

CHEM-E5140 - Materials Characterization, laboratory course D, Lecture, 10.3.2025-20.5.2025

General

This course is an introduction to materials characterization for Master's students. It is mandatory for all Functional Materials(FM) major students. The maximum number of students on the course is limited, and the FM major students have priority. Note that the course registration will close before the course starts, and all accepted students will get a confirmation.

Syllabus: In this course, on the first day of the week, one lecture dedicated to the theoretical part will be delivered, followed by experimental sessions for the remaining four days of the week. Following are the topics

1. X-ray diffraction (XRD)
2. Four probe resistivity and Hall measurement (Semiconductor)
4. Scanning Electron Microscopy (SEM)
5. Energy-dispersive X-ray spectroscopy (EDS)
6.. Atomic Force Microscopy (AFM)
7. Raman Spectroscopy

Welcome

For any questions contact:

The course has contact sessions where analysis methods and data analysis is discussed with equipment experts. You need to prepare for the contact session by self-study the topic beforehand.

The course has 5 laboratory practices and at least 4 must be attended to pass the course. Each laboratory practice will be run for only one week (due to instrument booking) and students participate only in one group (2h) during that week. The groups will be booked with the course starts and you do not need to be in the same group for each laboratory.

Tentative timetable for the contact sessions and laboratory works

(will be updated when confirmed)

Week	Contact session Date	Contact session	Laboratory	Pre-assignment
11	10.3	Introduction to different methods (+ exam questions)	-	XRD Pre-task
12	17.3	XRD	XRD (18.3 to 21.3) Group1 (10:00-12:00) and Group2 (12:00 14:00)	Four probe resistivity and Hall measurement
13	24.3	Four probe resistivity and Hall measurement (Semiconductor)	Four Probe Resistivity and Hall Effect in 25.03 to 28.03Group1 (10:00-13:00) and Group2 (13:00 16:00)	SEM
14	31.3	Scanning Electron Microscopy (SEM)	SEM 1.04 to 3.04 Group1 (10:00-12:00), Group2 (14:00 16:00)	EDS
16	14.04	Energy Dispersive X-Ray (EDS) Spectroscopy	SEM	Raman
18	28.04	-Raman spectroscopy	Raman 29.04 to 2.05 Group 1(10:00-12:00), Group2 (12:00 14:00)	AFM
19	5.05	Atomic Force Microscopy (AFM)	AFM 6.05 to 9.05 Group1 (10:00-12:00), Group2 (12:00 14:00) and Group3 (14:00 16:00)	
20	12.05	Auger, SIMS, and Course Summary	AFM Lab	
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21		13.05-onwards	Oral exam slots (13.05-18.05)	-

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