



COURSE SYLLABUS

Material Testing and Characterisation, 6 credits

Materialprovning, 6 högskolepoäng

Course Code: TMRR28	Education Cycle: Second-cycle level
Confirmed by: Director of Education Feb 1, 2017	Disciplinary domain: Technology (95%) and social sciences (5%)
Revised by: Director of Education Oct 28, 2021	Subject group: MA2
Valid From: Jan 1, 2022	Specialised in: A1N
Version: 2	Main field of study: Product Development

Intended Learning Outcomes (ILO)

On completion of the course, the student should

Knowledge and understanding

- have knowledge about appropriate measurement techniques and equipment to determine material properties and microstructure
- have knowledge about material testing standards
- show knowledge about the relationship between structure and material properties
- have knowledge about material properties and material behaviours
- have knowledge about material standards

Skills and abilities

- show ability to evaluate measurements
- show ability in using equipment for material testing and microscopy

Judgement and approach

- show sound judgement regarding validity of measurements and calculated predictions

Contents

The course covers different material properties and material behavior. The link between structure and material properties is studied. Equipment for typical material testing techniques are studied and used in practice. The measurements are analyzed and presented.

The course contains the following topics:

- Testing methodology, material testing standards and material standards
- Mechanical tests of static and dynamic properties
- Analytical methods for thermo-physical properties
- Determination of chemical composition and thermodynamic calculations of microstructure
- Metallographic sample preparation, microscopy and image analysis
- Different techniques for nondestructive testing
- Theory behind the relationship between structure and material properties.

Type of instruction

Lectures, seminars, project work, laboratory and exercises.

The teaching is conducted in English.

Prerequisites

The applicant must hold the minimum of a bachelor's degree (ie. the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Mechanical Engineering or equivalent. Proof of English proficiency is required (or the equivalent).

Examination and grades

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

Registration of examination:

Name of the Test	Value	Grading
Examination ¹	3 credits	5/4/3/U
Laboratory work and Assignemnts	3 credits	U/G

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

Course literature

Literature

The literature list for the course will be provided 8 weeks before the course starts.

Handouts and ASM Handbook online.