MH2040 Applied Thermodynamics and Kinetics, Part 1 6.0 credits

Tillämpad termodynamik och kinetik, del 1

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

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

Establishment

Course syllabus for MH2040 valid from Autumn 2020

Grading scale

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

Education cycle

Second cycle

Main field of study

Materials Science,Materials Science and Engineering

Specific prerequisites

MH1010 Basic thermodynamics
MH1018 Transport phenomena
or equivalent

Language of instruction

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

Intended learning outcomes

After the course the student should be abel to:

- thermodynamics for solutions phases (solid, liquid and gas)
- driving force and dissipation of Gibbs energy
- conservation laws for diffusion, energy and mass
- diffusion and heat transfer
- homogeneous reactions
- heterogeneous reactions

Course contents

Gibbs energy and driving force

Modelling of solid substitutional/interstitial solutions, carbides, oxides and intermetallics

Modelling of liquid solutions, molten metals and slags

Phase equilibria and phase diagrams

State of reference and transformation between states of reference and components

Driving force for diffusion and reactions, thermodynamic factor and mobility

Analytical and numerical methods to solve thermodynamic and kinetic problems

Order of reactions, rate constants, overall reaction rate

Parallel and series reactions in heterogeneous systems

Examination

- INL1 - Assignments, 2.0 credits, grading scale: P, F
- INL2 - Assignments, 2.0 credits, grading scale: P, F
- KON1 - Partial exam, - credits, grading scale: P, F
- KON2 - Partial exam, - credits, grading scale: P, F
- TEN1 - Written examination, 2.0 credits, grading scale: A, B, C, D, E, FX, 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.

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.