



# MH1014 Fundamentals of Materials 7.0 credits

Materiallära

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

## Establishment

Course syllabus for MH1014 valid from Spring 2009

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Course comparable to:  
KD1160 Materials Chemistry for Materials Design  
MH1010 Thermodynamics of Materials  
SE1020 Hållfasthetslära grundkurs BD

## Language of instruction

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

## Intended learning outcomes

The course covers metallic and ceramic materials. Apart from the specific aims given below the course gives an overview of these materials and their applications.

### After the course the student should be able to:

- sketch the most common crystal structures and give crystallographic orientations and planes in crystals using vectors and Millers indices.
- describe and interpret phase transformations (diffusion controlled as well as diffusionless) and couple these to mechanical properties.
- interpret microstructures and relate them to phase transformations.
- explain/describe/recognize deformation- and strengthening mechanisms specifying the underlying cause (type of defects, microstructure etc).
- describe the most common corrosion and decomposition mechanisms for metallic and ceramic materials.
- use binary and ternary phase diagrams.
- perform simple calculations and estimations within all areas mentioned above
- basic terminology in Swedish and English.

## Course contents

## Disposition

**Lecture:** 28 h

**Laboratory:** 21 h

## Course literature

Materials Science and Engineering, An Introduction, William D Callister, ISBN 978-0-471-73696-7  
Compendium in Materials Science (in Swedish)

## Examination

- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 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

Practicals

Written exam

## 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.