



Faculty of Health, Science and Technology
Materials Engineering

Syllabus

Polymer Engineering

Course Code:	MTAD22
Course Title:	Polymer Engineering <i>Polymerteknik</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 2022-08-30, and is valid from the Autumn semester 2023 at Karlstad University.

Prerequisites

Registered for Heat and Mass Transfer, 7.5 ECTS credits, Materials Engineering, 7.5 ECTS credits, Manufacturing Technology, 7.5 ECTS credits, and Finite Element Methods FEM, 7.5 ECTS credits, plus upper secondary level English 6, or equivalent

Learning Outcomes

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

- use knowledge of molecular structure to explain physical properties and recycling aspects of polymers, as well as fracture mechanical relations,
- analyse rubber-like elasticity and anisotropy in polymers,
- analyse areas of application for polymers,
- evaluate viscoelasticity in stress situations,
- evaluate mechanical properties of polymer composites, including fibre reinforcement and laminate structures, and

- evaluate and select forming technology for different components.

Content

Instruction is in the form of lectures, teaching sessions, mandatory laboratory sessions, and hand-in assignments. The course covers the structure of plastics and composite materials, thermoplastics, elastomers, thermosetting resins, additives, crystallinity, fibre length and direction, thermal properties, mechanical properties, viscoelasticity, cracks and fractures, design, construction, and manufacturing.

Reading List

See separate document.

Examination

Assessment is based on a written exam, a laboratory report, and a hand-in assignment.

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), 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.