07.10.2022

**Curriculum at LAB University of Applied Sciences**
**2022-2023**

# Bachelor of Engineering, Mechanical Engineering 22S, Double Degree, Lappeenranta

| Code | Name | 1 y | ECTS total |
|---|---|---|---|
| **TLPRMECDD22S-1002** | **Professional Core Competences** | | **60** |
| **TLPRMECDD22S-1003** | **Transferable competences** | | **3** |
| K200CE69 | Finnish 1 | 3 | 3 |
| K200CE70 | Finnish 2 | 3 | 3 |
| **TLPRMECDD22S-1005** | **Engineering studies** | | **60** |
| AT00CH51 | Basics of Mechanical Engineering | 15 | 15 |
| AT00CH52 | Design and Manufacturing Project 1 | 12 | 12 |
| AT00CH53 | Design and Manufacturing | 20 | 20 |
| AT00CH54 | Design and Manufacturing Project 2 | 10 | 10 |
| AT00CH55 | Basics of Automation | 15 | 15 |
| AT00CH56 | Automation Project | 15 | 15 |
| KTE2110 | Project (Robotics) | 3 | 3 |
| KTE2311 | Project Related to Mechanical Engineering | 8 | 8 |
| **TLPRMECDD22S-1006** | **Complementary Competences** | | **0** |
| **TLPRMECDD22S-1008** | **LUT University Studies** | | **0** |
| **TLPRMECDD22S-1009** | **Studies IIT / SSE Program** | | **0** |
| **TLPRMECDD22S-1010** | **Practical Training** | | **10** |
| HA00CE82 | Practical Training | | 0 |
| **TLPRMECDD22S-1011** | **Thesis** | | **15** |
| AO00CE85 | Thesis Planning | | 0 |
| AO00CE86 | Thesis Research and Writing | | 0 |
| AO00CE87 | Thesis Publication | | 0 |

## TLPRMECDD22S-1002 Professional Core Competences: 60 ECTS

**Prerequisites**
According to DD-agreement

## TLPRMECDD22S-1003 Transferable competences: 3 ECTS

## K200CE69 Finnish 1: 3 ECTS

**Learning outcomes**
The student is able to
- identify and use the course vocabulary and phrases for common everyday situations
- tell about oneself and understand basic questions
- read and write simple sentences related to the course topics.

Proficiency level: A1

## K200CE70 Finnish 2: 3 ECTS

**Learning outcomes**
The student is able to
- communicate in most common everyday situations
- understand slowly and clearly spoken Finnish when the topic and the vocabulary are familiar
- understand and write a simple message or text
- use the basic vocabulary and some grammatical structures of Finnish.

Proficiency level: A1

## TLPRMECDD22S-1005 Engineering studies: 60 ECTS

**Prerequisites**
According to DD-agreement

## AT00CH51 Basics of Mechanical Engineering: 15 ECTS

**Learning outcomes**
The student
- understands the importance of the systematic product development process (including sustainability).
- recognizes the most common basic mechanical standard parts.
- understands the basic rules of technical drawing.
- understands the basic concepts of mechanics.
- knows the most common materials and manufacturing methods.

## AT00CH52 Design and Manufacturing Project 1: 12 ECTS

**Learning outcomes**
The student
- is able to read and produce technical drawings.
- understands the main principles of 3D-modelling.
- Is able to use basic concepts related to mechanics of materials in the structural design process.
- knows some advanced manufacturing methods and modern materials.
- Is able to build scale model prototypes

## AT00CH53 Design and Manufacturing: 20 ECTS

**Learning outcomes**
The student
- understands the meaning of tolerances and fits in mechanical engineering.
- knows the basic rules of designing products for manufacturing.
- is able to apply statics and mechanics of materials in the design and analysis of shafts, beams and columns.
- understands the role of dynamics and vibrations in mechanical engineering.
- Is able to use simulation software (FEM, Working Model)

## AT00CH54 Design and Manufacturing Project 2: 10 ECTS

**Learning outcomes**
The student
- is able to apply more profoundly the acquired theoretical knowledge to real work life projects.
- understands the role of technical documentation and is also able to create documents according to standards.
- is able to design a load-carrying structure (including manufacturing), e.g. a Jib Crane.

## AT00CH55 Basics of Automation: 15 ECTS

**Learning outcomes**
The student
- knows the main application areas of automation and understands the overview of the industry.
- is able to name different components of hydraulic and pneumatic systems.
- is able to make and connect hydraulic and pneumatic connections and design hydraulic and pneumatic circuits.
- is able to build and simulate a simple PLC based automation system.
- know the differences between automation solutions in different application areas of automation (especially process and piece goods automation) and the structures and main functions of automation systems.

## AT00CH56 Automation Project: 15 ECTS

**Learning outcomes**
The student
- is able to apply more deeply acquired theoretical knowledge in real working life projects.
- understands the role of technical documentation and is also able to create documents according to standards.
- is able to design a PLC-based automation system, simulate its operation and select suitable components for the system.

## KTE2110 Project (Robotics): 3 ECTS

**Learning outcomes**
The students understand the basic knowledge of robotics and its limitations. They can also apply these skills to practical situations. The students can use a robot as a part of automation.

## KTE2311 Project Related to Mechanical Engineering: 8 ECTS

**Learning outcomes**
Students will learn how to apply theoretical knowledge into real life engineering case.Target is that after the course student:understands better real life demands for mechanical engineeringcan work in multidisciplinary groupcan apply knowledge of different mechanical engineering areas into one specific project

## TLPRMECDD22S-1006 Complementary Competences: 0 ECTS

## TLPRMECDD22S-1008 LUT University Studies: 0 ECTS

## TLPRMECDD22S-1009 Studies IIT / SSE Program: 0 ECTS

## TLPRMECDD22S-1010 Practical Training: 10 ECTS

**Prerequisites**
Select such that sum of Training points from sending university and points gained in LAB is 30

## HA00CE82 Practical Training: 10 ECTS

**Learning outcomes**
The student is able to
- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence int the work done in practical training

## TLPRMECDD22S-1011 Thesis: 15 ECTS

## AO00CE85 Thesis Planning: 5 ECTS

**Learning outcomes**
The student is able to:
- describe the objectives and core contents of their thesis
- plan and describe the stages of the thesis process
- take into account the possible research permit and copyright issues.

## AO00CE86 Thesis Research and Writing: 5 ECTS

**Learning outcomes**
The student is able to:
- implement the thesis on the basis of an approved thesis plan.

## AO00CE87 Thesis Publication: 5 ECTS

**Learning outcomes**
The student is able to:
- present the results or output of their thesis
- report on their thesis in writing in accordance with the thesis guidelines of LAB University of Applied Sciences
- write a maturity test.