



MH2000 Experimental Methods

6.0 credits

Experimentella metoder

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

Establishment

On 2024-10-14, the Director of First and Second Cycle Education of ITM school has decided to establish this official course syllabus to apply from spring term 2025 (registration number M-2024-2019).

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Basic eligibility.

Language of instruction

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

Intended learning outcomes

After completing the course the student should be able to:

- Describe modern experimental methods in materials physics and chemistry.
- Judge the precision and accuracy of the measurements.
- Name the limitations of the respective techniques.
- Choose the right technique to address specific material physics and chemistry questions.

Course contents

- Frontline techniques in analysis and characterisation of materials (transmission electron microscopy, x-ray diffraction, scanning electron microscope, optical microscope)
- Experimental conditions (high temperature furnaces, temperature control, gas phase, holding and refractory materials, other conditions)
- Thermodynamic studies (calorimetry, thermal analysis, electromotive force, phase diagram studies, equilibrium and quenching, gas-condensed phase equilibria)
- Kinetic studies (gravimetric analysis, electromotive force)
- Physical properties (thermal and electrical conductivity, viscosity, surface and interfacial tension, density)
- Experimental uncertainty analysis (types of error, standard methods for expressing error, measurement of error, propagation of determinate errors)

Examination

- LABB - Laboratory Work, 1.0 credits, grading scale: P, F
- LABA - Laboratory Work, 1.0 credits, grading scale: P, F
- TENA - Written examination, 4.0 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.

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.