FMH3926 Introduction to x-ray diffraction with applications in materials science and metallurgy 5.0 credits

Introduktion till röntgendiffraktion med tillämpningar inom materialvetenskap och metallurgi

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

On 24/11/2022, the Dean of the ITM School has decided to establish this official course syllabus to apply from autumn term 2022 (registration number M-2022-2053).

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

The course is aimed for PhD students in materials science and metallurgy.

Language of instruction

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

Intended learning outcomes

After the completed course the student should have:

- A basic understanding of X-ray diffraction (XRD) and its applications in materials science and metallurgy
- Basic skills in the preparation and analysis of measurements with XRD on a laboratory scale
- Ability to understand the scientific literature in the field in order to independently further develop one's own skills in XRD characterization
- A basic understanding of similarities and differences between laboratory-scale and large-scale (synchrotron) XRD measurements

Course contents

Lectures on the subjects:
crystallography, diffraction theory, practical aspects of X-ray diffraction measurements, qualitative phase analysis, quantitative phase analysis, microstructure analysis, applications of XRD in materials science and metallurgy, introduction to synchrotron XRD.

Laboratories on XRD measurements on a lab scale.

Demonstration of synchrotron XRD measurements.

Three homework assignments related to the lectures, the laboratory and the demonstration that the students must solve independently.

Examination

- INL1 - Individual home assignments, 5.0 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.

Other requirements for final grade

Mandatory participation in lectures, laboratories and demonstrations.

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.