02.06.2022

Curriculum at LAB University of Applied Sciences
2020-2021

Bachelor of Engineering, Wood Technology, full-time studies, Lahti

Code	Name	1 y	2 y	3 y	4 y	ECTS total
PUU20SLTI-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
AY00BT63	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
PUU20SLTI-1002	**Professional Core Competence**					**135**
PUU20SLTI-1006	**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
AT00BZ00	Wood technology physics	3				3
PUU20SLTI-1007	**Basic studies in Wood Engineering**					**15**
AT00BZ01	Helth and Safety in Wood Laboratory Environment	5				5
AT00BZ02	Forest and Raw Materials	5				5
AT00BZ03	Wood Processing	5				5
PUU20SLTI-1009	**Wood material technologies**					**15**
AT00BZ04	Glueing	5				5
AT00BZ05	Surface Treatment	5				5
AT00BZ06	Wood Construction	5				5
PUU20SLTI-1010	**Digital Tools**					**15**
AT00BV34	Digital Tools	5				5
AT00BZ07	Machine Drawing and 3D Design	5				5
AT00BZ08	CAD/CAM and 3D printing		5			5
PUU20SLTI-1011	**Sawmill industry**					**15**
AT00BZ09	Sawn timber production and processes		5			5
AT00BZ10	Timber based products		5			5

AT00BZ11	Drying and thermal modification		5			5
PUU20SLTI-1012 Wood-based Panels Industry						**15**
AT00BZ12	Plywood and LVL technology			5		5
AT00BZ13	Particle board, MDF, OSB and other wood-based panels			5		5
AT00BZ14	R&D Project			5		5
PUU20SLTI-1013 Furniture Industry						**15**
AT00BZ15	Furniture Industry		5			5
AT00BZ16	Industrial Processes and Production		5			5
AT00BZ17	Product Development Project		5			5
PUU20SLTI-1014 Business and Economics						**15**
AT00BZ18	Sales and Marketing			5		5
AT00BZ19	Business economics			5		5
AT00BZ20	Research Seminar			5		5
PUU20SLTI-1015 Production Automation and Management						**15**
AT00CG68	IoT principles in different sectors		5			5
AT00BZ23	Automation and Digitalisation		5			5
AL00CD63	Management and Leadership		5			5
PUU20SLTI-1003 Complementary Competence						**45**
PUU20SLTI-1016 Wood product industry						**15**
AT00BZ24	Wood product in building industry				5	5
AT00BZ25	Improvements in production technology				5	5
AT00BZ26	Products for end use applications				5	5
PUU20SLTI-1025 CNC technology in wood industries						**15**
AT00CT27	CNC programming basics			5		5
AT00CT28	CNC programming advanced			5		5
AT00CT29	CNC project			5		5
PUU20SLTI-1018 Production economy						**15**
AT00BZ30	LEAN and 5S				5	5
AL00CE39	Logistics and Supply Chain Management				5	5
AT00CT26	Production Management				5	5
PUU20SLTI-1024 Studio: Material						**20**
AM00CM38	Material Studio 1				10	10
AM00CM39	Material Studio 2				10	10
PUU20SLTI-1019 Global wood business						**15**
AT00BZ33	Product demands in different areas			5		5
AT00BZ34	Competitive product			5		5
AT00BZ35	Global players and future vision			5		5
PUU20SLTI-1023 Versatile Studies						**0**
AT00CB83	Project Learning in Enterprises					0
PUU20SLTI-1004 Practical Training						**30**

HA00BU59	Practical Training 1		10			10
HA00BU60	Practical Training 2			10		10
HA00BU61	Practical Training 3				10	10
PUU20SLTI-1005 Thesis						**15**
AO00BU62	Thesis Planning				5	5
AO00BU63	Thesis Project				5	5
AO00BU64	Thesis Report				5	5

PUU20SLTI-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

AY00BT63 Orientation to Sustainability Thinking: 2 ECTS

Learning outcomes

The student is able to
- 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

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.

PUU20SLTI-1002 Professional Core Competence: 135 ECTS

PUU20SLTI-1006 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

AT00BT68 Mathematics in Technology 1: 3 ECTS

Learning outcomes
Student is able to:
- regognise different polynomial equations and polynomial graph
- 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
- solve challenging functions
- solve basic derivation functions and utilise derivation in practice
- solve integrated polynomial functions and utilise integration in practice
- solve 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

AT00BZ00 Wood technology physics: 3 ECTS

Learning outcomes
Student is able to:
- describe the electronic phenomena behind the development of technology
- solve mathematical problems in electrical sciences

- conduct physical measurements and draft a proper report on their findings
- apply digitalisation in the processing of results

PUU20SLTI-1007 Basic studies in Wood Engineering: 15 ECTS

AT00BZ01 Helth and Safety in Wood Laboratory Environment: 5 ECTS

Learning outcomes
The student is able to:
- use laboratory machines in accordance with safety regulations
- operate in accordance with the organisation's safety instructions in the laboratory facilities
- describe issues related to occupational safety about the safety and health of the working environment
- search for and use safety data sheets for harmful and dangerous substances
- describe the principles of occupational safety and health in the workplace

AT00BZ02 Forest and Raw Materials: 5 ECTS

Learning outcomes
The student is able to:
-basics related to tree growth and harvesting
-evaluate the use of wood as a renewable natural material
-evaluate the ecological impact of wood use
-Describe the basic structure of the tree
-describe the structure of a tree at the cellular level

AT00BZ03 Wood Processing: 5 ECTS

Learning outcomes
Student is able to:
- describe the basics related to woodworking
- discuss woodworking blades and blade materials with the blade supplier
- make choices about woodworking methods with the goal of profitable business and high-quality woodworking results
- describe the machines and equipment used for woodworking
- select suitable woodworking methods for the various stages of manufacturing a product

PUU20SLTI-1009 Wood material technologies: 15 ECTS

AT00BZ04 Glueing: 5 ECTS

Learning outcomes
The student is able to:
- describe the basic phenomena (chemistry) affecting wood gluing
- define the factors influencing gluing
- compare the properties of the most common wood glues
- choose a suitable adhesive for different applications

AT00BZ05 Surface Treatment: 5 ECTS

Learning outcomes
The student is able to:
- describe basic phenomena related to wood surface treatment (chemistry)
- pre-treat the wood surface
- compare the properties of surface treatment agents and application and drying methods
- taking into account environmental and occupational safety aspects
- use film coating methods

AT00BZ06 Wood Construction: 5 ECTS

Learning outcomes
Student is able to:
-describe the structure of wood at the level of cell wall
-describe specific features of the interaction between wood and moisture
-describe how the structure of wood affects its properties
-take special characteristics of the wood into consideration in its various uses
-manage the basics of the manufacturing processes of the most common wood products

PUU20SLTI-1010 Digital Tools: 15 ECTS

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

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.

PUU20SLTI-1011 Sawmill industry: 15 ECTS

AT00BZ09 Sawn timber production and processes: 5 ECTS

Learning outcomes
The student is able to:
- basics of the sawmill industry, Finnish forests and forestry
- basics of wood raw material and wood raw material procurement
- forest Certification Criteria (PEFC & FSC)
- sawn timber manufacturing: the production planning process
- further developed products, substitutes and competitors
- sales and marketing of wood products
- logistics and incoterms clauses
- R&D - development of wood products over the years
- use of wood in construction.

AT00BZ10 Timber based products: 5 ECTS

Learning outcomes
The student is able to:
- recognises most important timber based building products
- recognises most importat timber based interior products
- understands the principles of timber based products’ design and planning, use, installation and maintenance
- see the differences in timber based products’ use in different geographic and cultural areas

AT00BZ11 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

PUU20SLTI-1012 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

AT00BZ14 R&D Project: 5 ECTS

Learning outcomes
The student is able to:
- make a project plan including time schedule, responsibilities and target setting
- learn customer communication
- search for professional literature to support the project
- report on the project results and analyse them
- make seminar presentation to customer

PUU20SLTI-1013 Furniture Industry: 15 ECTS

AT00BZ15 Furniture Industry: 5 ECTS

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

AT00BZ16 Industrial Processes and Production: 5 ECTS

Learning outcomes
Student is able to:
- name the various production processes of the furniture industry
- describe production planning and control methods
- discuss the importance of different factors of production as part of layout design

- describe the principles of lean thinking and activities
- describe the principles of investment accounting and its significance for the company's profitability

AT00BZ17 Product Development Project: 5 ECTS

Learning outcomes
Student is able to:
- use brainstorming tools when designing the product development project
- utilise the product design process in his/her own project work
- use technical drawing tools in designing the product
- combine design and technical design
- work in a group and bring his/her expertise to the benefit of the design team

PUU20SLTI-1014 Business and Economics: 15 ECTS

AT00BZ18 Sales and Marketing: 5 ECTS

Learning outcomes
The student is able to:
- basic concepts of sales and marketing
- understands the differences between B2B and B2C
- understands the concept of branding
- basics of advertising
- the importance of logistics to businesses

AT00BZ19 Business economics: 5 ECTS

Learning outcomes
The student is able to:
- understand the basics of business mathematics
- price a product and understand the effects of different factors on price formation
- understand the importance of business economics for the success of a company
- assess a company's profitability, solvency and productivity in the light of key indicators

AT00BZ20 Research Seminar: 5 ECTS

Learning outcomes
Student is able to:
- acquire and utilise research-related information and use sources appropriately
- follow ethical principles in research activities
- use the most typical research and development methods in his/her field
- write a scientific report with appropriate language, style and referencing

PUU20SLTI-1015 Production Automation and Management: 15 ECTS

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

AT00BZ23 Automation and Digitalisation: 5 ECTS

Learning outcomes
The student is able to:
- definition of automatic production machine or line
- production recipe and recipe processing for automation
- automatic product change on the production line
- benefits and requirements of automation
- the opportunities for digitalisation now and in the future

AL00CD63 Management and Leadership: 5 ECTS

Learning outcomes
Students knows:
- key management & leadership models and methods.
- the characteristics of modern management & leadership and the importance of the organization of the work community.
- the diverse field of responsibilities of managers and their own role in it.
- basics of labor law

PUU20SLTI-1003 Complementary Competence: 45 ECTS

PUU20SLTI-1016 Wood product industry: 15 ECTS

AT00BZ24 Wood product 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
- describe key production equipment and functions for different applications

AT00BZ25 Improvements in production technology: 5 ECTS

Learning outcomes
The student is able to:

- know the possibilities and limitations of plywood machinery in production line
- know the possibilities and limitations of LVL machinery in production line
- define production bottle necks and improvement possibilities in plywood and LVL production
- know the measurements devices and high-end applications in plywood and LVL production lines
- know the next generation machine and technology development possibilities

AT00BZ26 Products for end use applications: 5 ECTS

Learning outcomes
The student is able to:
- know different production possibilities for end use products
- define product development cost structure and make development feasibility study
- innovate new wood based products for different end-use applications
- execute project related to wood based products for different end-use applications
- make extensive project reporting

PUU20SLTI-1025 CNC technology in wood industries: 15 ECTS

AT00CT27 CNC programming basics: 5 ECTS

Learning outcomes
The student is able to:
- make and modify geometry
- define toolpaths (milling)
- make vertical and horizontal milling and drilling
- create and use variables
- create tools, tool values and specifications
- define workpiece mountings
- make simple CNC-programs

AT00CT28 CNC programming advanced: 5 ECTS

Learning outcomes
The student is able to:
- set up and use automatic workflow and macros
- make use of 3D grafics
- use and make benefit of global variables
- make DXF and 3D-Solid import
- make parametric conditions and equations
- make parametric CNC-programs

AT00CT29 CNC project: 5 ECTS

Learning outcomes
The student is able to:
- make a project plan including time schedule, responsibilities and target setting
- make 3D design of a product

- make CNC programming for selected product
- manufacture the product with CNC machine
- make project report and seminar presentation

PUU20SLTI-1018 Production economy: 15 ECTS

AT00BZ30 LEAN and 5S: 5 ECTS

Learning outcomes
The student is able to:
- know LEAN and 5S principles
- define how to use LEAN and 5S in production management
- define production line information collection typically related to LEAN and 5S
- know LEAN and 5S tools
- know improvement possibilities in production line by LEAN and 5S

AL00CE39 Logistics and Supply Chain Management: 5 ECTS

Learning outcomes
Student is able to

-use basic concepts of logistics and supply chain management.
- the principles of value chain formation.
- identify the impact of logistics and supply chains on the company's profitability and competitiveness.
- describe the importance of customer orientation and stakeholder cooperation throughout the supply chain.

AT00CT26 Production Management: 5 ECTS

Learning outcomes
The student is able to:
- define key concepts and development methods related to production and production strategy
- development of production strategy and methods
- development of production infrastructure
- development a supply chain strategy

PUU20SLTI-1024 Studio: Material: 20 ECTS

AM00CM38 Material Studio 1: 10 ECTS

Learning outcomes
The student is able to
- design wood or fibre material based products and structures
- apply the physiological properties of the material as a basis of design
- create models of the designs
- design products using contemporary materials.

AM00CM39 Material Studio 2: 10 ECTS

Learning outcomes
The students are able to
- choose appropriate manufacturing methods and techniques for their design
- create designs that utilize the visual aesthetics of the material
- design manufacturable products and create documentation needed for manufacturing
- work as a designer in materials-based product development.

PUU20SLTI-1019 Global wood business: 15 ECTS

AT00BZ33 Product demands in different areas: 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

AT00BZ34 Competitive product: 5 ECTS

Learning outcomes
Student understands
- competitive product and service offerings

AT00BZ35 Global players and future vision: 5 ECTS

Learning outcomes
Student understands
- logistic options and challenges
- future trends and possibilities for the industry

PUU20SLTI-1023 Versatile Studies: 0 ECTS

AT00CB83 Project Learning in Enterprises: 15 ECTS

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

PUU20SLTI-1004 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

PUU20SLTI-1005 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.