

## Course Syllabus

### **Mechanical Properties of Metals 7.5 Credits\*, First Cycle Level 2**

#### **Learning Outcomes**

After completion of this course, students shall be able to:

- demonstrate an understanding of and familiarity with the terminology used in mechanical properties of metals,
- describe the fundamentals of plastic deformation and their mechanisms,
- use basic dislocation theory to understand various hardening mechanisms,
- describe the fundamentals of fracture mechanics,
- understand the fatigue and creep properties of metals, and
- apply their knowledge to model the mechanical properties and solve the problems related to fracture, fatigue and creep.

#### **Course Content**

The course deals with a wide range of topics related to the mechanical properties of metals. These include plastic deformation, deformation mechanisms, dislocation theory, hardening mechanisms, fracture, fatigue, and creep.

Basic theories and knowledge of the subject are presented both in lectures, where a deeper review of different mechanisms of deformation and fracture are given, and through exercises where the students practise their analytical skills. The course also includes assignments and labs on the deformation and testing of metals.

#### **Assessment**

Written examination (5 credits), laboratory experiments (1.5 credits), and assignment (1 credit).

#### **Forms of Study**

Lectures, exercises, laboratory and assignments.

#### **Grades**

The Swedish grades U, 3, 4, 5.

- Laboratory work and assignments U-G.
- To pass the course, students must attain a pass in all parts of the course.
- The written exam guides the final grade for the course.

**Prerequisites**

Bachelor of Science degree in engineering (mechanical, electrical, energy, engineering physics) of at least 180 credits and English 6

**Subject:**

Materials Technology

**Group of Subjects:**

Materials Technology

**Disciplinary Domain:**

Technology, 100%

**This course can be included in the following main field(s) of study:**

1. Materials Technology

**Progression Indicator within (each) main field of study:**

1. G2F

**Approved:**

Approved 2 November 2017

Valid from 16 January 2018