Reg No: MTAD18/20192

Faculty of Health, Science and Technology
Materials Engineering

Syllabus

Materials characterisation

Course Code:	MTAD18
Course Title:	Materials characterisation *Karaktärisering av material*
Credits:	7.5
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has only first-cycle course/s as entry requirements (A1N)

Major Field of Study:
MTA (Mechanical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2019-02-14, and is valid from the Autumn semester 2019 at Karlstad University.

Prerequisites
Mechanical Engineering 90 ECTS credits, including 15 ECTS credits in Materials Engineering, and English 6 or B, or equivalent

Learning Outcomes
The aim of the course is that students acquire the basic theoretical and practical knowledge of the modern methods of materials characterisation that is used in industrial and academic research and development work. The course also prepares students for further studies and for master-level degree projects in materials engineering.

Upon completion of the course students should be able to:
- explain the physical principles of the methods studied, how the methods work, what result each method

yields, and what demands are placed on specimens and specimen preparation,
- identify for each method the form the result can take (diagram, diffraction pattern, micrograph, and so on) and how to interpret it in practice,
- describe the procedure used to produce for instance IT, CCT, and phase diagrams,
- in relation to a given problem, suggest a plan for research methods to be used, motivate the choices, and explain what results they can be expected to yield.

Content
The course consists of several parts, one for each method treated. Instruction is in the form of classes, demonstrations of equipment, and a laboratory project. Participation in demonstrations and laboratory exercises is mandatory. The methods treated are optical and electron-microscopy (OM, SEM, and TEM), diffraction methods, auger spectroscopy, atomic force microscopy, and thermal analysis.

Reading List
See separate document.

Examination
Assessment is based on a written exam and an oral presentation of the laboratory project. Participation in demonstrations and laboratory exercises is mandatory.

Grades
One of the grades U (Fail), 3 (Pass), 4 (Not without Distinction), or 5 (With Distinction) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.