use of methods is included, to analyse environmental impact at materials selection throughout the life cycle of products. In a project, materials selection methodology will be applied and the environmental impact for a product to be analysed.

## Examination

- PRO2 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- INL1 - Hand in Exercises, 1.5 credits, grading scale: P, F
- TEN2 - Written Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB2 - Laboration, 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.

## **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.