Reg No: MSGC41/20231

Faculty of Health, Science and Technology
Mechanical Engineering

Syllabus

Engineering Design II, IoD

Course Code:	MSGC41
Course Title:	Engineering Design II, IoD *Konstruktionsteknik II, IoD*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

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 Spring semester 2023 at Karlstad University.

Prerequisites
Registered for Machine Design 1, 7.5 ECTS credits, or equivalent

Learning Outcomes
The aim of the course is for students to acquire in-depth knowledge of mechanical engineering design in the areas of design methodology, engineering design, solid modelling, and drawing production.

Design methodology
Upon completion of the course, students should be able to:
- give an account of the relation between design, materials, and the manufacturing process,
- independently structure, plan, and perform a complex design task, including choice of materials, product form, and manufacturing method, on the basis of a given requirement specification,

- choose and dimension relevant machine components in a machine construction, and
- describe and apply common design support methods.

Engineering design
Upon completion of the course, students should be able to:
- describe the engineering and scientific basics that must normally be taken into account in engineering design,
- use theory and methodology to dimension simple load-bearing mechanical constructions and machine elements,
- dimension and design simple load-bearing mechanical constructions resistant to mechanical fracture, plastic deformation, and instability such as buckling and collapse.

Solid modelling/drawing production
Upon completion of the course, students should be able to:
- model and edit complex parts and assemblies in a 3D CAD program,
- produce 2D drawings of complex details and assemblies in a 3D CAD program,
- structure complex designs with the help of so-called top-down functions in a 3D CAD program, and
- model parts and assemblies in the advanced modules of a 3D CAD program.

Content
Instruction is in the form of lectures, literature study, and supervised CAD sessions which provide basic knowledge in all three areas covered in the course. This basic knowledge is then integrated and applied in
- an independently performed design assignment focused on design methodology and CAD, and
- an independently performed dimensioning assignment focused on engineering design and the relationship between design, materials, and manufacturing.

The independent assignments are presented in seminars where the solutions presented by groups of students are discussed and assessed in relation to theory.

Reading List
See separate document.

Examination
Assessment is based on hand-in assignments, seminars, and a written exam.

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 (G) or Distinction (VG) 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.