10.12.2024

Curriculum at LAB University of Applied Sciences
2025-2026

Bachelor of Engineering, Sustainable Solutions Engineering 25S, full-time studies, Lahti

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TLTISSE25S-1001	**CORE COMPETENCE**					**182**
TLTISSE25S-1032	**Common Studies**					**7**
AY00CE71	Developing Professional Competences 1	3				3
AY00CE72	Developing Professional Competences 2		1			1
AY00CE73	Developing Professional Competences 3			1		1
A300CE13	Orientation to Sustainability Thinking	2				2
TLTISSE25S-1027	**Language and Communication Studies for English Students**					**15**
K200CE69	Finnish 1	3				3
K200CE70	Finnish 2	3				3
K200DD57	Finnish for Technology	2				2
KE00CE75	English for Professional Communication	5				5
KE00DD58	Intercultural Competence	2				2
TLTISSE25S-1028	**Language and Communication Studies for Finnish Students**					**15**
KS00DD59	Expert Communication Skills	5				5
KR00DD61	Swedish for Work, Written		2			2
KR00BU42	Swedish for Work, Spoken		1			1
KE00CE75	English for Professional Communication	5				5
KE00DD58	Intercultural Competence		2			2
TLTISSE25S-1003	**Professional Core Competence**					**115**
TLTISSE25S-1033	**Basics of STEM**					**15**
AT00DD74	Basics of Algebra	3				3
AT00DD75	Geometry and Vectors	3				3
AT00DD76	Functions and Equations	3				3
AT00DF32	Derivation and Integration		3			3
AT00DD78	Statistical Mathematics		3			3
TLTISSE25S-1031	**Environmental Chemistry and Physics**					**15**
AT00DE96	Basic Chemistry	4				4
AT00DE97	Basic Physics	3				3
AT00DE98	Physics for Environmental Engineers		3			3

AT00DE73	Environmental Sampling and Monitoring		5			5
TLTISSE25S-1037 Introduction to Sustainable Solutions Engineering						**15**
AT00CH98	Climate Change and Sustainability	5				5
AT00DE62	Environmental Cycles and Sustainable Bioeconomy	5				5
AT00DE78	Technical Cycles	5				5
TLTISSE25S-1035 Process Technology and Tools						**15**
AT00DE65	Introduction to Process Engineering	5				5
AT00DE64	Introduction to Environmental Technologies	5				5
AT00DE77	CAD and 3D Modelling	5				5
TLTISSE25S-1008 Environmental Impact Management						**10**
AT00DE76	EIA and Environmental Permits		5			5
AT00DE79	Environmental Legislation and Policies		5			5
TLTISSE25S-1034 Sustainable Material Management						**15**
AT00DE75	Waste Management, Recycling and Circular Economy	5				5
AT00DE80	Material Efficiency and Sustainable Materials		5			5
AT00DE81	Sustainable Life Cycle of Product		5			5
TLTISSE25S-1018 Digital Tools for Circular Economy						**15**
AT00DD17	Principles of ICT		5			5
AT00DD18	Applied Data-analyses and Environmental Modelling		5			5
AT00DD19	System Engineering Thinking		5			5
TLTISSE25S-1009 Research and Innovation Development						**15**
AT00DE63	Product and Business Idea Design		5			5
AT00DE82	Research Methods and Reporting		5			5
AT00DE83	Laboratories for Sustainable Material Cycles		5			5
TLTISSE25S-1010 Practical Training						**30**
HA00CE82	Practical Training				10	10
HA00CE83	Practical Training 2				10	10
HA00CE84	Practical Training 3				10	10
TLTISSE25S-1011 Thesis						**15**
AO00CE85	Thesis Planning				5	5
AO00CE86	Thesis Research and Writing				5	5
AO00CE87	Thesis Publication				5	5
TLTISSE25S-1012 COMPLEMENTARY COMPETENCE						**58**
TLTISSE25S-1015 Sustainable Energy Management						**15**
AT00DF36	Energy Efficiency			5		5
AT00DF37	Renewable Energy Forms			5		5
AT00DF05	Energy Transition and New Energy Forms			5		5
TLTISSE25S-1016 Environmental, Quality and Project Management						**15**
AT00DF38	Quality Management systems, Standards and Auditing			5		5
AT00DF39	Sustainability Reporting			5		5

AT00DF04	Project Management			5		5
TLTISSE25S-1019	**Sustainable Industrial Management**					**15**
AT00DF06	Industrial Engineering			5		5
AT00DF07	Production Management			5		5
AT00DF08	Leadership & Occupational Safety			5		5
TLTISSE25S-1020	**Sustainable Water Management**					**15**
AT00DF09	Water Quality Management			5		5
AT00DF10	Wastewater Management			5		5
AT00DF11	Industrial and Urban Water Management			5		5
TLTISSE25S-1036	**Applied Circular Economy Projects**					**15**
AT00DE66	Applied CE-project 1					0
AT00DE67	Applied CE-project 2					0
AT00DE68	Applied CE-project 3					0
TLTISSE25S-1044	**Wood Technology Program Studies**					**0**
TLTISSE25S-1045	**Information Technology Program Studies**					**0**
TLTISSE25S-1046	**Sustainable Construction Technology Program Studies**					**0**
TLTISSE25S-1013	**Exchange Studies**					**0**
TLTISSE25S-1039	**Finnish as a Second Language**					**0**
K200CH62	Finnish 3		3			3
K200CH63	Finnish 4		3			3
K200CP87	Finnish Conversation 1		3			3
K200CL50	Finnish for Work 1			5		5
K200CG35	Finnish for Work 2			5		5
K200CQ88	Finnish Conversation 2			5		5
K200CR09	Finnish for Work 3				3	3
TLTISSE25S-1047	**LUT University Studies**					**0**
TLTISSE25S-1041	**Other Study Fields**					**0**

TLTISSE25S-1001 CORE COMPETENCE: 182 ECTS

TLTISSE25S-1032 Common Studies: 7 ECTS

AY00CE71 Developing Professional Competences 1: 3 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 career path 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

AY00CE72 Developing Professional Competences 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

AY00CE73 Developing Professional Competences 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 competencies during 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

TLTISSE25S-1027 Language and Communication Studies for English Students: 15 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

Prerequisites
Finnish 1 or similar skills

K200DD57 Finnish for Technology: 2 ECTS

Learning outcomes
The student is able to
- use previously learned structures and words
- use some presentation phrases
- describe some processes in their field in simple terms

Proficiency level: A1

KE00CE75 English for Professional Communication: 5 ECTS

Learning outcomes
Proficiency level: B2

The student is able to
- identify the characteristics of academic texts and to apply academic conventions to their writing
- demonstrate critical thinking and find, evaluate and use information effectively
- communicate clearly and effectively in different generic and field-specific workplace situations both orally and in writing
- function collaboratively in contemporary working environments in English.

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.

TLTISSE25S-1028 Language and Communication Studies for Finnish Students: 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).

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.

KE00CE75 English for Professional Communication: 5 ECTS

Learning outcomes
Proficiency level: B2

The student is able to
- identify the characteristics of academic texts and to apply academic conventions to their writing
- demonstrate critical thinking and find, evaluate and use information effectively
- communicate clearly and effectively in different generic and field-specific workplace situations both orally and in writing
- function collaboratively in contemporary working environments in English.

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.

TLTISSE25S-1003 Professional Core Competence: 115 ECTS

TLTISSE25S-1033 Basics of STEM: 15 ECTS

AT00DD74 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

AT00DD75 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

AT00DD76 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

AT00DF32 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

AT00DD78 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

TLTISSE25S-1031 Environmental Chemistry and Physics: 15 ECTS

AT00DE96 Basic Chemistry: 4 ECTS

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

AT00DE97 Basic Physics: 3 ECTS

Learning outcomes
The 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

AT00DE98 Physics for Environmental Engineers: 3 ECTS

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

AT00DE73 Environmental Sampling and Monitoring: 5 ECTS

Learning outcomes
The student is able to
- identify harmful environmental compounds and describe their dispersion through air, soil, and water.
- analyze the chemical properties that influence the dispersion and persistence of harmful compounds in different environments.
- provide examples of harmful compound formation, such as those produced through combustion processes.

- apply methods for monitoring and measuring environmental hazards across biological, soil, water, and air contexts.
- understand relevant legislation and regulatory methods for controlling environmental hazards and model emission dispersion to predict impact areas
- understand how, especially SDGs 3, 6, 11,12 & 13, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1037 Introduction to Sustainable Solutions Engineering: 15 ECTS

AT00CH98 Climate Change and Sustainability: 5 ECTS

Learning outcomes
The student is able to
- explain key environmental cycles and assess bioeconomy strategies for sustainability
- describe the greenhouse effect and evaluate its role and impact on climate change
- summarize the history and impacts of climate change on human and ecological systems
- assess the environmental impacts of natural resource use and propose sustainable alternatives
- understand and apply strategies for carbon capture, storage, and climate adaptation across sectors
- understand how, especially SDGs 6,7,12,13 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DE62 Environmental Cycles and Sustainable Bioeconomy: 5 ECTS

Learning outcomes
The student is able to
- explain critical environmental cycles (carbon, nutrient, water, air) and assess their roles in planetary sustainability
- evaluate the importance of biodiversity and ecosystem services in supporting life and resilience
- explain human impacts on environmental cycles
- understand climate feedback loops and how changes in one cycle affect others
- know circular bioeconomy principles and sustainability metrics to support ecological resilience and carbon sequestration
- understand how, especially SDGs 6, 12, 13,14 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DE78 Technical Cycles: 5 ECTS

Learning outcomes
The student is able to
- explain the role of technical and material cycles in supporting a circular economy
- evaluate responsible production and consumption practices for resources
- assess the impacts of sustainable and non-sustainable production on issues like pollution, climate change, and resource and nature depletion
- apply principles of circular economy to product and process design, with examples of circular models
- identify key policies and regulations that drive circular business development in various industries
- understand how, especially SDGs 9,12,13 & 15, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1035 Process Technology and Tools: 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

AT00DE64 Introduction to Environmental Technologies: 5 ECTS

Learning outcomes
The student is able to
- identify and describe common treatment methods for environmental emissions in and into water, waste, and air across various industries
- explain the concept of side streams and assess their role in resource efficiency within industrial processes
- summarize Best Available Techniques (BAT) and recognize their application in environmental management
- provide examples of companies implementing environmental solutions and industrial symbiosis in water, energy, and material flows
- evaluate emerging technologies in environmental engineering
- understand how, especially SDGs 6, 7, 9, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DE77 CAD and 3D Modelling: 5 ECTS

Learning outcomes
The student is able to
- use CAD software to create basic technical drawings and models
- interpret and modify CAD files to meet specific design requirements
- create 3D models for product design, visualization, and analysis
- apply general 3D modelling techniques for prototyping and simulation purposes
- understand file formats, export models, and integrate with other design software
- understand how, especially SDGs 4,9 & 12, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1008 Environmental Impact Management: 10 ECTS

AT00DE76 EIA and Environmental Permits: 5 ECTS

Learning outcomes
The student is able to
- explain the Environmental Impact Assessment (EIA) process
- identify relevant legislation and guidelines that govern Environmental Impact Assessments
- explain the Environmental Permitting process
- identify relevant legislation and guidelines that govern Environmental Permitting process
- understand how, especially SDGs 6, 11, 12, 13 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DE79 Environmental Legislation and Policies: 5 ECTS

Learning outcomes
The student is able to
- describe the structure of EU environmental legislation and its impact on member states' regulations
- analyse the key principles of Finnish environmental legislation and its integration with EU regulations
- evaluate case examples of environmental legislation and apply knowledge to real-world compliance scenarios
- identify and explain key international environmental agreements and strategies
- understand how, especially SDGs 12, 13, 15 & 16, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1034 Sustainable Material Management: 15 ECTS

AT00DE75 Waste Management, Recycling and Circular Economy: 5 ECTS

Learning outcomes
The student is able to
- understand the basic principles and policies of waste management
- identify technologies that support the circular economy, especially in the field of waste and side stream management
- apply concepts of recycling and upcycling within the framework of industrial symbiosis
- implement design for disassembly and reuse techniques to facilitate recycling, refurbishment, and repurposing of products
- understand how, especially SDGs 9,11, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DE80 Material Efficiency and Sustainable Materials: 5 ECTS

Learning outcomes
The student is able to
- apply material flow cost accounting (MFCA) and principles of material efficiency auditing
- identify and evaluate the properties and applications of bio-materials and other common industrial materials
- develop strategies for managing critical raw materials that have high environmental impacts or scarcity concerns

- assess the role of biodegradable and compostable materials within the circular economy
- study material substitutions and sustainable alternatives to reduce reliance on toxic, critical and non-renewable resources
- understand how, especially SDGs 8, 9, 12, 13 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DE81 Sustainable Life Cycle of Product: 5 ECTS

Learning outcomes
The student is able to
- perform Life Cycle Assessment (LCA) calculations to evaluate the environmental impact of products
- understand and apply the basic principles of various LCA calculation tools
- use ISO 14040 standards to guide and structure LCA processes
- calculate and interpret carbon and material footprints as part of sustainability assessments
- present and analyse LCA results
- understand how, especially SDGs 9, 12, 13 & 15, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1018 Digital Tools for Circular Economy: 15 ECTS

AT00DD17 Principles of ICT: 5 ECTS

Learning outcomes
The student is able to
- apply systems engineering thinking and the Team of Teams model to collaborative learning
- integrate sensor, measurement, and IoT technologies to solve practical challenges, including the exploration of case studies such as drones
- engage in a structured weekly workflow with regular meetings, briefings, and hands-on activities to enhance learning and project development
- follow defined learning paths to develop competencies in workflow management, functional abstraction, and system architecture
- design, conduct, and report experiments through levels of experiment design, contributing to project goals and personal certification progress
- understand how, especially SDGs 4, 9, 11 & 12, are linked to the course´s themes to promote more sustainable solutions

AT00DD18 Applied Data-analyses and Environmental Modelling: 5 ECTS

Learning outcomes
The student is able to
- understand the basics of geospatial information and data literacy, including foundational statistical concepts using R
- identify and access available data sources for geospatial analysis and apply essential GIS skills for spatial data interpretation
- apply satellite positioning techniques to enhance geospatial analysis and data accuracy
- evaluate the role of blockchain in supply chain transparency and explain how digital product passports can detail product composition and environmental impact

- utilize artificial intelligence in predictive analytics to optimize resource use, waste management, and energy efficiency
- understand how, especially SDGs 4, 9, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DD19 System Engineering Thinking: 5 ECTS

Learning outcomes
The student is able to
- demonstrate fundamental programming skills, particularly in Python, and apply them to basic microcontroller tasks (e.g., Raspi Pico)
- understand essential mathematical concepts in ICT, including coordinate systems, mapping, and probability as it relates to AI
- explain the basics of artificial intelligence and its applications in ICT
- manage files, databases, and understand the basics of connectivity and network systems
- apply cybersecurity principles and experiment with emerging technologies such as quantum computing and 3D printing
- understand how, especially SDGs 4. 9 & 12, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1009 Research and Innovation Development: 15 ECTS

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

AT00DE82 Research Methods and Reporting: 5 ECTS

Learning outcomes
The student is able to
- understand and navigate the thesis process, including planning, structuring, and completing a research project
- identify and apply the most common research methods appropriate to Sustainable Solutions engineering in LAB
- design and conduct quantitative research, including data collection, analysis, and interpretation

- critically evaluate research findings and present them in a clear and organized manner
- demonstrate effective academic writing and reporting skills throughout
- understand how, especially SDGs 4, 9 & 12, are linked to the course´s themes to promote more sustainable solutions

AT00DE83 Laboratories for Sustainable Material Cycles: 5 ECTS

Learning outcomes
The student is able to
- apply various separation methods in the analysis of products, materials and sidestreams
- perform product testing and analysis to evaluate quality and composition
- identify and utilize renewable materials and side streams within the circular economy framework
- calculate and assess the energy content of materials and products
- know LAB´s Circular Economy Laboratory, it´s equipments and environments for practical applications
- understand how, especially SDGs 7, 9, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1010 Practical Training: 30 ECTS

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

HA00CE83 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

HA00CE84 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

TLTISSE25S-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.

TLTISSE25S-1012 COMPLEMENTARY COMPETENCE: 58 ECTS

TLTISSE25S-1015 Sustainable Energy Management: 15 ECTS

AT00DF36 Energy Efficiency: 5 ECTS

Learning outcomes
The student is able to
- explain the production of renewable energy sources and outline goals for their increased use
- differentiate between centralized and decentralized energy production systems and assess their applications
- evaluate the environmental impacts of various energy production methods

- analyze the cost implications of different energy production methods
- use tools to assess the suitability of renewable energy sources for different applications
- understand how, especially SDGs SDGs 7, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DF37 Renewable Energy Forms: 5 ECTS

Learning outcomes
The student is able to
- describe the different stages of energy production and identify opportunities for efficiency improvements
- evaluate and apply methods for enhancing energy efficiency across various production methods, considering local and global impacts
- understand security considerations in energy distribution and address risks associated with energy systems
- use digital tools, including Sankey diagrams, to analyze, monitor, and optimize energy flows and efficiency
- conduct laboratory experiments on energy efficiency and evaluate energy-efficient transportation methods within sustainable systems
- understand how, especially SDGs 7, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

AT00DF05 Energy Transition and New Energy Forms: 5 ECTS

Learning outcomes
The student is able to
- describe the basics of emerging renewable energy forms
- evaluate various energy storage solutions
- understand and explain the role of decentralized energy systems
- assess economic instruments for promoting clean energy, such as carbon pricing, and renewable energy certificates
- analyze the components and functionality of smart electricity grids
- understand how, especially SDGs 7, 9,11, 12 & 13, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1016 Environmental, Quality and Project Management: 15 ECTS

AT00DF38 Quality Management systems, Standards and Auditing: 5 ECTS

Learning outcomes
The student is able to
- understand and explain key standard frameworks
- identify and interpret the requirements of quality management systems
- understand the requirements of relevant standards
- plan, conduct, and report audits
- understand how, especially SDGs 9, 12, 13 & 16, are linked to the course´s themes to promote more sustainable solutions

AT00DF39 Sustainability Reporting: 5 ECTS

Learning outcomes
The student is able to
- understand the fundamentals of Corporate Sustainability Reporting and the CSRD Directive
- apply the GRI standard for verifying sustainability reports and assess report accuracy
- explain the basics of the EU taxonomy, its reporting system, and its connection to sustainability reporting requirements
- analyse a company's CSR report and participate in a round table discussion to evaluate and discuss sustainability practices
- understand how, especially SDGs 8,9,12 & 16, are linked to the course´s themes to promote more sustainable solutions

AT00DF04 Project Management: 5 ECTS

Learning outcomes
The student is able to
- understand the role and importance of project management in achieving project goals
- create a basic project plan, outlining objectives, tasks, timelines, and resources
- implement and utilize essential project management tools to organize and track project progress
- demonstrate effective communication, teamwork, and digital skills within a project context
- identify and differentiate between various types of Sustainable Systems Engineering (SSE) projects
- understand how, especially SDGs 4. 8, 9 & 12, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1019 Sustainable Industrial Management: 15 ECTS

AT00DF06 Industrial Engineering: 5 ECTS

Learning outcomes
The student is able to
- explain the principles of industrial processes and apply fundamental concepts of industrial design in real-world contexts
- understand and implement basic automation techniques, recognizing their role in improving efficiency and productivity
- assess sustainability aspects within Industry 4.0, identifying how technologies and policies drive sustainable industrial practices
- incorporate safety considerations, lifecycle management, and resource efficiency (materials, by-products, energy) in industrial processes
- apply Lean and Six Sigma principles to reduce waste and enhance quality
- understanding the benefits of industrial symbiosis in sharing resources and reducing environmental impact
- understand how, especially SDGs 7,8, 9,12 and 13, are linked to the course´s themes to promote more sustainable solutions

AT00DF07 Production Management: 5 ECTS

Learning outcomes
The student is able to
- understand the importance of the production planning
- know the principles of industrial management to optimize production efficiency and process flow
- understand the logistics operations
- evaluate production costs and identify areas for cost optimization
- implement sustainability methods within the supply chain, ensuring environmentally and socially responsible practices across all stages
- understand how, especially SDGs 8, 9,12 and 13, are linked to the course´s themes to promote more sustainable solutions

AT00DF08 Leadership & Occupational Safety: 5 ECTS

Learning outcomes
The student is able to
- understand the role of the effective leadership skills to promote safety, well-being, and productivity within teams
- understand occupational safety principles to create a safe and compliant work environment
- identify and interpret relevant legislation
- develop self-leadership skills to manage responsibilities, set personal goals, and maintain professional growth
- apply subordinate skills, including effective communication and teamwork, to contribute positively to organizational culture and safety practice
- understand how, especially SDGs 3, 8, 10 and 16, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1020 Sustainable Water Management: 15 ECTS

AT00DF09 Water Quality Management: 5 ECTS

Learning outcomes
The student is able to
- explain the structure and functions of aquatic ecosystems and assess their impacts on water supply
- analyse the hydrological cycle, including human impacts on water resources and flow patterns
- identify sources of potable water and evaluate methods for water treatment and purification
- understand and apply international laws, agreements, and water footprint assessment methods to manage water usage sustainably
- implement risk management principles and circular economy concepts for water, leveraging knowledge of water management institutions, frameworks, and emerging technologies
- understand how, especially SDGs 6, 12, 12, 14 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DF10 Wastewater Management: 5 ECTS

Learning outcomes
The student is able to
- explain wastewater treatment methods and processes
- assess factors affecting wastewater treatment process

- describe sludge treatment methods and evaluate their role in wastewater management
- understand the dimensioning principles of wastewater treatment systems
- conduct laboratory experiments to analyse treatment processes, interpret results, and improve understanding of wastewater management techniques
- understand how, especially SDGs 6,12, 14 & 15, are linked to the course´s themes to promote more sustainable solutions

AT00DF11 Industrial and Urban Water Management: 5 ECTS

Learning outcomes
The student is able to
- perform calculations of water flows and water balance to support effective water management
- understand process water treatment methods to improve water quality in industrial systems
- assess stormwater management strategies, including the impacts of climate change on stormwater systems
- apply dimensioning calculations to design or evaluate water treatment and stormwater management solutions
- analyse the water-energy nexus, exploring how water and energy consumption are interdependent, and evaluate green infrastructure solutions like bioswales, rain gardens, and permeable pavements to manage stormwater sustainably
- understand how, especially SDGs 6,7,11,12 & 13, are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1036 Applied Circular Economy Projects: 15 ECTS

AT00DE66 Applied CE-project 1: 5 ECTS

Learning outcomes
The student is able to
- analyse and draw insights from case studies of successful circular economy initiatives
- participate in collaborative projects with industry or other stakeholders, gaining practical experience in applying circular economy principles
- develop creative solutions to circular economy problems
- demonstrate effective project management, reporting, and teamwork skills
- evaluate and communicate the outcomes of circular economy projects, providing recommendations for future improvement based on collaborative and hands-on experiences
- understand what and how, especially SDGs 8, 9, 11, 12 & 17 are linked to the course´s themes to promote more sustainable solutions

AT00DE67 Applied CE-project 2: 5 ECTS

Learning outcomes
The student is able to
- analyse and draw insights from case studies of successful circular economy initiatives
- participate in collaborative projects with industry or other stakeholders, gaining practical experience in applying circular economy principles
- develop creative solutions to circular economy problems
- demonstrate effective project management, reporting, and teamwork skills

- evaluate and communicate the outcomes of circular economy projects, providing recommendations for future improvement based on collaborative and hands-on experiences
- understand what and how, especially SDGs 8, 9, 11, 12 & 17 are linked to the course´s themes to promote more sustainable solutions

AT00DE68 Applied CE-project 3: 5 ECTS

Learning outcomes
The student is able to
- analyse and draw insights from case studies of successful circular economy initiatives
- participate in collaborative projects with industry or other stakeholders, gaining practical experience in applying circular economy principles
- develop creative solutions to circular economy problems
- demonstrate effective project management, reporting, and teamwork skills
- evaluate and communicate the outcomes of circular economy projects, providing recommendations for future improvement based on collaborative and hands-on experiences
- understand what and how, especially SDGs 8, 9, 11, 12 & 17 are linked to the course´s themes to promote more sustainable solutions

TLTISSE25S-1044 Wood Technology Program Studies: 0 ECTS

TLTISSE25S-1045 Information Technology Program Studies: 0 ECTS

TLTISSE25S-1046 Sustainable Construction Technology Program Studies: 0 ECTS

TLTISSE25S-1013 Exchange Studies: 0 ECTS

TLTISSE25S-1039 Finnish as a Second Language: 0 ECTS

K200CH62 Finnish 3: 3 ECTS

Learning outcomes
The student is able to
- tell about their own housing and neigbourhood.
- understand and write simple messages and announcements related to housing.
- understand and speak words and expressions related to weather.
- ask questions in simple shopping and other situations (e.g., clothing and furniture stores and bus and railway stations).
- read short advertisements, announcements and other texts related to travelling (e.g., timetables).

Proficiency level: A1

K200CH63 Finnish 4: 3 ECTS

Learning outcomes

The student is able to
- ask about the health and describe their own health.
- describe places, things and people.
- understand and write short messages about everyday life (e.g., invitations, requests, messages of absence).
- understand short messages and advertiments related to celebrations and events.
- tell about matters and events using the most common verbs in the past tense.

Proficiency level: A1

Prerequisites
Courses Finnish 1 - 3 or equivalent skills

K200CP87 Finnish Conversation 1: 3 ECTS

Learning outcomes
The student is able to
- tell about themselves, close relations and everyday life
- act in the most common authentic spoken situations in Finnish
- start and finish a brief dialogue
- use basic vocabulary and common grammatical structures in speech
- understand simple speech on concrete topics.

Proficiency level: A1

K200CL50 Finnish for Work 1: 5 ECTS

Learning outcomes
Proficiency level A2

The student
- is familiar with the main stages of the job search process in Finland
- is able to tell about his/her skills
- understands short texts related to job search
- is able to communicate in situations related to job search.

K200CG35 Finnish for Work 2: 5 ECTS

Learning outcomes
Proficiency level A2
Student
- knows the main features of the Finnish working culture
- understands simple texts and instructions related to induction, workplace rules and safety at work
- can describe the working environment
- can communicate in informal situations in the workplace

K200CQ88 Finnish Conversation 2: 5 ECTS

Learning outcomes
The student is able to
- tell about themselves, their interests, and express opinions on various topics
- act in more versatile authentic spoken situations in Finnish
- follow conversations, start them, and take part in maintaining them
- understand and use various vocabulary and grammatical structures in speech.

Proficiency level A2

Prerequisites
Finnish for Work 2 or corresponding skills
CEFR level: A2+

K200CR09 Finnish for Work 3: 3 ECTS

Learning outcomes
Proficiency level B1

The students will be able to
- communicate in informal and formal discussions at work.
- communicate in customer service and complaint situations.
- compose work-related e-mail messages.

TLTISSE25S-1047 LUT University Studies: 0 ECTS

TLTISSE25S-1041 Other Study Fields: 0 ECTS