

Curriculum at Lahti University of Applied Sciences  
2017-2018

## Bachelor's Degree Programme in Energy and Environmental Engineering 17

| Code                                                     | Name                                       | 1 y | 2 y | 3 y | 4 y | ECTS total |
|----------------------------------------------------------|--------------------------------------------|-----|-----|-----|-----|------------|
| <b>TEEYT17-1000 CORE COMPETENCE</b>                      |                                            |     |     |     |     | <b>180</b> |
| <b>TEEYT17-1001 Common Core Competence</b>               |                                            |     |     |     |     | <b>25</b>  |
| LA00BE73                                                 | English for Work                           | 3   |     |     |     | 3          |
| LA00BE74                                                 | Swedish language, Oral Communication       |     |     | 1   |     | 1          |
| LA00BE75                                                 | Swedish language, Written Communication    |     |     | 2   |     | 2          |
| LA00BE76                                                 | Professional communication                 | 4   |     |     |     | 4          |
| LA00BE77                                                 | Developing professional competence 1       | 2   |     |     |     | 2          |
| LA00BQ87                                                 | Developing professional competence 2       |     | 2   |     |     | 2          |
| LA00BQ88                                                 | Developing professional competence 3       |     |     | 1   |     | 1          |
| LA00BE78                                                 | Research and Development                   |     | 5   |     |     | 5          |
| LA00BE79                                                 | Anticipating Future Trends                 |     |     | 5   |     | 5          |
| <b>TEEYT17-1002 Professional Core Competence</b>         |                                            |     |     |     |     | <b>155</b> |
| <b>TEEYT17-1018 Digitalisation</b>                       |                                            |     |     |     |     | <b>10</b>  |
| TE00BH08                                                 | Digitalisation of the Future               | 3   |     |     |     | 3          |
| TE00BH09                                                 | Networks, Data Security and Cloud Services | 3   |     |     |     | 3          |
| TE00BH10                                                 | Digital Tools                              | 4   |     |     |     | 4          |
| <b>TEEYT17-1019 Mechanics</b>                            |                                            |     |     |     |     | <b>10</b>  |
| TE00BH11                                                 | Mathematical tools                         | 5   |     |     |     | 5          |
| TE00BH12                                                 | Mechanical Applications                    | 5   |     |     |     | 5          |
| <b>TEEYT17-1020 Electricity, Heat and Energy</b>         |                                            |     |     |     |     | <b>15</b>  |
| TE00BH13                                                 | Electricity                                |     | 6   |     |     | 6          |
| TE00BH14                                                 | Heat and Energy                            |     | 6   |     |     | 6          |
| TE00BH15                                                 | English for Engineers                      |     | 3   |     |     | 3          |
| <b>TEEYT17-1007 Energy and Environmental Engineering</b> |                                            |     |     |     |     | <b>15</b>  |
| TE00BF85                                                 | Ecosystems and Environmental Protection    | 3   |     |     |     | 3          |
| TE00BF86                                                 | Environmental Chemistry and Safety         | 6   |     |     |     | 6          |
| TE00BF87                                                 | Water, Waste and Energy Technology         | 6   |     |     |     | 6          |
| <b>TEEYT17-1008 Community, Environment and Man</b>       |                                            |     |     |     |     | <b>15</b>  |
| TE00BF88                                                 | Use of Environmental Data and Inventories  | 5   |     |     |     | 5          |
| TE00BF89                                                 | Planning System and Interaction            | 4   |     |     |     | 4          |
| TE00BG83                                                 | Computer-aided Design                      | 3   |     |     |     | 3          |

|                                                                                       |                                                        |           |   |     |     |    |
|---------------------------------------------------------------------------------------|--------------------------------------------------------|-----------|---|-----|-----|----|
| TE00BG84                                                                              | Environmental Project                                  | 3         |   |     |     | 3  |
| <b>TEEYT17-1010 Planning of Environmental Technology and Community Infrastructure</b> |                                                        | <b>15</b> |   |     |     |    |
| TE00BF91                                                                              | Environmental Technology and Community Infrastructures |           | 5 |     |     | 5  |
| TE00BF90                                                                              | Environmental Impact Assessment                        |           | 4 |     |     | 4  |
| TE00BF92                                                                              | Basics of Geographic Data                              | 3         |   |     |     | 3  |
| TE00BG98                                                                              | Environmental Legislation and Administration           |           | 3 |     |     | 3  |
| <b>TEEYT17-1012 Material and Environmental Efficiency</b>                             |                                                        | <b>0</b>  |   |     |     |    |
| TE00BF98                                                                              | Recycling and Waste Management Solutions               |           | 4 |     |     | 4  |
| TE00BF99                                                                              | Analysing and Remediating of Polluted Soil             |           | 4 |     |     | 4  |
| TE00BG00                                                                              | Water Management                                       |           | 4 |     |     | 4  |
| TE00BG01                                                                              | Life Cycle Methods                                     |           | 3 |     |     | 3  |
| <b>TEEYT17-1011 Energy Efficiency and Renewable Energy</b>                            |                                                        | <b>0</b>  |   |     |     |    |
| TE00BF95                                                                              | Energy Efficiency                                      |           | 5 |     |     | 5  |
| TE00BF96                                                                              | Renewable Energy Forms                                 |           | 5 |     |     | 5  |
| TE00BF97                                                                              | Energy Project                                         |           | 5 |     |     | 5  |
| <b>TEEYT17-1013 Community and Residential Surroundings</b>                            |                                                        | <b>0</b>  |   |     |     |    |
| TE00BG02                                                                              | Starting Points for Planning Residential Surroundings  |           | 5 |     |     | 5  |
| TE00BG03                                                                              | Town Planning Process and Documents                    |           | 5 |     |     | 5  |
| TE00BG04                                                                              | Efficient Infrastructure and Energy Efficiency         |           | 5 |     |     | 5  |
| <b>TEEYT17-1014 Community Development Project</b>                                     |                                                        | <b>0</b>  |   |     |     |    |
| TE00BG05                                                                              | Municipality as an Operating Environment               |           |   | 5   |     | 5  |
| TE00BG06                                                                              | Development Project                                    |           |   | 10  |     | 10 |
| <b>TEEYT17-1021 Industrial Engineering and Management</b>                             |                                                        | <b>0</b>  |   |     |     |    |
| TE00BG67                                                                              | Business and Marketing                                 |           |   | 5   |     | 5  |
| TE00BG68                                                                              | Management and Quality                                 |           |   | 5   |     | 5  |
| TE00BG69                                                                              | Operations Control                                     |           |   | 5   |     | 5  |
| <b>TEEYT17-1003 Practical Training</b>                                                |                                                        | <b>30</b> |   |     |     |    |
| LA00BO03                                                                              | Practical Training                                     | 1,5       | 3 | 3   | 3   | 10 |
| LA00BO04                                                                              | Practical Training 2                                   | 1,5       | 3 | 3   | 3   | 10 |
| LA00BO05                                                                              | Practical Training 3                                   | 1,5       | 3 | 3   | 3   | 10 |
| <b>TEEYT17-1004 Thesis</b>                                                            |                                                        | <b>15</b> |   |     |     |    |
| LA00BN99                                                                              | Thesis planning                                        |           |   | 2,5 | 2,5 | 5  |
| LA00BO00                                                                              | Thesis research and writing                            |           |   | 2,5 | 2,5 | 5  |
| LA00BO01                                                                              | Thesis publication                                     |           |   | 2,5 | 2,5 | 5  |
| <b>TEEYT17-1005 COMPLEMENTARY COMPETENCE</b>                                          |                                                        | <b>60</b> |   |     |     |    |

**TEEYT17-1000 CORE COMPETENCE: 180 ECTS**

**TEEYT17-1001 Common Core Competence: 25 ECTS**

## **LA00BE73 English for Work: 3 ECTS**

### **Learning outcomes**

The student is able to

- recognise the different sources and tools to help them improve their English skills
- gain confidence and manage in written and oral communication situations required in professional studies and in the work life
- describe their education and qualifications
- understand the terminology and concepts of their own field

## **LA00BE74 Swedish language, Oral Communication: 1 ECTS**

### **Learning outcomes**

The student is able to

- express and justify their opinions
- use the key terminology of their own field
- tell about their education, work experience and duties e.g. in job-seeking situations
- present a company of their own trade

## **LA00BE75 Swedish language, Written Communication: 2 ECTS**

### **Learning outcomes**

The student is able to

- use the key terminology of their own field
- tell about their education, work experience and duties e.g. in job-seeking situations
- write a job application
- obtain information related to their own field of studies in Swedish e.g. on the Internet
- use online dictionaries

## **LA00BE76 Professional communication: 4 ECTS**

### **Learning outcomes**

The student is able to

- plan and produce grammatically correct texts
- write an article or an essay that fulfils the criteria of a scientific text related to their own field of studies
- perform actively in professional group communication situations
- retrieve information from a variety of sources and evaluate it critically

## **LA00BE77 Developing professional competence 1: 2 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 Lahti UAS
- picture their own field of studies and its future skills
- give feedback on tuition and services and thus participate in the development of education

## **LA00BQ87 Developing professional competence 2: 2 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

## **LA00BQ88 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 competencies during job recruitment processes
- give feedback on tuition and services and thus participate in the development of education

## **LA00BE78 Research and Development: 5 ECTS**

### **Learning outcomes**

The student is able to

- obtain, utilise and assess R&D-related information and their sources critically
- follow the rules of ethical principles applied in all research activities
- use the most typical research and development methods of their own field
- write a scientific report and is familiar with the requirements for language and style and how to document the sources

## **LA00BE79 Anticipating Future Trends: 5 ECTS**

### **Learning outcomes**

The student is able to

- anticipate the changes in their own operational environment
- utilise the futures research materials produced by national and international societies in their own field of studies
- use the terminology and methods of futures research in the research and development of their own field

## **TEEYT17-1002 Professional Core Competence: 155 ECTS**

## **TEEYT17-1018 Digitalisation: 10 ECTS**

### **TE00BH08 Digitalisation of the Future: 3 ECTS**

#### **Learning outcomes**

The student is able to

- describe the significance of digitalisation in the work life and its changes
- utilise digital data storages and social media in professional contexts
- utilise the field's new technologies, such as IoT, big data, GIS, robotics and AI

### **TE00BH09 Networks, Data Security and Cloud Services: 3 ECTS**

#### **Learning outcomes**

The student is able to

- operate in digital environments in a responsible way, taking data security into account
- describe the basic structure and operation of the Internet
- describe the principles of IP addresses and sub-networking
- implement a secure data network (SOHO) and connect it to an operator network
- utilise cloud services in their own work

### **TE00BH10 Digital Tools: 4 ECTS**

#### **Learning outcomes**

The student is able to

- make reports and analyses with the help of wordprocessing and spreadsheet calculation software
- make a presentation of a practical project where they utilise elements of digital media
- carry out electronic publishing

## **TEEYT17-1019 Mechanics: 10 ECTS**

### **TE00BH11 Mathematical tools: 5 ECTS**

#### **Learning outcomes**

The student

- has the basic mathematical skills needed in engineering
- is able to describe the mechanical phenomena behind the developments in technology
- can solve mechanical problems using mathematics

### **TE00BH12 Mechanical Applications: 5 ECTS**

#### **Learning outcomes**

The student is able to

- apply mechanics in practice
- apply digitalisation in mechanical phenomena
- apply vector mathematics in mechanical phenomena

## **TEEYT17-1020 Electricity, Heat and Energy: 15 ECTS**

### **TE00BH13 Electricity: 6 ECTS**

#### **Learning outcomes**

The student is able to

- describe the electrical phenomena behind developments in technology
- solve electricity-related problems using mathematics
- apply electrical phenomena in practice
- apply digitalisation in electricity-related phenomena

### **TE00BH14 Heat and Energy: 6 ECTS**

#### **Learning outcomes**

The student is able to

- describe the significance of heat behind the development of technology
- solve heat- and energy-related problems using mathematics
- apply heat phenomena in practice

### **TE00BH15 English for Engineers: 3 ECTS**

#### **Learning outcomes**

The students is able to

- use the terminology of their field and understand professional texts
- discuss topics related with their field
- communicate in job application situations
- present their own project orally and in writing
- write a professional report and a thesis abstract

## **TEEYT17-1007 Energy and Environmental Engineering: 15 ECTS**

### **TE00BF85 Ecosystems and Environmental Protection: 3 ECTS**

#### **Learning outcomes**

The student can

- describe the principles of how ecosystems work and what factors influence them
- analyse different ecosystem services and evaluate their significance
- describe how people's actions affect the environment (including climate change) and knows methods to prevent them
- the concept of urban ecology and how it is related with natural ecosystems

### **TE00BF86 Environmental Chemistry and Safety: 6 ECTS**

#### **Learning outcomes**

The student is able to

- identify the most common environmentally harmful substances and how they behave in the

environment

- use the central legislation dealing with environmentally harmful substances
- name and identify inorganic and organic compounds
- know health impacts caused by harmful substances
- carry out laboratory tasks connected with environmental chemistry

### **TE00BF87 Water, Waste and Energy Technology: 6 ECTS**

#### **Learning outcomes**

The student is able to

- describe the general operation of Finland's waste, energy and water management
- tell why it is important to reduce the amount of waste and how it can be influenced
- tell what kind of challenges and opportunities there are related with urban and rural water management
- tell what kind of challenges and opportunities there are in the energy field in Finland and globally
- search for information on the topic and apply the information

### **TEEYT17-1008 Community, Environment and Man: 15 ECTS**

### **TE00BF88 Use of Environmental Data and Inventories: 5 ECTS**

#### **Learning outcomes**

The student is able to

- understand the starting points of nature and the built environment for environmental and community planning
- acquire information on nature, the landscape, the built environment and the cultural environment and to analyse it so it can be used in community planning
- acquire and analyse geographic information to be used in community planning

### **TE00BF89 Planning System and Interaction: 4 ECTS**

#### **Learning outcomes**

The student is able to

- acquire information on plans and surveys for a given area and to make summaries from them
- identify the starting points and task of land use planning
- know the role of community planning in society and in overcoming new challenges
- identify the importance of interaction

### **TE00BG83 Computer-aided Design: 3 ECTS**

#### **Learning outcomes**

The student is able to

- identify the possibilities offered by computer-aided design
- the basic of CAD
- make simple drawings with the software utilising the basic functions of the program

## **TE00BG84 Environmental Project: 3 ECTS**

### **Learning outcomes**

The student is able to

- apply the operating principles of project management and to work as a responsible member of a project team in an environmental development project
- use different methods to acquire and process information
- select the development methods and actions that best suit the assignment
- report on the project results and present them according to the instructions

## **TEEYT17-1010 Planning of Environmental Technology and Community Infrastructure: 15 ECTS**

## **TE00BF91 Environmental Technology and Community Infrastructures: 5 ECTS**

### **Learning outcomes**

The student is able to

- understand principles of community infrastructure systems
- collect and analyse information on environmental and community infrastructure, make a survey from it and use the survey as a starting point for a development plan

## **TE00BF90 Environmental Impact Assessment: 4 ECTS**

### **Learning outcomes**

The student is able to

- know the regulations and objectives of environmental impact assessment
- describe the process of project-level environmental impact assessment, as well as commonly used assessment methods
- describe participation procedures in the process and what factors contribute to successful participation
- analyse environmental impact assessment projects and report on them.

## **TE00BF92 Basics of Geographic Data: 3 ECTS**

### **Learning outcomes**

The student is able to

- know where geographic data is applied
- use the QGIS software (or equivalent)
- utilise the software in environmental inventory and planning tasks

## **TE00BG98 Environmental Legislation and Administration: 3 ECTS**

### **Learning outcomes**

The student is able to

- know the central contents of environmental legislation
- search for information on legislation and how it is applied in different situations
- the operating principles of the Finnish environmental administration

## **TEEYT17-1012 Material and Environmental Efficiency: 15 ECTS**

### **TE00BF98 Recycling and Waste Management Solutions: 4 ECTS**

#### **Learning outcomes**

The student is able to

- know the main processes and operators in waste management and recycling
- know the methods of norm and information steering in the field, as well as the significance of economic factors
- develop source separation in bigger units, organisations and industry
- know the main processes and treatment techniques of materials in the recycling industry
- understand the requirements of using waste as a source of energy and landfilling

### **TE00BF99 Analysing and Remediating of Polluted Soil: 4 ECTS**

#### **Learning outcomes**

The student can

- the main regulations concerning polluted soils
- the stages of a remediation process and the main principles of assessing the need for remediation
- identify the main sources polluting the soil and groundwater
- the main soil remediation techniques
- make a plan for taking samples, take samples and deliver them to a laboratory for testing

### **TE00BG00 Water Management: 4 ECTS**

#### **Learning outcomes**

The student is able to

- use the professional terms of water management consistently
- select the most suitable methods for the management of water and waste water in rural and urban areas
- apply the planning methods and risk assessment techniques connected with the water management chain

### **TE00BG01 Life Cycle Methods: 3 ECTS**

#### **Learning outcomes**

The student is able to

- describe the stages of the life cycle of products and develop the resource and environmental factors related to them
- commonly used life cycle methods and their applications
- practices related material and carbon footprint calculation

## **TEEYT17-1011 Energy Efficiency and Renewable Energy: 15 ECTS**

### **TE00BF95 Energy Efficiency: 5 ECTS**

**Learning outcomes**

The student

- is able to identify the main aspects of the different stages of the energy chain (acquisition, production and consumption)
- knows different methods and technologies to promote energy efficiency and security of supply, and knows their significance at the local and global level
- is able to describe the role of digitalisation as part of energy efficient solutions now and in the future
- is able to utilise different tools when assessing and comparing energy efficiency and more sustainable energy forms, for example in energy consulting

**TE00BF96 Renewable Energy Forms: 5 ECTS****Learning outcomes**

The student

- is able to describe how different forms of renewable energy are generated and the targets set for their increased use
- knows the main concepts connected with decentralized energy production and the related targets
- is able to compare the environmental and cost impacts of different forms of energy and to evaluate their suitability for different uses

**TE00BF97 Energy Project: 5 ECTS****Learning outcomes**

The student

- knows how to search for and apply information required to carry out energy-related projects
- is able to choose the most suitable methods to perform different energy-related assignments
- is able to act as a responsible member of a team, and to present and report on a project according to the reporting guidelines of Lahti UAS

**TEEYT17-1013 Community and Residential Surroundings: 15 ECTS****TE00BG02 Starting Points for Planning Residential Surroundings: 5 ECTS****Learning outcomes**

The student is able to

- search for information and analyse it to be used as the basis of planning and is able to justify the significance for the planning process of studying the starting points of the environment
- investigate the starting points of the environment, to be used in the planning process
- understand the principles of planning residential surroundings
- produce material to visualize a plan and/or make a survey of the surroundings and targets for planning

**TE00BG03 Town Planning Process and Documents: 5 ECTS****Learning outcomes**

The student is able to

- describe the stages of the town planning process, as well as the contents of planning documents
- understand how the town plan affects the formation of the built environment and the preservation of the environment
- produce preliminary drafts of town planning documents for a target area
- understand the significance of computer-aided planning in the production of plans and is able to use computers in making town plans

### **TE00BG04 Efficient Infrastructure and Energy Efficiency: 5 ECTS**

#### **Learning outcomes**

The student is able to

- understand the principles of traffic and road planning
- understand how town planning is connected with traffic and road planning
- design traffic routes and make a computer-based plan
- understand the basics of the energy efficiency of buildings

### **TEEYT17-1014 Community Development Project: 15 ECTS**

### **TE00BG05 Municipality as an Operating Environment: 5 ECTS**

#### **Learning outcomes**

The student is able to

- acquire information on the reform of provincial administration and understands how it affects municipalities
- understand the operating environment of municipalities and decision making in municipalities
- understand the starting points of master planning and is able to produce and analyse information about master plans and for master plans
- make development plans based on the needs of a municipality

### **TE00BG06 Development Project: 10 ECTS**

#### **Learning outcomes**

The student is able to

- utilise planning software in order to visualise information they have analysed or produced
- acquire information and make a survey for the basis of a development project, and is able to utilise geographical data
- investigate the target area of the project taking into account the starting points of the environment
- make development suggestions in the project, based on the surveys and acquired information

### **TEEYT17-1021 Industrial Engineering and Management: 15 ECTS**

### **TE00BG67 Business and Marketing: 5 ECTS**

#### **Learning outcomes**

The student

- is able to define and understand the customer's needs
- is able to apply and execute different kinds of marketing methods

- knows the basics of the money transactions of a company and their significance in business

### **TE00BG68 Management and Quality: 5 ECTS**

#### **Learning outcomes**

The student

- is able to evaluate different management methods and what their importance is for the whole company
- knows the basic concepts of labour legislation
- is able to evaluate factors influencing job satisfaction and motivation

### **TE00BG69 Operations Control: 5 ECTS**

#### **Learning outcomes**

The student is able to

- analyse and develop internal logistics
- analyse and develop the components of the supply chain

### **TEEYT17-1003 Practical Training: 30 ECTS**

### **LA00BO03 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 into the work done in practical training

### **LA00BO04 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 into the work done in practical training

### **LA00BO05 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 into the work done in practical training

**TEEYT17-1004 Thesis: 15 ECTS****LA00BN99 Thesis planning: 5 ECTS****Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

**LA00BO00 Thesis research and writing: 5 ECTS****Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

**LA00BO01 Thesis publication: 5 ECTS****Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

**TEEYT17-1005 COMPLEMENTARY COMPETENCE: 60 ECTS****Courses included in the study module**

You can find Complementary Competence courses in a separate curriculum called "Complementary Competence Courses Taught in English, Bachelor's Degree, 17S-".

In addition, you can choose Professional Core Competence courses of other Bachelor's Degree Programmes as your Complementary Competence Courses.