



## COURSE SYLLABUS

# Engineering Materials, 7.5 credits

*Konstruktionsmaterial, 7,5 högskolepoäng*

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<b>Course Code:</b> TSKS18	<b>Education Cycle:</b> First-cycle level
<b>Confirmed by:</b> Dean Feb 1, 2017	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Jan 1, 2018	<b>Subject group:</b> MT1
<b>Version:</b> 1	<b>Specialised in:</b> GIF
<b>Reg number:</b> JTH 2017/00478-313	<b>Main field of study:</b> Mechanical Engineering

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall;

Knowledge and understanding

- display knowledge of the relationship between composition, structure and mechanical properties
- display knowledge of the material groups metals, polymers, composites and ceramics
- display knowledge of different types of material properties
- demonstrate comprehension of phase diagrams and alloys
- demonstrate comprehension of corrosion of metallic materials and mechanisms to prevent corrosion.

Skills and abilities

- demonstrating ability to explain test results, for example tensile tests.

Judgement and approach

- demonstrate the ability to different materials towards the state of equilibrium and the importance of this.

### Contents

The course provides basic knowledge of structure and properties of engineering materials as well as the possibilities of influencing material properties.

The course contains the following:

- Atomic structure and atomic bonds
- Crystal structures and defects
- Diffusion
- Phase diagrams and alloys
- Material testing, failure and breakdown
- Iron and non-ferrous metallic materials and applications
- Heat treatment of metallic materials

- Polymeric materials, applications and related manufacturing methods
- Composites
- Ceramics
- Corrosion

### **Type of instruction**

Lectures, exercises and laborations.

The teaching is conducted in English.

### **Prerequisites**

General entry requirements and completed courses in Introduction to Product Development and Engineering, 15 credits and Single Variable Calculus, 9 credits (or the equivalent).

### **Examination and grades**

The course is graded 5,4,3 or Fail.

Registration of examination:

<b>Name of the Test</b>	<b>Value</b>	<b>Grading</b>
Examination <sup>1</sup>	6.5 credits	5/4/3/U
Laboratory work	1 credit	U/G

<sup>1</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

### **Course literature**

The literature is preliminary until one month before the course starts.