



Faculty of Health, Science and Technology
Mechanical Engineering

Syllabus

Introduction to Innovation and Design Engineering at Bachelor level

Course Code:	MSGA25
Course Title:	Introduction to Innovation and Design Engineering at Bachelor level <i>Introduktion till innovationsteknik och design för högskoleingenjörer</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has only upper-secondary level entry requirements (G1N)

Major Field of Study:
MTA (Mechanical Engineering)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2024-02-06, and is valid from the Autumn semester 2024 at Karlstad University.

Prerequisites

General admission requirements plus upper secondary level Physics 2, Chemistry 1, and Mathematics 3c/D, or equivalent

Learning Outcomes

The purpose of the course is for students to acquire an introduction to the subjects of Innovation Engineering and Design and a basic understanding of their continued studies and their future professional role as engineers. The course also provides students with knowledge of essential tools used in their studies.

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

Innovation and Design:

1. provide an overview of product and design processes,
2. express ideas and solutions visually through various representations,
3. plan and participate actively in group-based development projects in accordance with instructions,
4. present projects orally,
5. present projects in written reports, observing conventions of academic writing and correct language,
6. relate project work to literature,

Mechanical Engineering basics:

7. give an account of basic mechanical engineering and calculate mechanical quantities with correct units,
8. create simple drawings in 3D CAD tools,

Professional role:

9. give an account of and reflect upon the concepts of sustainable development and professional ethics from an engineering perspective, and

Study techniques:

10. give an account of and apply acquired knowledge in group dynamics and project methodology.

Content

The course is focused on a group-based product development or product analysis project, where other acquired knowledge is used.

The course covers the following:

Innovation and Design

- A group-based development project presented orally and in writing.
- Lectures on product and design processes.
- Design exercises.
- Literature studies.

Mechanical Engineering basics

- Introduction to mechanical engineering topics such as mechanics, solid mechanics, materials technology, and machine elements.
- Introduction to and use of a 3D CAD tool, as well as basics of reading technical drawings.

Professional role

- Sustainable development and ethics from the perspective of an engineer's professional role.
- Basics of commonly used digital tools for word processing, spreadsheet calculations, data handling, and presentations.
- Presentation techniques and report writing.
- Workplace visits and meetings with practicing engineers.

Study techniques

- Basics of study techniques for academic study.
- Fundamental group dynamics and project methodology.
- Overview of study administration systems and collaboration platforms.

Reading List

See separate document.

Examination

Assessment is based on an individual written hand-in assignment, a written exam, and mandatory seminars.

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.