28.08.2024

Curriculum at LAB University of Applied Sciences 2023-2024

Bachelor of Engineering, Mechanical Engineering 23S, full-time studies, Lappeenranta

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TLPRKONE23S-1014	**CORE COMPETENCE**					**210**
TLPRKONE23S-1015	**Common Studies**					**15**
AY00BU56	Developing professional competence 1	1				1
AY00BU57	Developing professional competence 2		1			1
AY00BU58	Developing professional competence 3			1		1
A300CE13	Orientation to Sustainability Thinking	2				2
KE00BT61	English for Work		4			4
KR00BU42	Swedish for Work, Spoken		1			1
KR00BU43	Swedish for Work, Written		1			1
KS00BT59	Expert Communication Skills	4				4
TLPRKONE23S-1016	**Professional Core Competence**					**150**
TLPRKONE23S-1027	**Engineering Calculations**					**27**
AT00CX53	Engineering calculation 1	17				17
AT00CX54	Engineering calculation 2		10			10
TLPRKONE23S-1018	**Basics of Mechanical Engineering**					**13**
AT00BZ36	Basics of mechanical engineering	5				5
AT00CV78	Manufacturing Technologies 1	5				5
AT00CV82	Construction Materials	3				3
TLPRKONE23S-1019	**Engineering Drawing and Modelling**					**12**
AT00CV75	Technical Drawing and Modelling 1	8				8
AT00CV76	Technical Drawing and Modelling 2		4			4
TLPRKONE23S-1020	**Yearly Projects**					**10**
AT00CV80	Yearly Project 1	5				5
AT00CV81	Yearly Project 2		5			5
TLPRKONE23S-1021	**Machine Parts**					**14**
AT00CV77	Machine Parts		4			4
AT00CV79	Manufacturing Technologies 2		10			10
TLPRKONE23S-1022	**Automation**					**14**
AT00CV84	Basics of Hydraulics and Pneumatics		4			4
AT00CU99	Basics of Electrical Engineering		5			5

AT00CG68	IoT principles in different sectors		5			5
TLPRKONE23S-1023	**Team Learning**					**60**
AT00CV85	Team Learning 1			30		30
AT00CV86	Team learning 2			30		30
TLPRKONE23S-1024	**Practical Training**					**30**
HA00CD55	Practical Training		10			10
HA00BU60	Practical Training 2			10		10
HA00BU61	Practical Training 3				10	10
TLPRKONE23S-1025	**Thesis**					**15**
AO00BU62	Thesis Planning				5	5
AO00BU63	Thesis Project				5	5
AO00BU64	Thesis Report				5	5
TLPRKONE23S-1026	**COMPLEMENTARY COMPETENCE**					**30**
AT00CV87	Team Learning 3				30	30

TLPRKONE23S-1014 CORE COMPETENCE: 210 ECTS

TLPRKONE23S-1015 Common Studies: 15 ECTS

AY00BU56 Developing professional competence 1: 1 ECTS

Learning outcomes
The student is able to
- plan their own learning and cooperate in situations related to their own field of studies
- recognize their own competence and the needs to develop them further and to plan their careerpath observing them
- act as a group member
- operate in the learning environments of LAB University of Applied Sciences
- picture their own field of studies and its future skills- give feedback on tuition and services and thus participate in the development of education

AY00BU57 Developing professional competence 2: 1 ECTS

Learning outcomes
The student is able to
- utilize various learning opportunities in curriculum
- recognize and aim their own competences to be in level with the future career requirements
- create a study plan that supports the future career goal
- give feedback on tuition and services and thus participate in the development of education

AY00BU58 Developing professional competence 3: 1 ECTS

Learning outcomes
The student is able to
- identify themselves as a learner and develop their own learning skills
- evaluate innovative or alternative future competences required in their own field

- recognize and aim their own competences to be in level with the future career requirements
- masters the professional concepts of their own field and is able to point out their competenciesduring job recruitment processes
- give feedback on tuition and services and thus participate in the development of education

A300CE13 Orientation to Sustainability Thinking: 2 ECTS

Learning outcomes
Identify and define central concepts and frameworks related to sustainability. Recognize the interconnectedness of economic, social and environmental sustainability issues. Understand and develop own individual role in driving sustainability.

Evaluation criterias
Level 1

Pass-Fail

KE00BT61 English for Work: 4 ECTS

Learning outcomes
Proficiency level: B2

The student is able to
- communicate clearly and effectively in different generic and field-specific workplace situations both orally and in writing
- find, evaluate and use information effectively
- function collaboratively in international working environments.

KR00BU42 Swedish for Work, Spoken: 1 ECTS

Learning outcomes
The student is able to
- convey and validate arguments
- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- present their field-specific operational environment
- communicate in various working life situations in Swedish.

The student completes the Public Administration Language Test in Swedish.

KR00BU43 Swedish for Work, Written: 1 ECTS

Learning outcomes
The student is able to
- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- understand and produce various short texts related to studies and working life
- acquire information on their field in Swedish
-use online dictionaries.

The student completes the Public Administration Language Test in Swedish.

KS00BT59 Expert Communication Skills: 4 ECTS

Learning outcomes
Proficiency level: C2

The student masters Finnish language as a mother tongue in all professional spoken and written communication situations.

TLPRKONE23S-1016 Professional Core Competence: 150 ECTS

TLPRKONE23S-1027 Engineering Calculations: 27 ECTS

AT00CX53 Engineering calculation 1: 17 ECTS

Learning outcomes
The student is able to:
- understand the natural science principles related to the module
- apply mathematics used in basic mechanics and physics
- create a free-body diagram, formulate equilibrium equations, and solve them
- use linear and rotational motion equations
- understand the natural science principles related to the module
- solve normal stresses on beams
- sonduct physical measurements and prepare a proper report on the results

AT00CX54 Engineering calculation 2: 10 ECTS

Learning outcomes
The student is able to:
- understand the natural science principles related to the module
- apply mathematics used in mechanics
- solve stresses on a structure subjected to point and distributed forces
- identify different failure mechanisms and able to solve cases related to them
- identify vibration phenomena and their effects

TLPRKONE23S-1018 Basics of Mechanical Engineering: 13 ECTS

AT00BZ36 Basics of mechanical engineering: 5 ECTS

Learning outcomes
The student is able to
- work safely in a metal workshop / laboratory
- identify and name the basic components and standard parts of mechanical engineering
- uses tools and measuring instruments
- includes basic terminology related to mechanical engineering.

AT00CV78 Manufacturing Technologies 1: 5 ECTS

Learning outcomes
The student is able to
- work safely in a metal workshop / laboratory
- identify and name the basic components and standard parts of mechanical engineering
- uses tools and measuring instruments
- includes basic terminology related to mechanical engineering.

AT00CV82 Construction Materials: 3 ECTS

Learning outcomes
The student understand
- properties of various materials used in mechanical engineering
- choose the right material for the required purpose.
- knows different methods for changing the properties of materials

TLPRKONE23S-1019 Engineering Drawing and Modelling: 12 ECTS

Learning outcomes of the study module
Student
- knows machine design drawing methods and the basics of technical documentation.
- can produce good quality part and assembly drawings
- knows how to use 2D and 3D modeling softwares as design tools.

AT00CV75 Technical Drawing and Modelling 1: 8 ECTS

Learning outcomes
Student is able to
- create 3D models, parts and assemblies
- interpret drawings
- produces part and assembly drawings in accordance with the ISO standards with projections and sections
- dimension the drawings comprehensibly
- basics of tolerancing and other markings related to drawings

AT00CV76 Technical Drawing and Modelling 2: 4 ECTS

Learning outcomes
Student
- deepens modeling skills
- deepens drawing skills
- deepens knowledge of tolerances and special markings
- take into account the influence of manufacturing methods on the design

TLPRKONE23S-1020 Yearly Projects: 10 ECTS

Learning outcomes of the study module
Student
- knows the principles of project work and learns to implement, subdivide, schedule and resource the project

- knows project work tools and software

AT00CV80 Yearly Project 1: 5 ECTS

Learning outcomes
Student
- can act as part of a team of experts

- the purpose of the team is to simulate real tasks that can be encountered in mechanical engineering
- the topic of the projects varies annually

AT00CV81 Yearly Project 2: 5 ECTS

Learning outcomes
Student
- can act as part of a team of experts

- the purpose of the team is to simulate real tasks that can be encountered in mechanical engineering
- the topic of the projects varies annually

TLPRKONE23S-1021 Machine Parts: 14 ECTS

AT00CV77 Machine Parts: 4 ECTS

Learning outcomes
Student
- understands the functions of basic machine parts and knows how to select ja calculate machine parts suitable for the planned purpose.
- knows terminology related to machine parts.
- identify the most relevant factors affecting fatigue damage.
- identify fatigue design methods.

AT00CV79 Manufacturing Technologies 2: 10 ECTS

Learning outcomes
The student is able to
- understand the principles and methods of the most common welding methods
- can choose the most suitable welding method for the application
- understand the principles and execution methods of the most common plate work methods
- choose suitable plate work methods for the application
- uses concepts and terms related to welding and sheet metal work technology
- understand the principles of machining
- can choose the right cutting method for the piece in basic cases
- recognizes and can name different cutting methods and methods
- uses basic terminology and concepts related to machining.

TLPRKONE23S-1022 Automation: 14 ECTS

AT00CV84 Basics of Hydraulics and Pneumatics: 4 ECTS

Learning outcomes
The student is able to
- understand the concepts and terminology of pneumatics and hydraulics.
- understand the laws of pneumatics and hydraulics.
- recognize pneumatics and hydraulics components and their operation.
- can design simple pneumatic and hydraulic systems.

AT00CU99 Basics of Electrical Engineering: 5 ECTS

Learning outcomes
The student is able to
- recognize the fundamental electrical quantities and their interrelations
- solve simple DC and AC circuits
- explain the principle of a three-phase system and three-phase power
- describe the most common applications of electrical engineering

AT00CG68 IoT principles in different sectors: 5 ECTS

Learning outcomes
Student is able to
- descripe a structure of the IoT-system
- knowledge basics of sensors and data collection in IoT systems
- compare IoT cloud environments
- descripe requirements for IoT mobile software
- use IoT in business

TLPRKONE23S-1023 Team Learning: 60 ECTS

AT00CV85 Team Learning 1: 30 ECTS

Learning outcomes
The student
- is able to work as part of an independently functioning team
- is able to apply various methods for project planning and information collecting
- is proficient in various mechanical engineering calculation and design methods
- is able to apply knowledge provided in specific topic modules

AT00CV86 Team learning 2: 30 ECTS

Learning outcomes
The student
- is able to work as part of an independently functioning team
- is able to apply various methods for project planning and information collecting
- is proficient in various mechanical engineering calculation and design methods
- is able to apply knowledge provided in specific topic modules

TLPRKONE23S-1024 Practical Training: 30 ECTS

HA00CD55 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

HA00BU60 Practical Training 2: 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

HA00BU61 Practical Training 3: 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

TLPRKONE23S-1025 Thesis: 15 ECTS

AO00BU62 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

AO00BU63 Thesis Project: 5 ECTS

Learning outcomes

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

AO00BU64 Thesis Report: 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.

TLPRKONE23S-1026 COMPLEMENTARY COMPETENCE: 30 ECTS

AT00CV87 Team Learning 3: 30 ECTS

Learning outcomes
The student
- is able to work as part of an independently functioning team
- is able to apply various methods for project planning and information collecting
- is proficient in various mechanical engineering calculation and design methods
- is able to apply knowledge provided in specific topic modules