

Advanced Materials Science, 6 HE credits

Avancerad Materialteknik, 6 hp

Established: 2023-11-28

Established by: Department of Engineering Science

Applies from: H24

Learning outcomes

After completing the course the student must be able to demonstrate:

Knowledge and understanding:

- fundamental knowledge and understanding of concepts of metallurgy
- knowledge and understanding of physical metallurgy of specialty metals such as high strength steels, duplex stainless steels, superalloys and titanium alloys

Skills and abilities:

- skill and ability to use specific software in connection to material selection and sustainability
- skill and ability to establish relations between the experimental results in the lab and the theoretical framework

Judgement and approach:

- deep learning approach towards the subject thorough being able to make comparisons and analyses, and by drawing conclusions

Entry requirements

Degree of Bachelor of Science in mechanical engineering, manufacturing engineering, industrial engineering or equivalent. The Bachelor of Science degree must be comprised of at least 7.5 HE credits of materials science and at least 15 credits of mathematics including basic knowledge of analysis, linear algebra and statistics. In addition, verified knowledge of English corresponding to the course English B, English 6 in the Swedish high school or equivalent.

The forms of assessment of student performance

Individual written exam. Individual laboratory report. Individual written assignment. Individual project report with oral presentation.

Course contents

This course covers the fundamental concepts of metallurgy such as diffusion, phase transformation, dislocation, defects, crystal structures, phase diagrams, non-equilibrium states, strengthening mechanisms, mechanical properties and corrosion properties. Furthermore the physical metallurgy of specialty metals such as high strength steels, duplex

stainless steels, superalloys and titanium alloys is studied.

Other regulations

Course grading: F/Fx/E/D/C/B/A - Insufficient, Insufficient- more work required before the credit can be awarded, Sufficient, Satisfactory, Good, Very Good, Excellent

Course language: The teaching is conducted in English.

General rules pertaining to examination at University West are available at www.hv.se.

If the student has a decision/recommendation on special support due to disability, the examiner has the right to examine the student in a customized examination form.

Cycle

Second cycle

Progressive specialization

A1N - second cycle, has only first-cycle course/s as entry requirements

Main field of study

Mechanical Engineering