



COURSE SYLLABUS **Engineering Materials, 7.5 credits**

Konstruktionsmaterial, 7,5 högskolepoäng

Course Code: TSKS18	Education Cycle: First-cycle level
Confirmed by: Dean Feb 1, 2017	Disciplinary domain: Technology (95%) and social sciences (5%)
Revised by: Director of Education Oct 27, 2021	Subject group: MT1
Valid From: Jan 1, 2022	Specialised in: GIF
Version: 3	Main field of study: Mechanical Engineering

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:

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

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

Course literature

The literature list for the course will be provided 8 weeks before the course starts.

William D Callister Jr and David G Rethwisch

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