



RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Environmental Engineering"

Main attributes

Title	Environmental Engineering
Identification code	EBI0
Education classification code	43529
Level and type	First-Cycle Higher Education (Academic Bachelor) Studies
Higher education study field	Environmental Protection
Head of the study field	Dagnija Blumberga
Department responsible	Faculty of Natural Sciences and Technology
Head of the study programme	Jūlija Gušča
Professional classification code	–
The type of study programme	Full time
Language	Latvian, English
Accreditation	30.03.2022 - 31.03.2028; Accreditation certificate No 2022/15
Volume (credit points)	180.0
Duration of studies (years)	Full time studies - 3.0
Degree or/and qualification to be obtained	Bachelor's degree of engineering science in environmental engineering
Qualification level to be obtained	The 6th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	General or vocational secondary education

Description

Abstract	<p>The study programme focuses on the preparation of environmental specialists with extensive competence in engineering matters for work in private companies and public bodies. The cross-sectoral approach applied to the implementation of the study programme allows students to make practical use of the knowledge acquired in the theoretical part of the training to analyse and address the current problems of the undertakings/institutions in question, which allows students to integrate into the real working environment as far as possible. The implementation of the study programme focuses on the use of innovative pollution prevention technologies and their comprehensive assessment of sustainable economic development. The learning of skills and knowledge under the study programme is provided by academic and scientific staff at European level (EU experts in the fields of environmental engineering and energy, sustainable management of resources, environmental management), who are involved in the delivery of civil engineering solutions at national and European level on a daily basis.</p>
Aim	<p>The study programme aims to prepare high-profile and high-quality professionals with integrated academic education with systemic thinking and understanding, who are able to follow the development of environmental technologies and participate successfully in the implementation of environmental and climate technologies.</p>
Tasks	<p>Tasks of the study programme:</p> <ul style="list-style-type: none">• ensure continuous improvement of the quality of environmental education by training highly educated professionals for the private and public sector in the field of environmental engineering;• developing the ability of students to carry out research on climate and environmental technologies as a basis for reviewing the regulatory framework for the environment and introducing new requirements;• developing the capacity to adapt technologies and systems developed abroad to local conditions through pilot projects;• developing learners' capacity to develop innovative projects aimed at sustainable resource use and reducing environmental pollution;• promoting interaction between students and academic staff in the development of scientific works and demonstrating best practices for the practical implementation of the results obtained in environmental engineering companies, as well as publishing the results obtained;• encourage the interest of students and graduates in higher-level study programmes, lifelong learning and academic and scientific excellence.
Learning outcomes	<p>As a result of the acquisition of the study programme, the graduates (expected results):</p> <ul style="list-style-type: none">• are capable to demonstrate specialised knowledge of environmental protection systems, the nature of their elements, and the relationship between factors affecting the quality of the environment;• are able to apply theoretical knowledge and acquired skills is capable of analytical explanation of the relationship and reasoned debate on environmental challenges and offer environmental pollution prevention solutions, integrating modern environmental and climate technologies and assessing them in the engineering, economic, environmental, climate change and social aspects;• are able to independently acquire, select and analyse information, including scientific knowledge, on environmental and climate technologies, sustainable management of resources, energy production, energy efficiency, etc. in the fields of environmental engineering, and to use a scientific approach in decision-making, problem-solving and the development of economic projects;• are able to organise their own professional development in environmental engineering and related interdisciplinary areas, take responsibility and initiative in the implementation of environmental projects individually or within the team.

Final/state examination procedure, assessment	<p>The final examination procedure is Bachelor thesis, which needs to be designed in environmental engineering field. The defense of the Bachelor thesis takes place at an open meeting of the commission of final examinations in which the student defends his or her work and answers the questions raised by the members of the Commission, the Supervisor, the reviewers and other attendees. The result of the Bachelor Thesis defense is assessed on a grades scale from 1-10.</p> <p>The Bachelor Thesis assessment consists of:</p> <ol style="list-style-type: none"> 1. Individual assessment of the Bachelor Thesis provided by the evaluation committee members (incl. assessment of a supervisor as a member of the committee) of the work's content, its relevance and oral presentation. 2. The Bachelor Thesis assessment provided by a reviewer. 3. Grade characterizing the progress of development the Thesis during the semesters. <p>The thesis final rating calculation algorithm is as follows: $A = 0.6 \times (\sum A_i/i) + 0.25 \times A_r + 0.15 \times A_p$ where A – Bachelor Thesis's final grade; A_i – individual grade from each committee member; i - number of committee members; A_r – reviewer's grade; A_p – grade characterizing the progress of development the Bachelor Thesis during the semesters.</p>
Description of the future employment	<p>Graduates of the study programme with acquired cross-disciplinary knowledge in the field of environmental engineering will be able to work in the fields of environmental protection, energy (thermal energy and smart energy), energy efficiency, resource management and related industries, be able to integrate and evaluate innovative environmental and climate technology companies, be able to work in public authorities on the development and implementation of environmental legislation, and participate in the development of the field of environmental engineering at municipal level. Graduates of the programme will also be able to carry out research in the environmental engineering and energy sector, as well as to develop and implement environmental engineering projects.</p>
Special enrollment requirements	<p>The English language proficiency assessment.</p>
Opportunity to continue studies	<p>After obtaining a bachelor's degree, students have the possibility to continue their education in academic master level study programmes (e.g. the RTU academic master's study programme “Environmental engineering”) or professional master level study programmes.</p>

Courses

No	Code	Name	Credit points
A		Compulsory Study Courses	105.0
1	DE0316	Environmental Mathematics	17.0
2	DE0300	Probability Theory and Mathematical Statistics	3.0
3	DA0212	Physics	12.0
4	DA0125	Environmental Engineering Chemistry and Materials Science	6.0
5	IV0759	Civil Protection	2.0
6	SD0003	Innovative Product Development and Entrepreneurship	6.0
7	DA5104	Introduction to Study Field	3.0
8	DA5109	Introduction to Environmental Research Methods and Theory	6.0
9	DA5108	Introduction to Environmental System Dynamics Modeling	8.0
10	DA5112	Sustainable Development	3.0
11	DA5110	Introduction to Biotechnomy	6.0
12	DA5105	Air Quality Engineering	9.0
13	DA5106	Smart Energy Systems	9.0
14	DA5107	Concepts and Technologies of Waste Management	9.0
15	DA5114	Theoretical aspects of climate technologies	6.0
B		Compulsory Elective Study Courses	46.0
B1		Field-Specific Study Courses	36.0
1	DA5116	Thermal Energy Systems. Basic Course	9.0
2	DA5117	Combustion Processes	3.0
3	DA5118	Demand Side Management	6.0
4	DA5115	Basics of Systems Simulation	6.0
5	DA5119	Energy Audit	6.0
6	DA5120	Heating and Cooling Supply Systems	6.0
7	DA5102	Practice	6.0
8	DA5121	Raw Materials and Resources	9.0
9	DA5122	Environmental Monitoring	6.0
10	DA5123	Carbon Dioxide Capture, Storage and Utilisation	6.0
11	DA5113	Metrology	6.0
12	DA5111	Geographic Information Systems	4.0
13	DA0123	Air Pollution Control	6.0
14	DA1110	Microbiology of Engineering Systems	3.0
15	DA1111	Wastewater Treatment	6.0
16	DA5125	Gas and Fluid Mechanics	6.0
17	DA1117	Hydrological Processes and Modelling	3.0
18	DA1120	Artificial Recharge of Groundwater	6.0
19	DA1118	Risk Analysis of Water Resources	6.0
20	DA1116	Basics in Biology	3.0
21	DA1119	Water Treatment Technology	9.0
22	DA5103	Interdisciplinary Project	12.0
23	DA5126	Environmental Engineering. Part 2	2.0
24	DA5127	Integrated Cross-Disciplinary Project	9.0
B2		Humanities and Social Sciences Study Courses	6.0
1	DE0309	General Sociology	3.0
2	DE0258	Sociology of Management	3.0
3	DE0259	Sociology of Personalities and Small Groups	3.0
4	DE0288	Politology	3.0
5	DE0295	Political System of Latvia	3.0
6	DE0279	United Europe and Latvia	3.0
B6		Languages	4.0
1	DE0040	The Terminology Minimum in English	4.0
2	DE0037	The terminology minimum in German	4.0
3	DE0140	Latvian for Foreign Students	2.0
C		Free Elective Study Courses	6.0
E		Final Examination	23.0
1	DA5101	Bachelor Thesis	23.0