



# MH2300 Functional Materials

## 6.0 credits

### Funktionella material

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

This official course syllabus is valid from spring term 2020, registration number: M-2019-1317.

### Grading scale

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

### Education cycle

Second cycle

### Main field of study

Materials Science, Materials Science and Engineering

### Specific prerequisites

Basic knowledge in Materials science corresponding to the course MH1024 Fundamentals of Materials Science - Metallic Materials, or the equivalent

### 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:

- Describe the properties of different functional materials and formulate models of the underlying physical and chemical phenomena.
- State and compare the most important properties of functional materials including accessibility, price, manufacturability, sustainability, recyclability and environmental impact.
- Search and critically analyse literature data on properties of functional materials.
- Argue for the choice of functional materials for existing and new applications.

## Course contents

Functional materials refer to materials that primarily are not used for their mechanical properties, but for other properties such as physical, chemical etc. The Course deals with:

- **Intermetallic materials, including**
  - o superalloys
  - o memory metals/alloys
  - o surface coating materials
- **Biomaterials**
- **Advanced ceramic materials, including**
  - o ferroelectric and piezoelectric materials
  - o electric insulators
  - o thermal barrier coatings
- **Magnetic materials**
- **Electronic materials, including**
  - o elementary and composite semiconductors
  - o conductive polymers
  - o ionic conductor
- **Catalytic materials**

The course also includes knowledge of which "functions" that can be built in to a material and how one can maximise the performance of the material. Furthermore, information retrieval to find the relevant literature data about functional materials is brought up.

## Course literature

Anges i kurs-PM vid kursstart.

## Examination

- TEN1 - Written examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercise, 3.0 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.

## 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.