

COURSE SYLLABUS

Applied Materials Testing and Characterization for Engineers, 7.5 credits

Tillämpad materialprovning och karakterisering för ingenjörer, 7.5 högskolepoäng

Course Code:	T2TMOK	Education Cycle:	Second-cycle level
Confirmed:	Sep 01, 2025	Disciplinary domain:	Technology
Valid From:	Aug 31, 2026	Subject group:	Materials Technology
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- demonstrate comprehension of how experimental methods connect microstructure, processing, and material performance in engineering applications
- demonstrate understanding of the principles, capabilities, and limitations of commonly used materials testing and characterization methods
- display knowledge of measurement uncertainty and error sources, and their impact on data reliability and decision-making in practice

Skills and abilities

- demonstrate ability to plan and conduct materials testing and characterization, including sample preparation, execution, and advanced data evaluation
- demonstrate the ability to communicate experimental approaches and findings

Judgement and approach

- demonstrate the ability to assess the role of experimental methods in solving applied materials challenges
- demonstrate sound judgement regarding validity of test results

Content

The course introduces methods of evaluating material properties and characterizing the microstructure. Experimental work is done both on samples from materials produced by the students and from simulated components produced in industry. Results are analyzed and the reliability of the results are assessed.

The course includes the following elements:

- Fundamental principles behind different testing and characterization techniques
- Planning and hands-on materials investigations
- Mechanical tests of static and dynamic properties
- Analytical methods for thermo-physical properties
- Chemical characterization of materials
- Communication of test results
- Data analysis
- Applied case studies and project work

Type of instruction

Lectures, laboratory sessions and project work.

Language of instruction is English.

Entry requirements

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Materials and Manufacturing, Materials Engineering, Mechanical Engineering, Chemical Engineering, Product Development or Engineering Physics or equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Proof of English proficiency is required.

Examination and grades

The course is graded 5, 4, 3 or U.

Registration of examination:

Name of the Test	Value	Grading
Examination ¹	2.5 credits	5/4/3/U
Laboratory	2.5 credits	G/U
Project	2.5 credits	G/U

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.

1. ASM Handbooks online.