

## Course Syllabus

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

#### **Learning Outcomes**

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

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

#### **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 more in-depth review of different mechanisms of deformation and fracture is conducted, 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), active participation in laboratory experiments and written lab report (1.5 credits), and assignment (1 credit).

#### **Forms of Study**

Lectures, exercises and mandatory laboratory work

#### **Grades**

The Swedish grades U, 3, 4, 5.

- Laboratory work and assignments U-G.
- The grading scale U, 3, 4 and 5 is used for the written examination.
- The written exam determines the final grade for the course.

#### **Prerequisites**

Basic qualifications for university studies at undergraduate level as well as completed studies of at least 90 hec within: energy and environmental technology; mechanical, chemical or civil engineering; or physics, or equivalent knowledge.

**Other Information**

Replaces MP2038.

**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 18 April 2019

Valid from 12 July 2019