



## COURSE SYLLABUS

# Material Testing and Characterisation, 6 credits

*Materialprovning, 6 högskolepoäng*

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<b>Course Code:</b> TMRR28	<b>Education Cycle:</b> Advanced level
<b>Confirmed by:</b> Director of Education Feb 1, 2017	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Autumn 2018	<b>Subject group:</b> MA2
<b>Version:</b> 1	<b>Specialised in:</b> A1N
<b>Reg number:</b> JTH 2017/00655-313	<b>Main field of study:</b> Product Development

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### 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 <sup>1</sup>	3 credits	5/4/3/U
Laboratory work and Assignemnts	3 credits	U/G

<sup>1</sup> 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 one month before the course starts.

Handouts and ASM Handbook online.