MH1019 Advanced Course in Metallic Materials 9.0 credits

Påbyggnadskurs i metaller

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for MH1019 valid from Spring 2010

Grading scale

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

Education cycle

First cycle

Main field of study

Materials Science, Technology

Specific prerequisites

MH1014 Fundamentals of Materials
MH1010 Thermodynamics of Materials

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The course is meant as an introduction to:

- fundamental principles of process metallurgy , which should serve as a base for more advanced studies in metallurgy.
- plastic processing of metals where theoretical tools for analysis of metal working processes will be presented.
- the "Tools", i.e. the software the student will be using during the thesis work

Course contents

The advanced course consists of 3 modules intended to provide a broadening and deepening of knowledge about metallic materials. The modules focus may vary from year to year.

Module 1: Fundamentals of process metallurgy

- In the module the Swedish main production processes for metals are treated. More specifically, it discusses the production of iron, steel, copper, aluminum, zinc and Silicon. The most important thermodynamic and kinetic conditions in each process are treated in a simplified manner.

Module 2: Material forming

- Module 2 includes Industrial casting methods, Plasticity theory and different plastic working processes for metallic materials. Specifically the material behavior at large plastic deformation and the plastic processing operations, forging, rolling, extrusion and drawing are studied. These are dealt with by considering the working temperature, work hardening and micro structural development.

Module 3: Toolbox for materials and processes

- The module will be given in the form of project work where students choose tasks and perform work individually under supervision.

Disposition

Period 3
Lectures 20 h
Exercises 10 h
Experimental work 4 h

**Period 4
**Lectures 36 h
Exercises 8 h
Experimental work 4 h

Course literature

Is announced in course-PM

Examination

- SEM1 - Seminar, 2.0 credits, grading scale: P, F
- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Experimental Work, 1.0 credits, grading scale: P, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

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.