17.02.2025

Curriculum at LAB University of Applied Sciences
2025-2026

Bachelor of Engineering, Wood Technology (in Finnish) 25S, full-time studies, Lahti

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TLTIPUU25S-1001	**CORE COMPETENCE**					**180**
TLTIPUU25S-1030	**Common Studies**					**5**
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
TLTIPUU25S-1022	**Language and Communication Studies**					**15**
KS00DD59	Expert Communication Skills	5				5
KE00DD60	English for Engineering	5				5
KR00DD61	Swedish for Work, Written		2			2
KR00BU42	Swedish for Work, Spoken		1			1
KE00DD58	Intercultural Competence		2			2
TLTIPUU25S-1033	**Mathematics**					**15**
AT00DC94	Basics of Algebra	3				3
AT00DD73	Geometry and Vectors	3				3
AT00DC97	Functions and Equations		3			3
AT00DF33	Derivation and Integration		3			3
AT00DC99	Statistical Mathematics			3		3
TLTIPUU25S-1032	**Physics and Chemistry**					**10**
AT00BT70	Basic studies in physics	3				3
AT00DE25	Wood Technology Physics		3			3
AT00DD02	Basic Chemistry	4				4
TLTIPUU25S-1003	**Professional Core Competence**					**90**
TLTIPUU25S-1039	**Sustainable Forestry**					**15**
AT00DE87	Wood-based Material Flows	5				5
AT00DE88	Sustainable Wood Products Industry	5				5
AT00DG37	Wood Structure and Properties	5				5
TLTIPUU25S-1040	**Wood-based Materials in Construction**					**15**
AT00DE89	Wood-based Products		10			10
AT00DE90	Use of Wood in Construction		5			5
TLTIPUU25S-1035	**Sawmill Industry**					**15**

AT00DE65	Introduction to Process Engineering	5				5
AT00DG16	Sawmill Industry		5			5
AT00DC80	Drying and Thermal Modification		5			5
TLTIPUU25S-1025	**Wood-based Panels Industry**					**15**
AT00BZ12	Plywood and LVL technology			5		5
AT00BZ13	Particle board, MDF, OSB and other wood-based panels			5		5
AT00DE63	Product and Business Idea Design			5		5
TLTIPUU25S-1036	**Furniture Industry**					**15**
AT00DG40	Furniture Industry			5		5
AT00DF70	Product Design Project			5		5
AT00DF93	Research Methods and Reporting			5		5
TLTIPUU25S-1038	**Digital Applications**					**15**
AT00DE86	Woodworking and Work Safety	5				5
AT00BZ07	Machine Drawing and 3D Design	5				5
AT00BZ08	CAD/CAM and 3D printing	5				5
TLTIPUU25S-1009	**Practical Training**					**30**
HA00CD55	Practical Training		10			10
HA00BU60	Practical Training 2		5	5		10
HA00BU61	Practical Training 3			10		10
TLTIPUU25S-1010	**Thesis**					**15**
AO00BU62	Thesis Planning				5	5
AO00BU63	Thesis Project				5	5
AO00BU64	Thesis Report				5	5
TLTIPUU25S-1011	**COMPLEMENTARY COMPETENCE**					**60**
TLTIPUU25S-1050	**Multipurpose Biomaterials**					**15**
AT00DF62	Introduction to Biomaterials					0
AT00DF61	Bioproducts and their Manufacturing					0
AT00DD27	Utilization of Side Streams and Waste Prevention					0
TLTIPUU25S-1059	**Production Economy**					**15**
TLTIPUU25S-1060	**Automation and Mechanical Engineering**					**15**
TLTIPUU25S-1052	**Wood Product Industry**					**15**
AT00BZ24	Wood products in building industry					0
AT00CU23	Global wood business					0
AT00CU24	Wood architecture					0
TLTIPUU25S-1026	**Sustainable Solution Engineering Program Studies**					**15**
TLTIPUU25S-1061	**Project Studies**					**15**
AT00DG21	Project Studies					0
AT00DG22	Project Studies 2					0
AT00DG23	Project Studies 3					0
TLTIPUU25S-1062	**Elective Studies**					**15**

TLTIPUU25S-1001 CORE COMPETENCE: 180 ECTS

TLTIPUU25S-1030 Common Studies: 5 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

TLTIPUU25S-1022 Language and Communication Studies: 15 ECTS

KS00DD59 Expert Communication Skills: 5 ECTS

Learning outcomes
The student is able to
- identify and assess their communication skills and give, receive and use feedback to develop their communication skills
- act purposefully, appropriately and skilfully in communication and interaction situations in work life and in his/her professional field (text, presentation and group communication skills)
- take into account the requirements of the recipient/interaction partner, the situation and the field in which they are communicating
- communicate in a structured, understandable and convincing way
- develop their Finnish language and communication skills as part of their expertise and professional competence (willingness and motivation to continuously learn and develop communication skills).

KE00DD60 English for Engineering: 5 ECTS

Learning outcomes
The student is able to
- perform effectively and professionally when applying for a job
- read and process basic texts from their field
- use and find vocabulary from their field
- communicate successfully and professionally about basic topics from their field
- communicate and work in an international environment

KR00DD61 Swedish for Work, Written: 2 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.

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.

KE00DD58 Intercultural Competence: 2 ECTS

Learning outcomes
The student is able to
- understand cultural similarities and differences using theoretical frameworks
- has skills and competences to develop their intercultural sensitivity
- understand culture adaptation and adjustment.

TLTIPUU25S-1033 Mathematics: 15 ECTS

AT00DC94 Basics of Algebra: 3 ECTS

Learning outcomes
The student is able to
- simplify and handle mathematical expressions
- solve basic equations and system of two linear equations
- basics of percentage calculation

AT00DD73 Geometry and Vectors: 3 ECTS

Learning outcomes
The student is able to
- solve the angles and sides of different types of triangles and use similarity
- solve geometric problems
- knows basics of vectors in plane and space

AT00DC97 Functions and Equations: 3 ECTS

Learning outcomes
The student is able to
- identify different types of functions and their graphs
- methods for solving inequalities and special equations
- system of equations and matrices

AT00DF33 Derivation and Integration: 3 ECTS

Learning outcomes
The student is able to
- basics of derivation and applied in optimization
- basics of integrals and apply integration to calculate areas and volumes

AT00DC99 Statistical Mathematics: 3 ECTS

Learning outcomes
The student is able to
- basics of probability calculation and statistical mathematics
- use the software as a data analysis tool

TLTIPUU25S-1032 Physics and Chemistry: 10 ECTS

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

AT00DE25 Wood Technology Physics: 3 ECTS

Learning outcomes
Student is able to:
- solve mathematical problems in electrical sciences and thermodynamics
- conduct physical measurements and draft a proper report on their findings
- apply digitalisation in the processing of results

AT00DD02 Basic Chemistry: 4 ECTS

Learning outcomes
The student is able to
- to understand the meaning of the chemistry as an essential part of engineering
- to know the atomic structure and chemical bonds
- to describe and identify common inorganic compounds as well as the groups and structures of organic compounds.
- to use the basic chemical equations and reactions
- use the electrochemical series of metals
- to compute acid and base calculations s and explain the basics related to acid-base titration

TLTIPUU25S-1003 Professional Core Competence: 90 ECTS

TLTIPUU25S-1039 Sustainable Forestry: 15 ECTS

AT00DE87 Wood-based Material Flows: 5 ECTS

Learning outcomes
The student is able to

- assess the efficient use of wood raw material in different production processes
- understand the properties and potential uses of wood in different areas of industry
- identify the key stages of the wood products industry, pulp and bioenergy production and understand
their significance in the industry
- identify new opportunities in the utilization of bio- and wood-based materials in different industries
- apply the principles of the circular economy in the development of wood-based products and assess
the impacts of material recycling
- analyse the origin and environmental impacts of materials in a consumer product
- describe the manufacturing processes of the wood products industry, pulp and paper and assess their
environmental impacts
- be familiar with bioenergy production technologies and assess their sustainability

AT00DE88 Sustainable Wood Products Industry: 5 ECTS

Learning outcomes
The student is able to
- understand the basics of tree growth and harvesting
- evaluate the use of wood as a renewable natural material
- energy, material use (mechanical and chemical)
- forests as a natural resource
- silviculture and forest regeneration
- evaluate the ecological impacts of wood use
- describe the basic structure of wood
- describe the structure of wood at the cellular level

AT00DG37 Wood Structure and Properties: 5 ECTS

Learning outcomes
The student is able to
- explain the following terms: wood grain saturation point (WSP), wood equilibrium moisture, wood hygroscopicity and anisotropy
- describe the structure of wood at the cell wall level
- the specific features of the interaction between wood and moisture
- factors affecting the physical properties of wood
- take the specific features of wood into account in the use and applications of wood
- describe how wood properties affect wood gluing and surface treatment
- master the basics of the most common wood product manufacturing processes

TLTIPUU25S-1040 Wood-based Materials in Construction: 15 ECTS

AT00DE89 Wood-based Products: 10 ECTS

Learning outcomes
The student is able to

- compare the properties of the most common wood adhesives and wood surface treatment agents and choose the appropriate adhesive or surface treatment for different applications
- investigate and test the properties of wood gluing and surface treatment
- identify the most important gluing and surface treatment processes of wood products
- identify the most important construction carpentry products and their manufacturing processes
- identify the most important wood-based structural products and their manufacturing processes
- identify the most important wood-based interior decoration products and their manufacturing processes
- understand the principles of the design, use, installation and maintenance of wood-based products
- see the importance of geographical and cultural differences and differences in the use of wood-based products
- sales processes of wood-based structural and interior decoration products and construction carpentry products

AT00DE90 Use of Wood in Construction: 5 ECTS

Learning outcomes
The student is able to
- identify and assess the suitability of different wood materials in the construction of log houses, wooden elements and modular buildings
- the properties and structures of log houses, wooden elements and modular buildings
- the production processes of log houses, wooden elements and modular buildings
- the sales processes of log houses, wooden elements and modular buildings

TLTIPUU25S-1035 Sawmill Industry: 15 ECTS

AT00DE65 Introduction to Process Engineering: 5 ECTS

Learning outcomes
The student is able to
- interpret line and process diagrams
- conduct risk assessments, including HAZOP and HAZID
- implement design concepts from initiation through completion
- understand the role of predictive maintenance
- understand the principles of Lean Manufacturing, Green Engineering, and Best Available Techniques (BAT)
- understand how, especially SDGs 8, 9, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DG16 Sawmill Industry: 5 ECTS

Learning outcomes
The student is able to
- basics of the sawmill industry, Finnish forests and forestry
- basics of wood raw material and procurement
- forest certification in trading (PEFC & FSC)
- planning processes for the manufacture and production of sawn timber
- further processed products

- sales and marketing of wood products
- logistics and Incoterms
- R&D - the development of wood products over the years
- use of wood in construction

AT00DC80 Drying and Thermal Modification: 5 ECTS

Learning outcomes
The student is able to
- basics of wood drying
- Industrial wood drying and its processes
- firewood and its manufacturing process
- basic wood drying invoices
- targets for wood drying in different applications
- other methods of drying wood, drying defects

TLTIPUU25S-1025 Wood-based Panels Industry: 15 ECTS

AT00BZ12 Plywood and LVL technology: 5 ECTS

Learning outcomes
The student is able to
- describe the manufacturing processes of plywood and LVL board products
- know the main end uses of both board type
- define the technical properties of both board types
- know the further processing possibilities of both board types
- produce plywood in laboratory environment and make standard quality tests

AT00BZ13 Particle board, MDF, OSB and other wood-based panels: 5 ECTS

Learning outcomes
The student is able to
- describe the manufacturing processes of particleboard, MDF and OSB board products
- know the main end uses of each board type
- define the technical properties of different board types
- know the further processing possibilities of different board types
- produce particleboard in laboratory environment and make standard quality tests

AT00DE63 Product and Business Idea Design: 5 ECTS

Learning outcomes
The student is able to
- apply business idea, product development and innovation methods, incorporating Ecodesign principles and regulatory frameworks
- use the Business Model Canvas to develop and evaluate business models, including circular economy approaches
- create and deliver presentations on product concepts, receiving and incorporating feedback for

improvement
- implement participatory design and co-creation methods to involve stakeholders in developing sustainable solutions
- analyse ethical considerations in innovation and leverage open innovation and crowdsourcing to support sustainable product and business development
- understand how, especially SDGs 8, 9, 12 & 17, are linked to the course´s themes to promote more sustainable solutions

TLTIPUU25S-1036 Furniture Industry: 15 ECTS

AT00DG40 Furniture Industry: 5 ECTS

Learning outcomes
The student is able to
- name Finnish furniture designers and their products
- describe products and their production methods in the furniture industry
- describe the operating environment of the furniture industry
- evaluate the operational strategies of companies in the sector
- analyze the Finnish furniture industry and its future

AT00DF70 Product Design Project: 5 ECTS

Learning outcomes
The student is able to
- utilize ideation tools in design
- apply the design process to their design work
- use technical drawing tools to support design
- combine design and technical design requirements into a functional whole
- work effectively in a group and make their expertise available to the design team
- use the equipment and tools needed for model building in the manufacture of a wooden product
- select and implement a suitable surface treatment for the product, taking into account the requirements of the operating environment
- take into account environmental and occupational health and safety aspects

AT00DF93 Research Methods and Reporting: 5 ECTS

Learning outcomes
The student is able to
- recognize the phases of the thesis process and the structure of a research plan
- conduct information searches and critically evaluate sources
- describe the key research methods and the principles of research ethics applicable to their field of study
- design and conduct a small-scale research exercise on a selected topic
- analyze the collected research data, assess the reliability of the results, and draw conclusions
- report the research exercise applying the thesis writing guidelines

TLTIPUU25S-1038 Digital Applications: 15 ECTS

AT00DE86 Woodworking and Work Safety: 5 ECTS

Learning outcomes
The student will be able to
- describe the basics of woodworking
- describe the machines and equipment used in woodworking
- choose suitable machining methods for different stages of product manufacturing
- use laboratory machines in accordance with occupational safety regulations
- act in accordance with the organization's safety instructions in laboratory facilities

AT00BZ07 Machine Drawing and 3D Design: 5 ECTS

Learning outcomes
The student is able to
- basics of technical drawing
- basics of CAD drawing
- read, edit and create technical 2D drawings
- basics of 3D modeling
- create technical drawings in a 3D environment and visualize 3D assemblies

AT00BZ08 CAD/CAM and 3D printing: 5 ECTS

Learning outcomes
The student is able to
- Key concepts and features of CNC technology
- basics of CAD / CAM technology
- create CNC toolpaths using CAM software
- machine the planned toolpath with a CNC milling machine
- model the plan as a 3D model and print the model on a 3D printer

TLTIPUU25S-1009 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

TLTIPUU25S-1010 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.

TLTIPUU25S-1011 COMPLEMENTARY COMPETENCE: 60 ECTS

TLTIPUU25S-1050 Multipurpose Biomaterials: 15 ECTS

AT00DF62 Introduction to Biomaterials: 5 ECTS

Learning outcomes
The student is able to
- understand the fundamentals of the circular bioeconomy and recognize the potential of biomaterials from the perspectives of environmental impact and national economy
- identify key biobased raw materials and side streams, assess their quantities and availability, and describe the products manufactured from them
- describe the properties and characteristics of key biobased raw materials and side streams and their impacts on the production, use, and recycling of biomaterials
- assess the suitability of biobased raw materials and side streams for the production of various bioproducts

AT00DF61 Bioproducts and their Manufacturing: 5 ECTS

Learning outcomes
The student is able to
- identify key bioproducts and describe their properties, applications, and significance
- understand the fundamentals of physical and chemical unit processes used in bioproduct manufacturing
- describe the configuration and operation of common bioproduct plants (biorefineries)
- understand the principles of the selected bioproduct manufacturing process and analyze the factors affecting its profitability and environmental impact

AT00DD27 Utilization of Side Streams and Waste Prevention: 5 ECTS

Learning outcomes
The student is able to
- identify key side streams in the food system and forest industry, as well as the sources of loss
- analyze the suitability of side streams as raw materials for various low- and high-value-added products
- evaluate the economic benefits of side stream utilization and waste prevention (through profitability calculations) and the environmental benefits (through life cycle assessment).
- design a process or a study for the utilization of a selected side stream

TLTIPUU25S-1059 Production Economy: 15 ECTS

TLTIPUU25S-1060 Automation and Mechanical Engineering: 15 ECTS

TLTIPUU25S-1052 Wood Product Industry: 15 ECTS

AT00BZ24 Wood products in building industry: 5 ECTS

Learning outcomes
The student is able to
- know the possibilities and limitations of LVL for building industry
- know the possibilities and limitations of plywood for building industry
- know the possibilities and limitations of CLT for building industry
- know the possibilities and limitations of gluelam for building industry
- overview of other Wood Products used in construction
- describe key production equipment and functions for different applications

AT00CU23 Global wood business: 5 ECTS

Learning outcomes
Student understands
- the global nature of modern wood products business.
- the combination of local nature of production through raw materials against varying demands in different parts of the globe
- competitive product and service offerings
- logistic options and challenges
- future trends and possibilities for the industry

AT00CU24 Wood architecture: 5 ECTS

Learning outcomes
The student is able to
- history of wood in architecture
- regional differences
- future vision for use of wood and other natural material in architecture

TLTIPUU25S-1026 Sustainable Solution Engineering Program Studies: 15 ECTS

TLTIPUU25S-1061 Project Studies: 15 ECTS

AT00DG21 Project Studies: 5 ECTS

Learning outcomes
The student is able to
- apply professional competence related to their degree in practical expert and supervisory tasks
- document and report on the development of professional competence
- use project-related concepts consistently and justify their actions based on the knowledge base
- investigate the starting points, needs and foundations of the project's activities
- act goal-oriented, evaluate the activities and make development proposals
- apply a variety of different techniques, methods and working methods in the project
- act safely, ethically and customer-oriented
- act responsibly and goal-oriented in a group and in other interaction situations required by the project

AT00DG22 Project Studies 2: 5 ECTS

Learning outcomes
The student is able to
- apply professional competence related to their degree in practical expert and supervisory tasks
- document and report on the development of professional competence
- use project-related concepts consistently and justify their actions based on the knowledge base
- investigate the starting points, needs and foundations of the project's activities
- act goal-oriented, evaluate the activities and make development proposals
- apply a variety of different techniques, methods and working methods in the project
- act safely, ethically and customer-oriented
- act responsibly and goal-oriented in a group and in other interaction situations required by the project

AT00DG23 Project Studies 3: 5 ECTS

Learning outcomes
The student is able to
- apply professional competence related to their degree in practical expert and supervisory tasks
- document and report on the development of professional competence
- use project-related concepts consistently and justify their actions based on the knowledge base
- investigate the starting points, needs and foundations of the project's activities
- act goal-oriented, evaluate the activities and make development proposals
- apply a variety of different techniques, methods and working methods in the project
- act safely, ethically and customer-oriented
- act responsibly and goal-oriented in a group and in other interaction situations required by the project

TLTIPUU25S-1062 Elective Studies: 15 ECTS