



Faculty of Health, Science and Technology  
Mechanical Engineering

## Syllabus

### Degree Project for Master of Science in Mechanical Engineering

<b>Course Code:</b>	MSAE01
<b>Course Title:</b>	Degree Project for Master of Science in Mechanical Engineering <i>Examensarbete för civilingenjörsexamen i maskinteknik</i>
<b>Credits:</b>	30
<b>Degree Level:</b>	Master's level
<b>Progressive Specialisation:</b>	Second cycle, contains degree project for Master of Arts/Master of Science (120 credits) (A2E)

**Major Field of Study:**  
MTA (Mechanical Engineering)

#### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2021-09-02, and is valid from the Spring semester 2022 at Karlstad University.

#### Prerequisites

225 ECTS credits of programme courses completed 6 weeks before the course begins

#### Learning Outcomes

The aim of the course is that the students should:

- practice scientific methods including critical assessment, analysis and synthesis,
- apply engineering methods in identifying, formulating and solving problems with a technical relevance, and
- complete an independent project, present it orally and in writing, and critically review the work of others.

For a Master of science degree, students have to demonstrate the knowledge and skills required to work independently as an engineer.

Upon completion of the course students should be able to:

Knowledge and understanding

- demonstrate knowledge of the scientific basis and proven experience of the chosen area of technology, and insight into current research and development efforts, and
- demonstrate both broad knowledge of the chosen area of technology, including knowledge of mathematics and science, and substantial in-depth knowledge of certain aspects of the field.

Competence and skills

- demonstrate the ability to apply a holistic view to identify, formulate, and handle complex research questions critically, independently, and creatively, as well as participate in research and development work to contribute new knowledge,
- demonstrate the ability to create, analyse, and critically evaluate different technical solutions,
- demonstrate the ability to plan and carry out qualified tasks with adequate methods and within given limits,
- demonstrate the ability to integrate knowledge critically and systematically as well as model, simulate, predict, and evaluate events also with limited information,
- demonstrate the ability to develop and design products, processes, and systems, taking into account people's situations and needs as well as societal objectives for economic, social, and ecological sustainable development,
- demonstrate the ability to work in teams and collaborate in different types of groups, and
- demonstrate the ability to present and discuss their conclusions and the knowledge and arguments that underpin them clearly, orally and in writing, in dialogue with different groups, and in both national and international contexts.

Judgement and approach

- demonstrate the ability to make assessments based on relevant scientific, societal, and ethical aspects, and demonstrate awareness of ethical aspects of research and development work,
- demonstrate insight into the possibilities and limitations of technology, its role in society, and people's responsibility for its use, including social, economic, environmental, and working environment aspects, and
- demonstrate the ability to identify their own need for further knowledge and skills training.

### **Content**

The course comprises a project, completed either individually or in groups of two students if the examiner allows it. When two students collaborate on a more substantial project, the initial project plan, the written report, and the presentation of the project must clearly indicate individual contributions and responsibilities.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on documentation of the project in the form of a written report, normally written in English with a summary in Swedish, or in Swedish if the examiner allows it. Other mandatory components examined in the course include hand-in assignments, seminars, oral presentations, and peer review.

The number of assessment opportunities is limited to five, but for each specific project the

maximum is one examination and two retake examinations over one year after the start of the course, unless the examiner decides otherwise.

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.