



## COURSE SYLLABUS

# Introduction to Engineering Sciences - Bridging Course, 15 credits

*Introduction to Engineering Sciences - Bridging Course, 15 högskolepoäng*

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| <b>Course Code:</b> HIER20                         | <b>Education Cycle:</b> Second-cycle level      |
| <b>Confirmed by:</b> Utbildningsrådet May 14, 2020 | <b>Disciplinary domain:</b> Technology          |
| <b>Valid From:</b> Aug 17, 2020                    | <b>Subject group:</b> TE9                       |
| <b>Version:</b> 1                                  | <b>Specialised in:</b> A1N                      |
| <b>Reg number:</b> Department of Rehabilitation    | <b>Main field of study:</b> Product Development |

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### Intended Learning Outcomes (ILO)

Upon completion of the course the student should have the ability to:

#### Knowledge and understanding

- describe design principles of mechanical design
- explain various machine elements
- describe the working principles of Computer Aided Design (CAD) systems and various digital formats
- recognise the importance of styling in industrial design
- show familiarity with the working principles of Finite Element Method (FEM) programs.

#### Skills and abilities

- create solid and surface models in CAD
- conduct basic finite element calculations
- select and analyse machine elements such as screws and bearings
- assess the styling of individual products or product lines.

#### Judgement and approach

- appreciate the role of the results of finite element calculations for assistive technology design.

### Contents

- introduction to mechanical design
- machine elements
- introduction to CAD
- CAD modeling using SolidWorks software
- principles of industrial design
- introduction to FEM including basic calculations

### Type of instruction

The course is implemented through lectures, assignments and individual and group tutorials.

The teaching is conducted in English.

### Prerequisites

The applicant must hold the minimum of a Bachelor's degree or equivalent (i.e. the equivalent of 180 ECTS credits at an accredited university) in Prosthetics and Orthotics. Proof of English proficiency is required.

### Examination and grades

The course is graded A, B, C, D, E, FX or F.

Examination of the course will be based upon one individual written exam and individual assignments.

A senior lecturer serves as examiner for the course.

In individual written examination Fx will not be applied.

Registration of examination:

| Name of the Test        | Value       | Grading        |
|-------------------------|-------------|----------------|
| Individual written exam | 7.5 credits | A/B/C/D/E/FX/F |
| Individual assignments  | 7.5 credits | U/G            |

### Course literature

Ullman, D. (2017). *The mechanical design process*. Boston, MA: McGraw-Hill Education, Asia. ISBN 9780071267960