10.04.2024

Curriculum at LAB University of Applied Sciences 2024-2025

Bachelor of Engineering, Mechanical Engineering 24K, oline studies

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TLTIKONE24KV-1021	**CORE COMPETENCE**					**180**
TLTIKONE24KV-1001	**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
TLTIKONE24KV-1002	**Professional Core Competence**					**120**
TLTIKONE24KV-1004	**Basic studies in mathematics and physics**					**15**
AT00BT67	Basic studies in mathematics	3				3
AT00BT68	Mathematics in Technology 1	3				3
AT00BT69	Mathematics in Technology 2		3			3
AT00BT70	Basic studies in physics	3				3
AT00CZ35	Advanced studies in physics of mechanical engineering	3				3
TLTIKONE24KV-1006	**Basic studies in machinery**					**33**
AT00BV33	Basics of Manufacturing Methods	5				5
AT00BZ36	Basics of mechanical engineering	5				5
AT00BV34	Digital Tools	5				5
AT00DB64	Technical Drawing and Modelling 1	4	4			8
AT00BV37	Material's Structure and Properties	5				5
AT00BV38	Pneumatics and Hydraulics	5				5
TLTIKONE24KV-1008	**Mechanical engineering**					**15**
AT00DA82	Mechanics V	2,5	2,5			5
AT00DA83	Statics V		2,5	2,5		5
AT00DA84	Strength of Materials V		2,5	2,5		5
TLTIKONE24KV-1007	**Production technology**					**10**
AT00CV79	Manufacturing Technologies 2		10			10
TLTIKONE24KV-1009	**Basics in automation**					**10**
AT00CU99	Basics of Electrical Engineering		5			5

AT00CG68	IoT principles in different sectors		5			5
TLTIKONE24KV-1010	**Mechanical design**					**22**
AT00DB65	Technical Drawing and Modelling 2		4			4
AT00BX15	Mechanical Device and Product Design		5			5
AT00DA79	Selectioning and dimensioning of machine parts			8		8
AT00DA76	Dynamic phenomena			5		5
TLTIKONE24KV-1011	**Business and production economy**					**15**
AT00DA77	Business Operations in the Technology Industry			15		15
TLTIKONE24KV-1017	**Practical Training**					**30**
HA00BU59	Practical Training 1		10			10
HA00BU60	Practical Training 2			10		10
HA00BU61	Practical Training 3				10	10
TLTIKONE24KV-1018	**Thesis**					**15**
AO00BU62	Thesis Planning				5	5
AO00BU63	Thesis Project				5	5
AO00BU64	Thesis Report				5	5
TLTIKONE24KV-1012	**COMPLEMENTARY COMPETENCE**					**60**
TLTIKONE24KV-1019	**Industrial Maintenance**					**15**
TLTIKONE24KV-1020	**Facility Planning**					**15**
TLTIKONE24KV-1014	**Advanced studies in machinery**					**20**
AT00DA78	Machine Designing Project				5	5
AT00DA80	Industrial Economy				15	15
TLTIKONE24KV-1016	**Diversed studies**					**30**
AT00DA81	Project Learning in Enterprises				20	20

TLTIKONE24KV-1021 CORE COMPETENCE: 180 ECTS

TLTIKONE24KV-1001 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.

TLTIKONE24KV-1002 Professional Core Competence: 120 ECTS

TLTIKONE24KV-1004 Basic studies in mathematics and physics: 15 ECTS

AT00BT67 Basic studies in mathematics: 3 ECTS

Learning outcomes
Student is able to
- calculate and simulate mathematical expressions
- solve geometric and trigonometric problems
- knows bacis of vectors in plane

AT00BT68 Mathematics in Technology 1: 3 ECTS

Learning outcomes
Student is able to:
- recognise different polynomial equations, functions, and polynomial graphics
- solve inequalities
- solve simultaneous equations with the software
- solve basic space vectors
- utilise space vectors
- solve exponential and logarithm functions

AT00BT69 Mathematics in Technology 2: 3 ECTS

Learning outcomes
Student is able to:

- derivate functions and utilise derivation in practice
- integrate polynomial functions and utilise integration in practice
- solve other equations and trigonometrical problems

AT00BT70 Basic studies in physics: 3 ECTS

Learning outcomes
Student is able to
- understand the purpose of the physics in technology
- describe and utilize the SI-unit system and implement
- solve mathematical problems in kinematics, mechanics and thermodynamics
- utilize vectors

AT00CZ35 Advanced studies in physics of mechanical engineering: 3 ECTS

Learning outcomes
The student is able to
- solve mathematical tasks in vector calculations
- solve mathematical tasks in rotational motion
- carry out and report physical measurements

TLTIKONE24KV-1006 Basic studies in machinery: 33 ECTS

AT00BV33 Basics of Manufacturing Methods: 5 ECTS

Learning outcomes
Student is able to
- apply different manufacturing methods for different materials
- recognise common manufacturing methods

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.

AT00BV34 Digital Tools: 5 ECTS

Learning outcomes
Student is able to
- work in a virtual learning environment
- make reports and analyses with the help of wordprocessing and spreadheet calculation software
- use correct cloud environment individually and in a group
- carry out digital project presentation

AT00DB64 Technical Drawing and Modelling 1: 8 ECTS

Learning outcomes
The 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
- interpret general tolerances and dimensional tolerancing

AT00BV37 Material's Structure and Properties: 5 ECTS

Learning outcomes
The student knows
- the structure of the material and its effect on the properties
- different methods of modifying properties
- various models for predicting behavior of materials

AT00BV38 Pneumatics and Hydraulics: 5 ECTS

Learning outcomes
Student is able to
- use basic components in pneumatics and hydraulics
- design pneumatic application
- design hydraulic application

TLTIKONE24KV-1008 Mechanical engineering: 15 ECTS

AT00DA82 Mechanics V: 5 ECTS

Learning outcomes
Student is able to
- regognize principles of basic mechanics
- calculate simple tasks of mechanical structures

AT00DA83 Statics V: 5 ECTS

Learning outcomes
Student is able to
- determine support reactions and internal forces in statically determinate structures
- determine forces acting on pin-connected members of mechanisms in static equilibrium.

AT00DA84 Strength of Materials V: 5 ECTS

Learning outcomes
Student is able to

- calculate shear stresses
- calculate torsion and bending stresses
- calculate stresses under deformation

TLTIKONE24KV-1007 Production technology: 10 ECTS

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.

TLTIKONE24KV-1009 Basics in automation: 10 ECTS

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

TLTIKONE24KV-1010 Mechanical design: 22 ECTS

AT00DB65 Technical Drawing and Modelling 2: 4 ECTS

Learning outcomes
Student
- deepens modeling skills

- deepens drawing skills
- deepens knowledge of tolerances and special markings
- interpret geometrical tolerancing with various manufacturing methods

AT00BX15 Mechanical Device and Product Design: 5 ECTS

Learning outcomes
Student is able to
- carry design project
- calculate cost effects in design
- relate different design areas with a selected software
- use PDM system

AT00DA79 Selectioning and dimensioning of machine parts: 8 ECTS

Learning outcomes
The student can dimensioning and choose the necessary machine parts. The student is able to design the machine parts of his choice for the assembly he plans.

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.

AT00DA76 Dynamic phenomena: 5 ECTS

Learning outcomes
Student
- recognizes dynamic phenomena and knows basic theory of them
- can model and create dynamic simulations that are applied to some machines
- can choose and use different simulation softwares

TLTIKONE24KV-1011 Business and production economy: 15 ECTS

AT00DA77 Business Operations in the Technology Industry: 15 ECTS

Learning outcomes
The course is mainly intended for engineering students. The aim of the course is for the student to be able to
- the basics of cash flow in industrial companies
- examine the products and operations of industrial companies from a customer-oriented perspective
- evaluate different management methods and their impact on corporate culture
- evaluate and develop industrial companies' internal logistics and aspects related to the supply chain
- evaluate the significance of the development of different areas in order to achieve the goals of industrial companies.

TLTIKONE24KV-1017 Practical Training: 30 ECTS

HA00BU59 Practical Training 1: 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

TLTIKONE24KV-1018 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.

TLTIKONE24KV-1012 COMPLEMENTARY COMPETENCE: 60 ECTS

TLTIKONE24KV-1019 Industrial Maintenance: 15 ECTS

TLTIKONE24KV-1020 Facility Planning: 15 ECTS

TLTIKONE24KV-1014 Advanced studies in machinery: 20 ECTS

AT00DA78 Machine Designing Project: 5 ECTS

Learning outcomes
The student masters the principles of implementing a machine and equipment design project from the perspective of both project management and mechanical design.

AT00DA80 Industrial Economy: 15 ECTS

Learning outcomes
The course is mainly intended for engineering students. The aim of the course is for the student to be able to
- the basic principles of the lean method
- principles of quality tools in industrial production
- applies lean principles and quality tools in the development of industrial operations.

TLTIKONE24KV-1016 Diversed studies: 30 ECTS

AT00DA81 Project Learning in Enterprises: 20 ECTS

Learning outcomes
Student is able to
- use professional competencies in expert and supervising duties
- document and report personal professional development