



Faculty of Health, Science and Technology
Materials Engineering

Syllabus

Project work on future Engineering Materials

Course Code:	MTAE11
Course Title:	Project work on future Engineering Materials <i>Projektarbete kring framtidens material</i>
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 2026-02-10, and is valid from the Autumn semester 2026 at Karlstad University.

Prerequisites

Registered for Materials in industrial applications (7.5 credits), Deformation and failure (7.5 credits), and Polymer engineering (7.5 credits). Upper secondary level English 6 or English level 2. An equivalence assessment can be made.

Learning Outcomes

Upon completion of the course, students should be able to:

- demonstrate in-depth knowledge and understanding of new materials: development, properties, structure, and use,
- collect and assimilate information on engineering materials at a high technological or scientific level,
- explain the information from the perspective of a technical application,
- write, present and discuss a report at a high technological or scientific level, and
- perform as a peer reviewer of other students' projects in a seminar.

Content

The course covers examples of advanced conventional or new materials at the forefront of development such as nanomaterials, semiconductor materials, solar cell materials, and so on, in terms of development, properties, structure, and use. Materials development also takes place in a gradual processing of existing and established materials such as steel, aluminium, and powder-based materials.

The course includes lectures and one or several projects.

Lectures:

The lectures address different examples of materials choices on the basis of current technical and scientific information from different sources, with a focus on new and advanced materials. The reference materials and content of lectures can therefore vary.

Projects:

There is a great emphasis in the course on students' projects. The course may include one or several project and the students complete them individually or in small groups. Students perform a thorough information search, possibly in a combination with calculations or experiments. The focus of each project is on an advanced material or group of materials at the forefront of technical development, from perspectives of technological or scientific novelty. A theme is to be introduced in a broad sense only to be narrowed down to a particular materials engineering application or area of potential use. A current theme will be announced at each course date together with project instructions.

Reading List

See separate document.

Examination

Assessment is based on written and oral presentations of projects, and peer review of other students' projects in a seminar, as well as an individual oral examination based on questions relating to the projects and the lectures.

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 Fail (U), Pass (3), Not without Distinction (4) or Pass with Distinction (5) 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.