Reg No: MTAD23/20222

Faculty of Health, Science and Technology
Materials Engineering

Syllabus

Materials characterisation

Course Code:	MTAD23
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 2022-02-24, and is valid from the Autumn semester 2022 at Karlstad University.

Prerequisites
90 ECTS credits of completed courses in Mechanical Engineering, including 15 ECTS credits in Materials Engineering, or equivalent

Learning Outcomes
The aim of the course is for students to acquire basic theoretical and practical knowledge of modern methods for materials characterisation used in industrial and academic research and development work. The course provides a valuable basis for further study in other MA-level courses in Materials Engineering.

Upon completion of the course, students should be able to:
- explain the physical principles of the methods studied in the course, how the methods work, what type of results can be achieved for each method, and the demands placed on samples and sample preparation,

- identify the form in which results can be achieved for each method (diagrams, diffraction patterns, microstructure images, and so on), and how to interpret the results in practice,
- describe the procedure used to produce for instance IT diagrams, CCT diagrams, and phase diagrams, and
- suggest what methods to use to solve a given problem, justify their choice, and explain what type of results can be expected.

Content
The course comprises several parts, one for each method. Instruction is in the form of teaching sessions, demonstrations of equipment, and a laboratory project. Participation in projects, demonstrations, and laboratory sessions is mandatory. The methods covered are light, scan, and transmission electron microscopy, diffraction methods, and other modern methods of analysis.

Reading List
See separate document.

Examination
Assessment is based on an individual written exam, a mandatory laboratory project presented orally and in writing, and mandatory participation in demonstrations and laboratory sessions.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or U (Fail) 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.