



RĪGAS TEHNISKĀ UNIVERSITĀTE

Reģ.Nr.9000068977, Kipsalas iela 6A, Rīga, LV-1048, Latvija
Tālr.:67089999; Fakss:67089710, e-pasts:rtu@rtu.lv, www.rtu.lvwww.rtu.lv

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Study programme "Environmental Engineering"

Main attributes

Title	Environmental Engineering
Identification code	EMI0
Education classification code	45529
Level and type	Academic Master (Second Cycle) 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)	120.0
Duration of studies (years)	Full time studies - 2,0
Degree or/and qualification to be obtained	Master degree of Engineering Science in Environmental Engineering
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	Bachelor degree in engineering science or natural sciences or comparable education; or bachelor degree in the fields of social sciences, commercial sciences and law, or comparable education, and at least one year of professional experience in a field related to environmental engineering and/or completed environmental engineering study courses of at least six credit point

Description

Abstract	The study programme provides knowledge and skills on the assessment and optimisation of the sustainability of existing technologies and systems (environmental, economic, social aspects); the development and optimisation of new environmental technologies and products (bio-resource based, renewables, emissions prevention, etc.); the use of bio-resources to create high added value and the long-term development of the economy through the bioeconomy focus; assessment of existing environmental management models and development of new models at company and regional level; cross-disciplinary approach to environmental challenges; conducting, evaluating, reporting and publishing original scientific studies.
Aim	The study programme aims to prepare systemically thinking, on environmental prevention and the development and deployment of innovative zero-pollution technologies oriented, high-skilled specialists with integrated academic education (Master of engineering science degree) in two specializations, "Environmental engineering", "Circular Bioeconomy" and "Climate Neutrality and Sustainability Management". Students will raise awareness of environmental technologies, learn how to assess the impact of processes on the environment at local and global level, and apply advanced methods and modeling tools to describe, quantify and qualitatively assess and resolve environmental problems.
Tasks	Tasks of the study programme: - to provide a competitive master-level academic higher education in the field of environmental engineering in two specialisations, such as "Environmental engineering", "Circular bioeconomy" and "Climate Neutrality and Sustainability Management", in line with international standards, so as to ensure continuous improvements in the quality of environmental education and to prepare highly educated environmental engineering leaders for the private and public sectors; - promoting learners' capacity to develop environment-friendly and economic-stimulating environmental and climate technologies, as well as developing learners' capacity to carry out research in the field of bioeconomy, climate and environmental technologies capable of improving the processes of the environmental sector at national and international level; - achieving interaction between students and academic staff in the development of scientific works and demonstrating best practices for the practical implementation of results obtained in environmental engineering companies at international level, as well as the disclosure of scientific results obtained in high-impact international scientific journals; - to encourage the interest of students and graduates in doctoral 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"> - demonstrate advanced knowledge and understanding in the environmental sector and are able to create values, including intellectual values, in environmental engineering, and, using theoretical, methodical and problem-solving skills, are able to critically analyse integrated solutions that match the latest findings to improve the state of the environment by focusing on long-term pollution assessment methods; - are able to manage research and professional projects and to develop comprehensive recommendations for the prevention of environmental pollution in the fields of bioresources, bioeconomy, environmental and climate technologies, environmental policy, cleaner production, smart energy, energy efficiency, climate adaptation, etc.; - are able to integrate knowledge into the implementation of environmental protection measures, contribute to the creation of new knowledge, to the development of environmental engineering research or professional activity methods, to formulate and compile scientific research results in scientific work and present these results to industry professionals and society as a whole; - the use of new learning approaches is capable of independently developing the capacity building in environmental engineering and related interdisciplinary areas, driving innovation in the field of environmental research and their deployment in the economic sectors.
Final/state examination procedure, assessment	<p>The final examination procedure is Master thesis, which needs to be designed in environmental engineering field. The defence of the Master 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 Master Thesis defence is assessed on a grades scale from 1-10.</p> <p>The Master Thesis assessment consists of:</p> <ol style="list-style-type: none"> 1. Individual assessment of the Master 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 Master 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: $A = 0.6 \times (\text{sum } A_i/i) + 0.25 \times A_r + 0.15 \times A_p$ where A – Master 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 Master Thesis during the semesters.</p>
Description of the future employment	<p>Graduates of the study programme may work as leading specialists in the fields of environmental protection, bioeconomy, energy (thermal energy and smart energy), energy efficiency, environmental status modelling, resource management and related industries, able to develop and implement innovative environments and climate technologies in companies, manage the development and implementation of environmental laws in public authorities, and manage development projects in the field of environmental engineering at municipal level. Graduates of the programme are 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	No
Opportunity to continue studies	Graduates of the study program can continue their studies at doctoral level (e.g. the doctoral programme "Environmental engineering").

Courses

No	Code	Name	Credit points
A		Compulsory Study Courses	36.0
1	DA5205	Environmental policy and economics	8.0
2	IV0001	Basics of Labour Protection	1.0
3	DA0250	Environmental Impact Assessment	6.0
4	DA5207	Intersectoral and Interdisciplinary Research Methods	6.0
5	DA5204	Environmental Technologies	15.0
B		Compulsory Elective Study Courses	48.0
B1		Field-Specific Study Courses	42.0
		<i>Environment Engineering</i>	42.0
1	DA5222	Experiment planning and simulation of processes	6.0
2	DA5226	Energy Conversion and Efficiency	6.0
3	DA0257	Renewable energy sources	6.0
4	DA0258	Environmental Chemistry and Technology	3.0
5	DA5212	Circular Economy and Waste Management	6.0
6	DA1201	Water Treatment Technology	7.0
7	DA5218	Biotechnologies	6.0
8	DA5208	Energy Efficiency and Energy Audit of Buildings	6.0
9	DA5224	Strategic Planning, Innovations and Ecomanagement	6.0
10	DA5209	Ecodesign and Life Cycle Analysis	9.0
11	DA5223	Sustainable Industrial Processes and Renewable Energy Technologies	9.0
12	DA5210	Environmental Management and Adaptation to Climate Change	6.0
13	DA5203	Interdisciplinary Project	12.0
14	DA5214	Geospatial Analysis for Environmental Engineering	6.0
15	DA5202	Internship	6.0
		<i>Circular Bioeconomy</i>	42.0
1	DA5215	Modelling and simulation of dynamic processes	6.0
2	DA5221	Case Studies on Biobased Products	6.0
3	DA5220	Bioenergy Technologies	6.0
4	DA5213	Sustainable Rural and Urban Development	6.0
5	DA5216	Development and Analysis of Biotechnomy	6.0
6	DA5217	Production of Biobased Resources	6.0
7	DA5208	Energy Efficiency and Energy Audit of Buildings	6.0
8	DA5218	Biotechnologies	6.0
9	DA5219	Carbon Economy	9.0
10	DA5210	Environmental Management and Adaptation to Climate Change	6.0
11	DA5209	Ecodesign and Life Cycle Analysis	9.0
12	DA5203	Interdisciplinary Project	12.0
13	DA5214	Geospatial Analysis for Environmental Engineering	6.0
14	DA5202	Internship	6.0
		<i>Climate Neutrality and Sustainability Management</i>	42.0
1	DA5210	Environmental Management and Adaptation to Climate Change	6.0
2	DA5209	Ecodesign and Life Cycle Analysis	9.0
3	DA5211	Environmental Audit	9.0
4	DA5208	Energy Efficiency and Energy Audit of Buildings	6.0
5	DA5203	Interdisciplinary Project	12.0
6	DA5212	Circular Economy and Waste Management	6.0
7	DA5213	Sustainable Rural and Urban Development	6.0
8	DA5214	Geospatial Analysis for Environmental Engineering	6.0
9	DA5215	Modelling and simulation of dynamic processes	6.0
10	DA5216	Development and Analysis of Biotechnomy	6.0
11	DA5202	Internship	6.0
B2		Humanities and Social Sciences Study Courses	6.0
1	DE0388	Presentation Skills	3.0
2	DE0425	Business Sociology	3.0
3	DE0516	Communication Psychology	3.0
4	DE0386	Social Psychology	3.0
5	DE0140	Latvian for Foreign Students	2.0
C		Free Elective Study Courses	6.0

E		Final Examination	30.0
1	DA0262	Master Thesis	30.0