RĪGAS TEHNISKĀ UNIVERSITĀTE

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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 Study
Higher education study field	Environmental Protection
Head of the study field	Dagnija Blumberga
Department responsible	Faculty of Electrical and Environmental Engineering
Head of the study programme	Dagnija Blumberga
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)	80.0
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" and "Circular Bioeconomy". 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 are: • provide a competitive master-level academic higher education in the field of environmental engineering in two specialisations, such as "Environmental engineering" and "Circular bioeconomy", 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; • encourage the interest of students and graduates in doctoral programmes, lifelong learning and academic and scientific excellence.

Learning outcomes	As a result of the acquisition of the study programme, the graduates (expected results): • 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	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. The Master Thesis assessment consists of: 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. The thesis final rating calculation algorithm is as follows: $A = 0.6 \times (sum\ Ai/i) + 0.25 \times Ar + 0.15 \times Ap$ where A – Master Thesis's final grade; Ai – individual grade from each committee member; i - number of committee members; Ar – reviewer's grade; Ap – grade characterizing the progress of development the Master Thesis during the semesters.
Description of the future employment	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.
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	VAS010	Sustainable Industrial Processes and Technologies	4.0
2	EAS703	Environmental Management	4.0
3	EAS722	Environmental policy and economics	5.0
4	IDA700	Basics of Labour Protection	1.0
5	EAS507	Environmental Impact Assessment	4.0
6	EVA705	Environmental Technologies	8.0
7	VAS011	Ecodesign and Life Cycle Analysis	6.0
8	VAS012	Intersectoral and Interdisciplinary Research Methods	4.0
B		**Compulsory Elective Study Courses**	**20.0**
B1		**Field-Specific Study Courses**	**16.0**
		Environment Engineering	*16.0*
1	EAS715	Experiment planning and simulation of processes	4.0
2	EAS700	Energy Conversion and Efficiency	4.0
3	EAS723	Renewable energy sources	4.0
4	ĶNF503	Environmental Chemistry and Technology	2.0
5	VAS013	Circular Economy and Waste Management	4.0
6	VAS014	Geographic Information Systems	4.0
7	BŪK504	Water Treatment Technology	5.0
8	EVA709	Biotechnologies	4.0
9	EVA708	Energy Efficiency and Energy Audit of Buildings	4.0
10	VAS015	Strategic Planning. Innovations and Ecomanagement	4.0
11	VAS016	Adapting to Climate Change	4.0
		Circular Bioeconomy	*16.0*
1	EAS744	Modelling and simulation of dynamic processes	4.0
2	VAS017	Case Studies on Biobased Products	4.0
3	VAS018	Bioenergy Technologies	4.0
4	VAS019	Sustainable Rural and Urban Development	4.0
5	VAS020	Development and Analysis of Biotechonomy	4.0
6	VAS021	Production of Biobased Resources	4.0
7	VAS014	Geographic Information Systems	4.0
8	EVA708	Energy Efficiency and Energy Audit of Buildings	4.0
9	VAS016	Adapting to Climate Change	4.0
B2		**Humanities and Social Sciences Study Courses**	**4.0**
1	EAS704	Socio-economic aspects of energy supply	4.0
2	HFL433	Presentation Skills	2.0
3	HSP488	Business Sociology	2.0
4	HSP485	Communication Psychology	2.0
5	HSP430	Social Psychology	2.0
6	VSL711	Latvian for Foreign Students	1.0
C		**Free Elective Study Courses**	**4.0**
E		**Final Examination**	**20.0**
1	EAS002	Master Thesis	20.0