



# IH2652 Methods and Instruments of Analysis 7.5 credits

Analysmetoder och analysinstrument

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

## Establishment

The official course syllabus is valid from autumn semester 2025 according to the decision of Director of First and Second Cycle Education: J-2024-2181. Date of decision: 2024-10-15

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Electrical Engineering

## Specific prerequisites

Knowledge of physics encompassing 30 higher education credits, in the form of completed courses.

## Language of instruction

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

# Intended learning outcomes

After passing the course, the student should be able to:

- give an account of the design and function of a number of advanced material analysis methods
- relevant for applied material research, especially semiconductor technology and nanotechnology, and analyse and interpret measurement results from these methods
- choose appropriate method of analysis or combine methods of analysis for a specific material analysis issue
- correlate measurement results that have been obtained through different methods
- identify and suggest supplementary analysis needed
- critically review material analysis results that are presented in the scientific literature or in other contexts
- independently use different analysis equipment that are available at KTH.

## Course contents

The course refers to material analysis methods, with an emphasis on applications in the nano and semiconductor technology, and includes theory and labs (the later marked with \*) for the following methods:

- X-ray diffraction (XRD)\*
- Sweep tube microscopy (AFM)\*
- Ion beam based methods (SIMS, RBS\*)
- Electron microscopy (TEM, SEM\*)
- Photo-electron spectroscopy (XPS, UPS, Auger, etc.)
- Electric characterisation methods (I/V, C/V, etc.)
- Optical methods (photoluminescence, Raman, FTIR, etc.)

## Examination

- TEN1 - Examination, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Course, 2.5 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.

## Other requirements for final grade

For passed labs, an active participation in the laboratory work and completed preparatory assignments and laboratory assignments and a well-structured laboratory report are required.

## 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.