



Faculty of Health, Science and Technology
Mechanical Engineering

Syllabus

Machine design I, Study Programme in Engineering

Course Code:	MSGB51
Course Title:	Machine design I, Study Programme in Engineering <i>Konstruktionsteknik I, högskoleingenjörsprogrammet</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
MTA (Mechanical Engineering)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2025-01-29, and is valid from the Spring semester 2026 at Karlstad University.

Prerequisites

Registered for courses in mechanics, 7.5 ECTS credits, solid mechanics, 7.5 ECTS credits, materials engineering, 7.5 ECTS credits, machine components, 7.5 ECTS credits, and manufacturing technology, 7.5 ECTS credits, or registered for the Bachelor programme in Mechanical Engineering or the Bachelor programme in Innovation and Design Engineering, or equivalent

Learning Outcomes

The aim of the course is for students to acquire knowledge of mechanical engineering design in the areas of design methods, solid modelling, and drawing.

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

Design

- give an account of the main stages of a product development process,
- give an account of the relation between shape, materials, and the manufacturing process,
- describe basic design support methods,
- independently structure, plan, and complete a design task on the basis of a given specification or requirements, including choice of materials and manufacturing method,
- use relevant assumptions and simplifications to calculate a design, and
- use sketches to present design solutions.

Solid modelling and drawing

- produce 2D drawings of details and configurations in a 3D CAD application,
- model and edit parts and configurations,
- structure variant designs using family tables and relations in a 3D CAD application, and
- structure designs using top-down functions in a 3D CAD application.

Content

Basic knowledge of the course components is provided through lectures, literature, and supervised exercises in solid modelling and drawing, both manually and in a 3D CAD application. This knowledge is then applied in individual solid modelling tasks and one or several design assignments, completed in groups. The design assignments are followed up in regular meetings that require students to submit work-in-progress. The solutions suggested by the groups are

presented orally in seminars and in written reports, structured in accordance with academic conventions.

Reading List

See separate document.

Examination

Assessment is based on hand-in assignments, completed individually and in groups, and seminars. Submissions for assessment must clearly indicate individual contributions.

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 Distinction (VG), Pass (G), or Fail (U) 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.