



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of ENVIRONMENTAL ENGINEERING

at VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

Expert panel:

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2. Prof. dr. Tone Merete Muthanna, *member of academic community*;
3. Prof. dr. Toomas Tamm, *member of academic community*;
4. Prof dr. Dalia Štreimikienė, *representative of social partners*;
5. *Tadas Paukštys, students' representative.*

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Report language – English

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Study Field Data*

Title of the study programme	<i>Environmental protection engineering</i>
State code	6121EX035
Type of studies	University studies
Cycle of studies	1st cycle studies
Mode of study and duration (in years)	Full-time 4 years Part-time 6 years;
Credit volume	240
Qualification degree and (or) professional qualification	Bachelor's degree in engineering
Language of instruction	Lithuanian/English
Minimum education required	Secondary education
Registration date of the study programme	19- 12-2011

* if there are **joint / two-fields / interdisciplinary** study programmes in the study field, please designate it in the foot-note

Title of the study programme	<i>Environmental Engineering</i>	<i>Environmental protection technologies and management</i>	<i>Water engineering</i>
State code	6211EX033	6211EX034	6211EX035
Type of studies	University studies	University studies	University studies
Cycle of studies	2nd cycle studies	2nd cycle studies	2nd cycle studies
Mode of study and duration (in years)	Full-time studies, 2 years	Full-time studies, 2 years	Full-time studies 2 years
Credit volume	120	120	120
Qualification degree and (or) professional qualification	Master's degree in engineering	Master's degree in engineering	Master's degree in engineering

Language of instruction	Lithuanian	English	Lithuanian
Minimum education required	Higher university education	Higher university education	Higher university education
Registration date of the study programme	19-02-2007	14-06-2002	07-06-2004

*Additional requirements described in SER chapter 3.1

**Interdisciplinary study programme

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I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order [No. V-149](#).

The evaluation is intended to help higher education institutions to constantly improve their study process and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter – HEI)*; 2) *site visit of the expert panel to the higher education institution*; 3) *production of the external evaluation report (EER) by the expert panel and its publication*; 4) *follow-up activities*.

On the basis of this external evaluation report of the study field SKVC takes a decision to accredit the study field either for 7 years or for 3 years. If the field evaluation is negative then the study field is not accredited.

The study field and cycle are **accredited for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).

The study field and cycle are **accredited for 3 years** if one of the evaluation areas was evaluated as satisfactory (2 points).

The study field and cycle are **not accredited** if at least one of evaluation areas was evaluated as unsatisfactory (1 point).

1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure (hereinafter referred to as the Procedure) as approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 [Order No. V-149](#). The site visit to the HEI was conducted by the panel on 16 December 2021.

Prof. dr. Edoardo Patelli, *professor at University of Strathclyde (United Kingdom)*;
Prof. dr. Tone Merete Muthanna, *professor at Norwegian University of Science and Technology (Norway)*;
Prof. dr. Toomas Tamm, *professor at Estonian University of Life Sciences (Estonia)*;
Prof dr. Dalia Štreimikienė, *Lithuanian energy institute (Lithuania)*;
Tadas Paukštys, *student at Klaipeda State University of Applied Sciences (Lithuania)*.

1.3. GENERAL INFORMATION

The documentation submitted by the HEI follows the outline recommended by SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site visit:

No.	Name of the document
1.	
2.	
...	

1.4. BACKGROUND OF THE STUDY FIELD/STUDY FIELD POSITION/STATUS AND SIGNIFICANCE IN THE HEI

Vilnius Gediminas Technical University (hereinafter – VILNIUS TECH) is a state-owned higher education institution. VILNIUS TECH is one of the largest higher education institutions in Lithuania. The University aims to train qualified, creative and socially active professionals and R&D experts on an international level carrying out scientific research at the highest competence research institutions.

The key university subdivision for studies and research is the department. The department is independent in responding to the research and study-related challenges set for it by the university and the faculty. Laboratories can be established under the supervisions of the department. The departments are led by the heads of the departments.

VILNIUS TECH is a technically-oriented university providing first cycle studies in the field of environmental engineering since 1990, and the second cycle studies since 1994. Currently 4 study programmes are offered in the field of environmental engineering (one first cycle programme of Environmental engineering, and three second cycle programmes of Environmental engineering, Environmental protection technologies and management as well as Water engineering).

II. GENERAL ASSESSMENT

Environmental engineering study field and **first cycle** at **Vilnius Gediminas Technical University** is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	3
3.	Student admission and support	4
4.	Teaching and learning, student performance and graduate employment	3
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Study quality management and public information	4
	Total:	26

*1 (unsatisfactory) - the area does not meet the minimum requirements, there are fundamental shortcomings that prevent the implementation of the field studies;

2 (satisfactory) - the area meets the minimum requirements, and there are fundamental shortcomings that need to be eliminated;

3 (good) - the area is being developed systematically, without any fundamental shortcomings;

4 (very good) - the area is evaluated very well in the national context and internationally, without any shortcomings;

5 (excellent) - the area is evaluated exceptionally well in the national context and internationally.

Environmental engineering study field and **second cycle** at **Vilnius Gediminas Technical University** is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	3
3.	Student admission and support	4
4.	Teaching and learning, student performance and graduate employment	3
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Study quality management and public information	4
	Total:	26

*1 (unsatisfactory) - the area does not meet the minimum requirements, there are fundamental shortcomings that prevent the implementation of the field studies;

2 (satisfactory) - the area meets the minimum requirements, and there are fundamental shortcomings that need to be eliminated;

3 (good) - the area is being developed systematically, without any fundamental shortcomings;

4 (very good) - the area is evaluated very well in the national context and internationally, without any shortcomings;

5 (excellent) - the area is evaluated exceptionally well in the national context and internationally.

III. STUDY FIELD ANALYSIS

3.1. INTENDED AND ACHIEVED LEARNING OUTCOMES AND CURRICULUM

Study aims, outcomes and content shall be assessed in accordance with the following indicators:

3.1.1. Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions)

(1) Factual situation

Based on analysis of SER the study program learning outcomes are related to the needs of the EU and Lithuania in a very good way. It demonstrates a clear line between the strategy of the EU and the study program, which is very good. It ensures that the program delivers graduates with relevant skills in society. The SER reports that the study program has a good plan and strategy for how to revise the aims and learning outcomes based on trends and needs in society, both nationally and internationally.

Based on input from the SER the first cycle Environmental Engineering degree programme trains professionals who are experts in the latest environmental engineering technologies. Efforts are made to provide such level of education that the students would have the knowledge and skills required for the development and use of technology, become motivated, apply and combine engineering skills with humanities and social sciences, understand the impact and importance of engineering decisions on societal development, be well-versed in the field, apply creative and critical thinking, able to maintain their competence in life-long learning.

The second cycle study programmes in Environmental engineering, Environmental management and technology as well as Water engineering, along with other VILNIUS TECH second cycle study programmes, are designed on the basis of the goals set out in the Bologna Declaration (1999) to create a higher education space which is common, three-cycle, clear and of comparable degrees, introducing a study credit system, promoting the mobility of teachers and students, etc. Masters of Environmental engineering can continue with their studies in the doctoral programme in Environmental engineering and landscape management (T004). The study credit system of VILNIUS TECH was introduced more than 15 years ago, it is complimentary with ECTS. Therefore, the study programmes are in line with institutional, state, and international directives.

(2) Expert judgement/indicator analysis

Overall the all study programs are in very good alignment between the needs and trends in society and the aims and learning outcomes of the programs. The programs have aligned the aims and objectives all the way up to EU strategy and down to national priorities. The programs are fully aligned with the EU credit system and study progress.

3.1.2. Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI

(1) Factual situation

The SER summarises in a tabular format the study programs' objectives in a clear and concise way. Further the SER summarises the mission and research objectives of the HEI as follow; In the areas confirmed by the Smart Specialization Strategy in Lithuania (approved by the European Commission) VILNIUS TECH conducts scientific research in priority areas and subjects, including Environmental and Energy Technologies (subjects: Environmental protection technologies, Anthropogenic environment change, Resource and energy use efficiency) and Sustainable Construction (subjects: Environmentally friendly building materials and technologies). The objectives and results of the environmental engineering study programmes fully correspond to these priority subjects, and the teaching staff of the programmes conducting research in these particular fields can transfer the knowledge based on the latest research results to students.

(2) Expert judgement/indicator analysis

It is a clear presentation of alignment between department objectives and study programs' aims and learning outcomes.

3.1.3. Evaluation of the compliance of the field and cycle study programme with legal requirements

(1) Factual situation

The SER report states that the bachelor's and master's study programmes in the field of environmental engineering are a coherent set of interrelated compulsory and optional course units. They comply with the general principles of implementing VILNIUS TECH study programmes, approved by the VILNIUS TECH Senate Resolution No. 107-2.2 adopted on 11 December 2018. The programmes under assessment in the review are a part of the study field of Environmental engineering of the group of study fields of Engineering sciences (T004). The plans of all the offered study programmes were included in the annexes 1.1 and 1.2 in the SER.

A list of all the legal acts governing the programs are listed in the SER, and tables 1.2 and 1.3 describe how the first cycle and second cycle study programs under review comply with the legal acts.

(2) Expert judgement/indicator analysis

The study program presents a clear overview of all relevant laws and regulations, with a clear description of how they ensure that the laws and regulations are followed and the study program is updated and revised when/if needed.

3.1.4. Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes

(1) Factual situation

The SER report presents in detail the connection between the objectives, study results and study course units of the 1st cycle study programme in Environmental engineering, showcasing what knowledge and skills of the graduates of this study programme will be after successful completion. The interconnections between the results of the study programme and the results of the study course units as well as the methods of assessment of the studies and the student achievements are indicated in the description of each course unit (course unit/module card).

The SER describes how different methods are used during the studies: oral lectures, presentation, discussions, group work, analysis of practical examples, testing, project work, etc. Such a comprehensive system of study implementation guarantees that students will acquire the necessary subject-specific knowledge, practical skills, and will be able to summarise as well as analyse research results and will learn to use the acquired knowledge and skills in a creative manner.

Additionally, the study program envisages course projects, a comprehensive course project and a final thesis - all these are designed for project-oriented training. The implementation plans for these course units include scheduled workshops, i. e. group consultations, during which the students are provided with knowledge about project management. The complex growth path follows from homework through reports and course projects to integrated projects and finally a thesis.

The connection between the programme study results and course units as well as the harmonisation of the objectives of each programme and the expected study results with the study results of the programme course units, study and assessment methods are presented in Annexes 1.3 and 1.4 in the SER.

(2) Expert judgement/indicator analysis

The study programs present a clear overview of the progressive complexity in tasks and assignments that follows the study program progression. The assessment form is clearly demonstrated to follow the expected aims and learning outcomes. Interviews also confirmed that students are well informed about the expectations from assignments.

3.1.5. Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students

(1) Factual situation

The SER report describes that each study programme in the field of Environmental Engineering is a consistent set of study course units. The bachelor's study process in Environmental Engineering starts out with the fundamental course units covering the general world view, humanitarian, social sciences, and general theoretical subjects which form the basis for the understanding of further study course units. In order to get students interested and outline the guidelines for their future specialised studies, the special course units of the study field – Sustainable Environment (introduction to the specialisation) and Cognitive Practice – are planned in the very first two semesters. The specialised course units are concentrated in the fourth-seventh semesters. This assists in acquiring skills for the final thesis and the choice of its field. In addition to the Cognitive Practice in the seventh semester (when most of the specialised course units have already been mastered) the Professional practice of environmental engineering is introduced. An integrated project is planned for the application of knowledge and skills development of the specialised course units in the seventh semester. Course projects are also a part of the studies. The final thesis work begins in the seventh semester and ends in two stages at the end of the eighth semester.

The study course units are described to be arranged in the semesters in a logical sequence and with growing complexity. The logical interconnections of the study programme content are also ensured. The obligatory study course units (which are a prerequisite for a specific course unit) are indicated on its study module card. The process of the master's studies begins with the general compulsory course unit appointed by the university (Research and Innovation) as well as the course units of the study field consistently arranged from the first to the third semester. At the end of the second and third semesters the student submits the completed research work for grading.

The duration and arrangement of studies within semesters are also regulated by the general principles of compilation and implementation of the university study programmes (VILNIUS TECH Senate Resolution No. 107-2.2 of 11 December 2018). Therefore, the programme was compiled in accordance with the requirements of this document. The Bachelor's study programme in Environmental engineering matches the structure of full-time studies, when the scope of the programme is 240 credits. The Master's study programmes match the structure of the full-time studies, when the scope of the programme is 120 credits.

(2) Expert judgement/indicator analysis

The SER and interviews confirm that there is a well-structured plan for the development of the competences of the students. The total numbers of credits per study cycle follow national and EU regulations. The Study program has a well-documented plan for the study. The panel also finds that students feel a difference between what they are studying and what they need to learn. For instance, students would like having subjects on climate change and more involvement in scientific research and innovative technologies, BIM, Big Data/neural networks. And lastly, the students expressed that they are not feeling satisfied with the content of the study programme.

3.1.6. Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes

(1) Factual situation

Students are given the opportunity to customise and individualise their study track both through development of their generic and subject- specific competencies. They can choose the modules according to the study programme plan of the field: The first cycle Bachelor's study programme in Environmental engineering provides two optional course units (3 credits each) in the 4th and 6th semesters. These course units can be selected from a general list proposed by the university, which is updated annually. In addition, the 1st and 2nd semesters offer a choice of foreign languages, and the 3rd semester provides an opportunity to choose the alternative social course units, if needed.

Until 2019 the bachelor study program gave options for two specialisation tracks; environmental protection or water management after the 4th semester (2nd year). However, in 2019 this was changed based on the needs and feedback from the market and stakeholders, so now the students specialise in Environmental Engineering, which was considered to be more in-line with the market.

In the second cycle study programmes: for the studies of Environmental engineering (EE), Water engineering (WE) and Environmental protection technologies and management (EPTM) 3 credits (in the 3rd semester) are allocated for optional. The alternative study course units are given 12 credits in the EE study programme; WE programme - 6 credits; 9 credits in the EPTM programme.

All the student options can be chosen in the VILNIUS TECH information system, making it easy for the study program to monitor the flow of the students and adjust if needed.

(2) Expert judgement/indicator analysis

It is found that both the first and second cycle programs give students choices of specialisation and focus that is in line with a quality program. It is important to balance the number choices for the students with the students enrolled in each course.

3.1.7. Evaluation of compliance of final theses with the field and cycle requirements

(1) Factual situation

The second cycle students can choose the subject of the final thesis on their own. However, in addition to this, every year the lecturers of the programme offer their subjects for final theses, indicating the uniqueness of the topic and a possible supervisor. The final thesis is focused on raising a scientific problem and finding its solution, demonstrating the ideas and methodology in relation to the selected site. The master's thesis (MT) is completed in stages, which are partially assessed during the interim assessments.

The first stage: during the research and innovation course unit the master's students get to know about the development of research, its diversity, the levels of scientific cognition, scientific classification, organisation of scientific research, planning, error analysis, innovation policy. Abilities to apply theoretical knowledge in practical activities are fostered by working on obtaining a master's or doctoral degree. Instructions are given on preparation of publications, the possibilities of innovation financing as well as protection and management of

intellectual property. The laboratory equipment and modelling tools available at the university are presented. The student can select a preliminary field/subject.

The second stage: during Research work 1 (RW1) the students work on the description and critical analysis of the state of the chosen field on the basis of scientific publications. They formulate the problems in the field, highlight research objectives, goals and tools. A research supervisor is assigned. The foreseen research methods, required data and information are defined. Specific cases of calculations or measurements are selected. The basic schemes of the base-case scenario are prepared, preliminary calculations are performed. Basic skills to work with specialised computer software or measuring equipment are acquired. A report is prepared based on the results of the tasks set out above.

The third stage: Research work 2 (RW2) entails the following tasks: collection and systematisation of statistical and technological data required for research; performing the necessary (part of) experiments, measuring the parameters of the real technological processes; assessment and analysis of data validity and reliability; development and/or mastery and use of a computer software (own or applied) of the digital analysis model; preparation of preliminary conclusions and assessment of their reliability; preparation of the report and its theses on the obtained results; finalisation of the title of the final thesis, formulation of the research gap, object, goals and objectives for the final thesis, preparation of the content, task project and performance schedule of the final thesis.

The fourth stage: the Completion of the Research work (CRW) involves finalisation of the research carried out so far in terms of the study programme, summary is drafted, a report of the research is prepared, preparation for the defence of the final thesis takes place and then the defence itself. The student delivers a public presentation on the topic of research. The introductory part of the final paper clearly formulates the problem under analysis, the selected research object, indicates research goals and objectives, presents the selected methodologies, the modelling and/or measurement tools, and the obtained statistical or technological research data, as well as the reliability analysis. The obtained results are presented, research conclusions and recommendations are clearly and reasonably formulated. The work is formatted according to the requirements approved by the university.

(2) Expert judgement/indicator analysis

The program has a good and well documented structure for the final thesis process. The structure is clearly laid out with sufficient information.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The Study program has a clear alignment with EU strategies and goals as well as national strategies. This ensures good alignment with societal needs.
2. The program has a good plan and implementation of review cycles

(2) Weaknesses:

1. The program could add a stronger connection between the department strategies and goals and the aims and learning outcomes of the study program.

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDIES

Links between science (art) and study activities shall be assessed in accordance with the following indicators:

3.2.1. Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study

(1) Factual situation

The university has strong activities in research and it has been highly ranked in the field of Environmental Engineering. The production of VILNIUS TECH Environmental engineering per FTE exceeds that of other Lithuanian RSIs significantly.

The scholars from Chemical and Environmental Engineering (CEE) have published 155 papers indexed on the WoS, and have participated in research projects (but lack participation in international (European) funding programs). It has a large number of business partnerships related to R&D. The UoA is strong but with limited international recognition.

The Research is of a high level and recognised at national level. Research topics are on the efficient use of resources and energy, environmental protection technologies, and secure anthropogenic environment, as well as noise pollution, pollution from electromagnetic fields, distribution of heavy metals in various aquatic matrices, and so on.

Currently there are 8 PhD students (13 PhD completed their studies between 2013 and 2015).

All VILNIUS TECH teaching staff with a scientific degree is obligated to dedicate 1/3 of their working hours to scientific activities.

Good cooperation with industry (e.g. SC Orlen Lietuva, JSC Gilės inžinerija, JSC Kosana) resulting in an income of 300,000 euros in 2020.

There is also a strong cooperation with social partners (Environmental Protection Agency, JSC Toksika, companies developing environmental technologies, regional waste management centres, water supply, disposal companies, etc.) allowing internships and providing topics for final thesis for students.

(2) Expert judgement/indicator analysis

The expert panel finds a good level of international cooperation and in particular the double diploma with Riga is a very good achievement. The research is of good quality, papers are published in peer-reviewed international journals and the university has clear plans to further invest in research activities. There is a good engagement with local industry and agencies.

The study programme is also aligned with EU values and strategic action (European Green Deal, Circular economy and low-carbon economy).

3.2.2. Evaluation of the link between the content of studies and the latest developments in science, art and technology

(1) Factual situation

The lecturers of the department work on research projects for technological development and innovation as shown in Annex 3.2. The knowledge acquired during the research is transferred to the students via dedicated seminars and including updating the curriculum seeking a balance between student interest and programme requirement.

The teachers' viewpoint is delivered in consistent logical steps of the study programme structure: fundamental knowledge and/or methods, calculation algorithms and/or modelling tools, calculations and analysis, preparation and selection of solutions (methods, tools, analysis, solution).

The students learn to use the latest environmental technologies and available modern research equipment during the practical sessions. Collaboration with social partners and industry allows them to have access to relevant problems and research questions.

(2) Expert judgement/indicator analysis

The expert panel recognises that the research topics are relevant and up to date demonstrating the link between the content of study and the latest development in science and technology.

3.2.3. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle

(1) Factual situation

Usually the students are involved in scientific activity during the preparation of the final thesis. Students select the topics but the topics of the thesis do not include innovative and cutting edge development. They seem very applied and use "traditional" methods.

The department ensures not only the internationality and interdisciplinary of research and experimental development results, but also facilitates accessibility for students of all cycles (bachelor's, master's, and doctoral students).

Students (8 on average per year) are also working in the labs of the department. They also assess teachers' delivered modules during their bachelor's studies as well during master's studies. Students are also offered an internship that allows further development of their analytical skills.

The students of the programme are active participants of the scientific-educational projects and conferences: for example, "Researchers' night", "Spacecraft Earth", annual conference of Lithuanian young scientists "Science - the Future of Lithuania. Environmental Engineering", international conference Environmental Engineering, etc.

(2) Expert judgement/indicator analysis

The expert panel finds a good interaction among bachelor master and PhD students. The involvement of students in scientific activities is also facilitated by the part employment at the university, internships and involvement in international projects.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Good internationalisation and interaction among students;
2. All teachers have dedicated time for research activities;
3. Study programmes include the latest development in science and technology

(2) Weaknesses:

1. Research topics are up-to-date but not fully reflected in the topic of the thesis.

3.3. STUDENT ADMISSION AND SUPPORT

Student admission and support shall be evaluated according to the following indicators:

3.3.1. Evaluation of the suitability and publicity of student selection and admission criteria and process

(1) Factual situation

It is noted that those who have passed at least 3 State Matura Examinations and have at least a secondary education are admitted to the state-funded studies of Environmental engineering. Those who have passed at least 1 State Matura Examination and have at least a secondary education are admitted to the non-state-funded studies of Environmental engineering.

Admission takes place by the principle of competition based on a competitive score consisting of subject assessments and additional scores. Additional scores are awarded.

The number of applications for the first cycle Full-time and part-time studies in 2017, selected to study: 171; first-priority: 21; number of admitted students: 28; admitted students competitive average grade: 4.44.

The number of applications for the first cycle Full-time and part-time studies in 2018, selected to study: 97; first-priority: 12; number of admitted students: 13; admitted students competitive average grade: 5.20.

The number of applications for the first cycle Full-time and part-time studies in 2019, selected to study: 112; first-priority: 21; number of admitted students: 22; admitted students competitive average grade: 5.98.

The number of applications for the first cycle Full-time and part-time studies in 2020, selected to study: 60; first-priority: 4; number of admitted students: 7; admitted students competitive average grade: 6.14.

The number of admitted students varies between 7 to 28. The number of graduates who have selected the Environmental engineering programme as their first priority varies between 60 to 171. The results of 2019 were associated with a more intensive promotion.

According to the competition scores conducted in 2019 and 2020 of the admitted students the average was about 6.06. The distribution of students by gender is almost equal with 55% of students being women and 45% being men.

(2) Expert judgement/indicator analysis

The panel finds the criteria and process for selecting and admitting students are reasonable. During the evaluation, it was noted that the selection and admission criteria were fair in the eyes of the students. Students at VGTU understand how difficult it is to meet the bare requirements. There have been no significant complaints.

3.3.2. Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application

(1) Factual situation

Since 2015 VILNIUS TECH has acquired the right to carry out the academic recognition of education and qualifications related to higher education and acquired in accordance with the educational programmes of foreign states and international organisations.

A candidate seeking recognition of competencies through non-formal and self-managed learning must have at least a secondary education background and at least 3 years of practical work experience in the field for which recognition of competencies is requested. The amount of study credits that can be earned for the competencies acquired during non-formal and self-managed learning does not exceed 75% of the scope of the study programme to be studied.

Environmental protection engineering and management master's programme is delivered in English.

(2) Expert judgement/indicator analysis

VGTU provides guidelines for recognition of foreign qualifications, partial studies and other types of education methods. The procedure of recognising qualifications acquired abroad and partial studies at University is approved by the order of LR Minister of Education, Science and Sport. It was indicated that candidates can present their competencies through non-formal and self-managed learning, however non-formal and self-managed learning should not exceed a specific percent of the study programme to be studied. Panel finds that such procedures are not known to all the students.

3.3.3. Evaluation of conditions for ensuring academic mobility of students.

(1) Factual situation

Ensuring academic mobility creates additional opportunities for students to improve their performance, get to know other cultures, and establish international contacts.

Local students can go abroad to study. During 2016-2019 a total of 41 students of the bachelor's and master's study programmes studied abroad.

In the 2017-2018 acad. y. 10 students came to study from abroad; during 2018-2019 academic years- 19 students; 2019-2020 acad. years - 9 students.

In the academic years of 2016-2019 16 Master students went abroad, 13 of them were at Riga Technical University as a part of the double diploma programme. Some students defended their master's theses in the mentioned university.

(2) Expert judgement/indicator analysis

VGTU provides an opportunity for student mobility under the Erasmus + programme. During evaluation it was indicated that the students are willing to participate in mobility programmes.

3.3.4. Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field

(1) Factual situation

VGTU lecturers inform the students about the study procedure, the activities of the dean's office, departments, students' rights, responsibilities, the procedure for awarding scholarships and one-time social benefits, and academic schedule. They help students to get involved in social activities, student representation office activities, initiate meetings to discuss the issues of study quality and group community life.

The staff of the Academic Support Centre organise consultations and seminars for VILNIUS TECH students on the questions of career choice, internship and job search.

The department and the dean's office staff cooperate with employers and advise students on career opportunities. The staff cooperates with student organisations, participates in joint activities of teachers and students, organises student surveys and meetings, discussions, conferences.

Upon request all students are provided with dormitory services next to VILNIUS TECH educational buildings.

Social support for students is provided by awarding incentive scholarships for study results, one-time incentive scholarships from VILNIUS TECH and faculty scholarship funds, social scholarships as well as personal scholarships.

Students are granted benefits for tuition fees according to the order approved by the rector of the university.

Psychological support for students is provided who want to drop out. In addition, student oriented psychological seminars and workshops were organised.

(2) Expert judgement/indicator analysis

The panel recognises that VGTU provides opportunities for students to meet potential employers, participation in different conferences, competitions and research activities, however they would like to have more meetings with employers and field engineering guest lectures.

The panel finds the support provided by the VGTU to students in academic, financial, social, psychological and personal fields. Students are aware about Student representatives as a bridge between students and faculty.

3.3.5 Evaluation of the sufficiency of study information and student counselling

(1) Factual situation

The study programme is provided in the first semester during the module of “Introduction to the specialisation (Sustainable Environment)”. One week per semester is devoted only to consultations, all lecturers are involved only in counselling of the students, lectures are not held. In almost all master’s study course units 1 hour per week is devoted to consultations.

All students can consult with the teaching staff of the programme. Each lecturer assigns visiting hours for additional counselling and each semester lecturer availability hours are scheduled. During the course of the semester each of the lecturers consults the students on important study questions during the visiting hours. Students can also attend consultations before the examination of each study course unit. Teachers advise the students in work rooms, communicate online, via the “Moodle” environment and by phone. Their e-mail addresses are published.

During the Covid-19 pandemic the studies were conducted remotely via the “Zoom” platform.

(2) Expert judgement/indicator analysis

VGTU uses various communication channels to provide information. They provide general information on VGTU official and some other social media websites. It was noted that most relevant information about studies and learning, communication, cooperation and information exchange purposes are announced openly on the environment - “Moodle” and “Zoom” platforms. Consulting and counselling is provided additionally and on scheduled hours.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Flexibility with digital equipment;
2. Easy adaptation to the pandemic situation;
3. Flexible staff Counselling.

(2) Weaknesses:

1. Room for improving mobility with other international-national projects.

3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

Studying, student performance and graduate employment shall be evaluated according to the following indicators:

3.4.1. Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes

(1) Factual situation

Since 2020 due to lockdown, distance learning with virtual learning environments like Moodle, Zoom, MS Teams, etc) has been commonly used for teaching. Before it was applied mainly for students who chose the distance learning form during admission to the university.

In all the study programmes assessed the study process is organised by combining various learning methods: lectures, workshops, laboratory work, self-managed work and internships. The teaching staff is encouraged to use innovative teaching methods during their lectures: seminars, group work, problem-based learning, mind mapping, debates, study trips, writing reports and papers, information search and summary as well as preparing and presenting reports, interactive games, mobile applications.

During self-study work students prepare homework and course papers, course and integrated projects. Students can consult with teachers individually or in groups.

Students' knowledge and skills acquired during the studies are assessed according to a 10-grade scale and based on the cumulative assessment criteria defined in the Student Performance Assessment Procedure directly related to the study results.

For assessing the results of the course unit, the following forms of the full credit (FC) can be applied: examination (E), pre-examination (E1), credit (C), practice report (R), term project (TP), integrated project (IP), research work (RW), final thesis / project (FT/P).

The studies of each course unit (module) are completed by the full credit (FC) assessed by a grade or a credit record passed/ failed. The final assessment of the course unit (module) is calculated according to the proportions provided in the description of the course unit (module) by putting together the percentage of the assessed interim credits and full credits. All interim assessments are assessed with a grade, except for certain parts of the final thesis (FT1 and FT2), which get a credit and must be received to proceed to final assessment (examination session). Interim credits and the full credit are earned if each of the credits meets the requirements not lower than the threshold level of performance. The teaching staff member may increase the assessment of the full credit (FC) up to 10% considering the active student involvement and/or assignments completed in good quality.

Graduates of Environmental engineering Bachelor' meet the requirements for admission without any additional (equalising) course units in 16 study programmes of VILNIUS TECH and 36 master's study programmes in 9 Lithuanian higher education institutions. After completing their master's degree, the students can continue with their doctoral studies.

(2) Expert judgement/indicator analysis

The panel finds the study forms and methods including teaching delivery mode (Moodle, Zoom, MS Teams, etc) adequate to promote active engagement of the students.

The monitoring and review of the quality of teaching methods is performed on a regular basis.

The structure of assessment is appropriate for a comprehensive and objective assessment of student performance. Students can see the results of interim and final credits, as well as the final assessment in the university information system. Students are satisfied with the assessment system and consider it as objective and fair.

Organization of student's individual work and evaluation are well-described and are acknowledged by students.

Further opportunities for graduates to pursue studies are well-described and are known by the students.

3.4.2. Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs

(1) Factual situation

Students with special needs meeting the established criteria are granted a monthly targeted financial assistance that is used by the disabled student to increase the accessibility of studies, e.g. hire translators/consultants, use the transportation services to go to university, purchase the necessary equipment for studies, etc. Persons with a working capacity level of 55% or less (disability groups I and II) are exempted from the registration fee and do not pay a charge for submitting an application.

The special software and hardware, specialised furniture and various tools for students with disabilities have been provided to help create a user friendly environment for students with disabilities at the university. Training for teaching staff members to provide them with necessary knowledge in work with students having special needs.

All of the university facilities are fully adjusted for students with disabilities at the university premises. Psychological counselling is available for students with disabilities, providing emotional support, certain information and referring to the appropriate medical facility, if necessary.

(2) Expert judgement/indicator analysis

There are good infrastructure and other conditions in place to ensure access to study for students with special needs, including financial support; however during the period under evaluation, there were no students with special needs among those enrolled in the SPs.

3.4.3. Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress

(1) Factual situation

The Description of the procedure for organising surveys of VILNIUS TECH study process participants includes mandatory completion of several surveys. Surveys are conducted at different times and presented to different members of the VILNIUS TECH community. There are following surveys: student survey on teaching quality at the end of each semester; student survey on study programme execution; teaching staff survey on study programme quality once every 3 calendar years; Administration staff survey conducted once every 3 calendar years; student survey on study choices conducted at the beginning of the academic year; survey for exchange students conducted at the end of each semester; the survey of students who terminate their studies voluntarily conducted in person; surveys for graduates on career opportunities and social partners/employers are conducted just if required by the representatives of the departments.

The results of surveys are discussed at the meetings of the rectorate, the deans discuss them in their faculties, study programme committees, and meetings with students. The appropriate decisions are made based on surveys. Also, feedback to students is provided via *mano.VilniusTech.lt* system. The results of these surveys are also used for self-assessment.

Students can see not only the summarised survey results of their faculty and study programme, but also the comments of the deans of the faculties on the actions taken in the faculties, with the consideration of the results of the surveys.

If any negative trends can be seen from student surveys, additional actions can be initiated: teaching staff interviewed by the psychologist, additional lecture supervisions followed by personal feedback to the lecturer and advice on how to improve the teaching process and necessary training can be offered.

(2) Expert judgement/indicator analysis

There is a quite complicated system of monitoring applied by the university. The results of these surveys are used for the improvement of study quality. However, it is not clear how these different monitoring systems and survey results are integrated together and how the feedback is provided for other respondents except students.

The students can see the results of the surveys of the study programme and the actions taken by the Dean, with the consideration of the results of the surveys.

3.4.4. Evaluation of employability of graduates and graduate career tracking in the study field.

(1) Factual situation

Monitoring of graduates' employment and careers is carried out via surveys. In 2020, the "Graduate Survey on Studies and Careers" and the "Survey of Social Partners and Employers" was performed.

The graduates' survey indicated the main tendencies: that the majority of graduates found their first job while studying at VILNIUS TECH and that it was a job corresponding with the specialist field acquired at VILNIUS TECH. Just 5% of respondents are currently not employed.

Social partners survey indicated that 25% of employers indicated the shortage of Environmental protection and water engineering specialists in the labour market and 50% indicated a shortage in part. 87.5% of the employers assessed the study programme graduates' knowledge and skills as being satisfactory or partly satisfactory;

The data on graduate employability provided by the Government Strategic Analysis Centre (STRATA) shows just data on General Engineering, and it is not possible to isolate data on the careers of environmental engineers. However, based on Employment Service under the Ministry of Social Security and Labour of the Republic of Lithuania information on graduates 18 months after their graduation, who are registered in the database as looking for the job, just one graduate from Environmental Engineering Bachelor's study programme in 2018 was registered.

(2) Expert judgement/indicator analysis

The panel finds the perceptions of graduates' professional preparation and competences after graduation very positive, showing high employability. Nevertheless, this information is being gathered not in a systematic way through surveys of graduates and social partners/employers, as these surveys are usually conducted just if required by the representatives of the departments. Therefore, the data is not very reliable and compatible. During the visits and the meetings with alumni, social partners and employers, a very positive opinion about graduates' competences is obtained.

3.4.5. Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination

(1) Factual situation

Relationships between members of the academic community are based on the principles of respect, goodwill, impartiality and non-discrimination. These principles are violated by: discrimination against members of the academic community in speech, actions or academic evaluation, as well as tolerance of such discrimination; humiliation of a member of the academic community by using one's supremacy.

All lecturers, enrolled and non-enrolled students are required to follow the principles of academic integrity defined in the Code of Academic Ethics of Vilnius Gediminas Technical University.

The lecturer is obligated to report to the university administration or the Legal and Ethics Committee on all cases of student dishonesty, such as plagiarism, cheating, falsification of data, fabrication, falsification of examinations, submission of someone else's written work as their own, earning money by preparing written papers/theses for other students, purchasing

a written paper/thesis and submitting it to a member of the academic community for evaluation, submitting the same evaluated written paper/thesis when earning credits for another course, etc.

To prevent cases of dishonesty the head of the department may appoint more lecturers or use student representatives during the interim and final evaluations. If the fact of dishonesty is established, the student's work will not be evaluated. The dean imposes a penalty on the student for dishonesty in the form of a reprimand or in the form of a severe reprimand. In case of this penalty the student must re-study this study course unit (module). Upon recurrence of a dishonesty case the dean shall provide a proposal to the rector for expulsion of the student.

Each student enrolling at the university signs a student's declaration of academic integrity, which is valid for the entire term of the study contract. This declaration can also be signed by the non-enrolled students in accordance with the procedure established by the university.

There is a specialised text-matching check-up system implemented. It checks the similarity score.

(2) Expert judgement/indicator analysis

The panel finds procedures in places to ensure the effectiveness implementation of policies to ensure academic integrity, tolerance and non-discrimination. Teachers and students are aware about these procedures and requirements. No cases of academic dishonesty, intolerance or discrimination have been reported in any of the department's programmes over the last 3 years.

3.4.6. Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies

(1) Factual situation

The student has the right to file appeals regarding violations of the knowledge assessment score and/or knowledge assessment procedures. The student has the right to file appeals for both positive and negative assessments of knowledge; appeals related to the final theses, examinations held in the presence of commissions, as well as credits in accordance with the aviation standards may be filed only for violations of knowledge assessment procedures.

There are clear procedures for appeals established. The student, disagreeing with the examiner's explanations, can within 10 calendar days submit a written appeal addressed to the head of the department regarding the violations of knowledge assessment and/or knowledge assessment procedures. Upon the receipt of the appeal an Appeals' Commission is organised consisting of 3 teaching staff members. The teaching staff member who has assessed the examination cannot be a member of the commission.

(2) Expert judgement/indicator analysis

The panel finds the procedures adopted adequate to ensure the effectiveness of the application of procedures for the submission and examination of appeals and complaints. Teachers and students are aware about these procedures however, over the last 3 years, no appeals or complaints about the study process have been submitted in any of the study programmes of the department.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. There are well-established relationships with social partners including alumni having a positive impact on the quality of the programme. Graduates and social partners provide information about the current demand for environmental engineering specialists in the market and about employment opportunities. It also brings employers and students together for internships and subsequent employment.

(2) Weaknesses:

1. There are no weaknesses identified so far.
2. The minor shortcoming is the existence of various surveys conducted at different times and presented to different members of the VILNIUS TECH community. Some of them are not on a regular basis and it is not clear how the results of these surveys are applied for improvement of study quality. Therefore it is recommended to take this issue into account and to develop a more transparent monitoring system.
3. The main recommendation is to continue further the activities that have been launched to increase the attractiveness of these study programmes among potential students as popularity of study programmes in environmental engineering is on a decline among potential students though there is high demand for environmental engineers in the market.

3.5. TEACHING STAFF

Study field teaching staff shall be evaluated in accordance with the following indicators:

3.5.1. Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes

(1) Factual situation

The teaching staff of all SPs conforms to high standards. For the 1st cycle, 5 Professors, 32 Associated Professors and 27 lecturers are involved in the implementation of the curriculum. For the 2nd cycle, 5 professors, 18 Associated Professors and 1 lecturer are involved in the implementation of the curriculum (2019-2020 data). In general, the number of teaching staff has decreased during the last period. The average ratio between the number of teachers of the study field courses and students for 1st cycle and 2nd cycle is 1:1,5 and 1:2,04, respectively. It is not economically sustainable. Indeed, teachers can devote more time per student, but the drawback of low ratios mean that SPs are not economically viable in the long run. All SP lecturers are active researchers and focus on high-level research. This conclusion is

based on the analysis of teachers' h-index values. In fact, this university has the highest scientific and practical competence in environmental engineering in Lithuania.

(2) Expert judgement/indicator analysis

The presented indicators showed that the qualification and competence of the lecturers are high, the requirements arising from the law have been met. The low teacher-student ratio is worrying and urgent action is needed to address it.

3.5.2. Evaluation of conditions for ensuring teaching staffs' academic mobility (not applicable to studies carried out by HEIs operating under the conditions of exile)

(1) Factual situation

The university has considered teaching visits as an input to the variable component of remuneration of salaries. Foreign Relations Office is responsible for informing teachers about opportunities, and there are personnel for incoming and outgoing staff of ERASMUS+ Programme. The list of outgoing staff visits also includes other travel purposes, e.g. COST Action, international conferences and meetings of the VGTU and RTU double degree curriculum management committee. During the reference period (2017-2020) the incoming mobility related with SPs was 18 visits compared to 36 outgoing visits, including the ERASMUS+ programme and other objectives.

(2) Expert judgement/indicator analysis

The VGTU has a well-developed system for supporting the mobility of staff. Thanks to international cooperation, employees actively use the opportunities offered and show a high motivation to gain new experience, improve their qualifications and increase their international visibility.

3.5.3. Evaluation of the conditions to improve the competences of the teaching staff

(1) Factual situation

VGTU has integrated professional development, including didactic competencies, subject-specific and scientific competencies, into the attestation system. Group of Educational Competences (ECG) analyses the need for educational competencies, conducts didactic seminars and promotes innovation in teaching and learning. The list of available training seminars is updated twice a year. The university has mandatory professional development targets (e.g. 40 academic hours during the employment contract period) related to the teaching experience at the university. Also, the current regulations of teachers' internships and internship reports, which show the experience gained, have been deliberately reflected. The active international communication described in the previous chapter contributes to the improvement of competencies.

(2) Expert judgement/indicator analysis

The conditions for upgrading staff competencies can be considered excellent and the teaching staff are making effective use of the opportunities offered by the university.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The lecturers of the SPs meet a high level both in terms of scientific competence and teaching experience.
2. Lecturers actively participate in research and teaching mobility.
3. The internship of the lecturers is well organised.

(2) Weaknesses:

1. The high number of associated professors imply that some factors distress the further development for gaining a full professorship.

3.6. LEARNING FACILITIES AND RESOURCES

Study field learning facilities and resources should be evaluated according to the following criteria:

3.6.1. Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process

(1) Factual situation

Infrastructure of the Department of Environmental Protection and Water Engineering is modern and well suited for running all four SPs. 1st cycle students do their laboratory work in study laboratories, and 2nd cycle students do their research work in research laboratories. All necessary laboratories are available to provide good environmental engineering skills, e.g. Laboratory of physical pollution, Laboratory of environmental chemistry, Laboratory of environmental technologies, Laboratory of hydraulics, and Water supply lab including water microbiology laboratory. The mobile laboratory (minibus) also has several purposes, e.g. to attract schoolchildren to learn environmental technology. The number and quality of lab equipment are impressive. The software for modelling and simulation of air, water and soil pollution is state-of-the-art, as is other software needed to train engineers (e.g. CAD-programs, MATLAB, etc). The Central Library is of a good standard, it has the necessary textbooks, scientific databases and enough space to study.

(2) Expert judgement/indicator analysis

The facilities, laboratories and information resources available for learning and research offer excellent opportunities for all environmental engineering curricula.

3.6.2. Evaluation of the planning and upgrading of resources needed to carry out the field studies

(1) Factual situation

The renewal of laboratory equipment is based on a list of priorities at departmental level. The Environmental Protection Research Institute has also been involved in purchasing new equipment in order to involve the institute's strategic goals. Problems related to the decrease in the number of students, such as the financing of studies, the financing of study laboratories, have also been addressed in the SER.

(2) Expert judgement/indicator analysis

There are very good opportunities for high-level teaching and practical activities, such as the opportunities implemented in different laboratories. The problem of funding for studies needs attention.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Well-equipped teaching and research laboratories;
2. State-of-the-art software for modelling and simulation of air, water and soil pollution;
3. Prioritization when deciding on the renewal or new purchase of laboratory equipment.

(2) Weaknesses:

1. The problem of financing studies and maintaining study laboratories, which is related to the decrease in the number of students.

3.7. STUDY QUALITY MANAGEMENT AND PUBLIC INFORMATION

Study quality management and publicity shall be evaluated according to the following indicators:

3.7.1. Evaluation of the effectiveness of the internal quality assurance system of the studies

(1) Factual situation

The SER and interviews describe a well-structured system that involved the entire teaching staff of the study program. The entire teaching staff is involved in the drafting and improvement of the study programmes because the modules of the study course units of the programme are developed in the departments after evaluating the comments and requirements of the social stakeholders and students. In the process of updating the programme in compliance with its goals and expected study results, a matrix of study programme goals, study results and study course unit interconnections are formed to describe the placing of the study course unit modules in the study programme and their connections with other study course unit modules.

The responsibility framework for the implementation of the programme and for quality assurance are determined based on the positions of the members of the faculty committee and study program committee (SPC). The main internal decision-making bodies at the university level are the university Study committee, the rectorate and the senate. The faculty level institutions are the SPC, the Faculty study committee and the Faculty council.

The actions and procedures ensuring the internal quality of studies, the VILNIUS TECH study programmes and the quality assurance process, as well as the responsibilities of the programme executors are described in documents of different levels: VILNIUS TECH vision, mission, science and study quality management system model description, long-term development plans, the Statute, study regulations; general university procedures; subdivision quality policy; in the programme and module descriptions, methodologies, procedures and other internal and external documentation regulating the study and research activities of the programme and modules.

Ensuring the internal study quality. The university's internal study quality assurance system is based on the European Standards and Guidelines for Quality Assurance in Higher Education (ESG). The University implements the following processes and procedures to ensure the

internal quality of studies: The description of internal study quality assurance of Vilnius Gediminas Technical University (19 May 2020, resolution No. 118-1). The review of the results for the study programme is initiated and coordinated by the study programme committee and the faculty study committee. The results of the study programmes are adjusted based on the updated objectives of the study programmes, the content of the study course units and the specific aspects of the specialists to be trained. Stakeholders and students who are members of both committees are also involved in the review of study results. The Study program uses social media actively to communicate with stakeholders, graduates and students. Additionally, the teachers supervising the study course unit conducts annual reviews of its content and make improvements, if necessary. When the course unit is launched, the teaching staff provides students with the updated detailed course unit descriptions.

(2) Expert judgement/indicator analysis

The committee finds that the university has a sufficient internal quality assurance program for the study program. However, it is a potential concern that it appears overly bureaucratic with many steps and committees which increases the risk of pulverised responsibilities. It was also not clear from the interviews if student complaints were actually handled properly. It was just reported that they did not have complaints. A high quality study program should be open for complaints and implement a good way to ensure an independent assessment of complaints.

3.7.2. Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance

(1) Factual situation

The SER reports a close cooperation with companies and organisations working in the recycling industry, which is closely related to the direction of Environmental engineering, have been developed during the years of the implementation of the field programmes.

In these and other companies students undergo cognitive and professional internships. The companies offer topics for course projects and final theses of students of the study programmes in the field of Environmental engineering. Their final theses are applicable in practical terms and they bring benefit to the companies.

Employers are included in the process of evaluating and improving the field programmes as members and chairmen of the degree awarding commissions. The Bachelor's Degree Awarding Commission is formed on the basis of study regulations approved by the Resolution No. 58-3.1 of 26 June 2012 of the Vilnius Gediminas Technical University Senate and the Order No. ISAK-734 of 29 April 2005 of the Minister of Education and Science of the Republic of Lithuania approved by the General Regulation in the field of technological sciences (engineering) studies. The chairman of the commission must be a professional involved in the practical application of the field, not employed at Vilnius Gediminas Technical University.

The procedure and results of the final thesis defence, suggestions and remarks of chairpersons, members and students are discussed at the department and Study programme

committee meetings on an annual basis. Recommendations for the preparation and improvement of the quality of the final theses are adopted annually by common agreement.

(2) Expert judgement/indicator analysis

The study program has a close dialog and connection to the industry it serves and stakeholders and students. The system for review and involvement is well organised and structured.

3.7.3. Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes

(1) Factual situation

The SER reports that collection, analysis and dissemination of information on the study improvement processes of the field under analysis is coordinated by the study committees. All members of the study committee are actively involved in updating the study programmes. The members of the study committee have extensive pedagogical and programme expert experience. The study committee is responsible for the structure of the programme compliant with the regulation of technological sciences and other requirements of the study programmes. The departments implementing the programme are responsible for the content, level and methodological training of the delivered study course unit modules.

Student representatives have the least experience and most of the time they replace one another in this position quite often, however, they are senior students who are well aware of the study system and know the opinions of other students.

The entire teaching staff is involved in the drafting and improvement of the field study programmes because the modules of the study course units of the programmes are developed in the departments after evaluating the comments and requirements of the social stakeholders.

During the general meetings of the study committees the requirements are formulated and the modules of the study course units provided by the departments of other faculties, their volumes, content, tasks, and task performance schedules are analysed. The study committee of the faculty performs the attestation of the study course unit modules. Subject modules are attested for a period of 1-4 years. When the attestation validity period is over, the modules undergo re-assessment. In case there are issues with the course unit content, it is reviewed, improved and the course unit module undergoes re-assessment.

The responsibility framework for the implementation of the field and for quality assurance are determined by the specific positions of the members. The main responsibility for the quality of the field belongs to the members of the programme committee and the faculty study committee.

Information on the implementation of Environmental engineering study programmes (except for data on graduates) can be found in the university information system. It currently covers almost all the areas of university activity, it is considered to be the most computerised study management process.

The information system is used to collect information for the formation of admission plans, admission of students, development of study and teaching plans, distribution of teacher workload, progress statistics, registration of diplomas, distribution of scholarships and

dormitories, submission of statistics on students, their admission and mobility, schedules. The information system contains a register of students and contains information about each full-time and part-time student. These are the questionnaire-based data that were submitted upon admission to the university and were supplemented or corrected during the study process, the orders of the rector and the dean intended for the student and other relevant information. It is sufficient for the field programme quality analysis.

(2) Expert judgement/indicator analysis

The report and interviews confirm a comprehensive and well-structured process, with a clear annual cycle of when they do what, which is really good. However, it is a concern to what extent complaints are reported and heard in an open way. For example, complaints on grades in courses go back to the same course teacher, which does not ensure an open and objective review. There should be a system for a new “external” to the course review. The complaints should be logged and measured, not with the objective to eliminate them but to track improvements over longer time periods.

3.7.4. Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI

(1) Factual situation

THE SER reports feedback in the study quality assurance process. Students, being the main party interested in the quality of studies, can contribute to the improvement of the quality of studies by cooperating with the teaching staff and the administration. All students can participate in the process of study improvement by providing feedback on their studies – expressing their opinion in student surveys organised by the university.

Feedback is provided through systematic student surveys and the use of summarised survey results to improve study programmes, facilitate the organisation of the study process and strengthen the academic staff and its skills.

VILNIUS TECH regularly conducts three types of student surveys:

- A survey for all university students about the delivered course units and the lecturers who taught them.
- The survey of the opinion of first cycle first-year students on the choice of studies at the university.
- The survey of second cycle first-year students on the quality of bachelor’s studies.

Additionally, since 2012 a survey on study conditions was launched.

Since 2007 an automated student survey system has been successfully operating in the university information system. Every year the automated survey system is used when two student surveys are organised about the delivered course units and the teaching staff: after the winter and spring examination sessions. The surveys check the quality of: teaching process, teaching methods, prepared materials, and preparation for lectures. The questionnaire is in the form of a test, i. e. the student chooses the answer to the question from the multiple choices. The teaching staff member can view his or her personal results of each survey by individually logging in to the “Teaching staff” section of the university information

system. The teachers can improve their teaching methods based on the results of the student surveys.

The results of the surveys and the solutions to the identified problems are discussed in meetings with student representation offices, academic departments, and rectorate meetings. Meanwhile, the results of student opinion surveys are also presented to the deans and teaching staff members of the respective faculties. If students express high dissatisfaction with the quality of teaching, the course unit modules cards, the teaching process can be adjusted, in individual cases teaching staff members can be replaced by new ones based on the results of the surveys. Considering the objectives of the VILNIUS TECH Development Plan for 2014-2020 the concept of student surveys is subject to review and upgrading, in order to enhance student involvement and reinforce the feedback tools.

(2) Expert judgement/indicator analysis

The university has a good system for collecting and processing survey information from students about the quality of education. The automated survey is a positive implementation as it increases the chance for open honest feedback from the students. VGTU students are more than willing to get involved in surveys to leave feedback that is used for the improvement of the quality of studies. They agree that feedback is used for the improvement of the quality of studies.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. A system in place for collection and processing feedback from stakeholders, students and industry.
2. Implemented online automated survey for students;
3. There is an efficient student's feedback system established as students can see not only the summarised all survey results of their faculty and study programme, but also the comments of the deans of the faculties on the actions taken with the consideration of the results of the surveys.

(2) Weaknesses:

1. Complex structure with many committees which can pulverise responsibilities and make it unnecessarily bureaucratic.

V. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	The program should make a stronger and clearer connection between the department strategies and goals and the aims and learning outcomes of the study program.
Links between science (art) and studies	Increasing number of students and in particular number of PhD students to increase the link between the SP and research.
Student admission and support	Communication with students needs to be improved in order to provide clear information regarding supporting service available and mobility opportunities.
Teaching and learning, student performance and graduate employment	Reconsider the marking scheme for the final thesis and assure equity in the marking process.
Teaching staff	The high numbers of associated professors imply that some factors distress the further development for gaining a full professorship.
Learning facilities and resources	Ensure a sufficient number and qualification of laboratory assistants when society returns to a normal work routine.
Study quality management and public information	The program has a complex structure with many committees which can pulverise responsibilities and make it unnecessarily bureaucratic which again can reduce the feedback. The program should also look into a border set of input beyond surveys and questionnaires from the students in general as it typically ends in participation from only a minority of the students.

*If the study field is going to be given negative evaluation (non-accreditation) instead of RECOMMENDATIONS main **arguments for negative evaluation** (non-accreditation) must be provided together with a **list of “must do” actions** in order to assure that students admitted before study field’s non-accreditation will gain knowledge and skills at least on minimum level.

VI. SUMMARY

Main positive and negative quality aspects of each evaluation area of the study field Environmental engineering at Vilnius Gediminas Technical University:

Main positive quality aspects:

- The study programmes are relevant, timely and essential to training graduates of the future, equipped with the necessary skills required to tackle the climate change emergency;
- There a good recognition of the university at international level and a good research outcomes, collaboration with international partners and joint agreement;
- The study programmes are relevant, up-to-date and well implemented. They clearly show their relevance and alignment to the sustainability goals, EU green deal and the challenges posed by climate change;
- The university has good facilities and a good IT system that supports students and staff. Library has subscriptions to relevant journals and books;
- The teaching staff is competent, approachable and active in research;
- Students are generally satisfied about the quality of study programmes, the environment and the opportunities and support provided. They like their studies and the possibility to be engaged in research. They also appreciate the opportunity offered by ERASMUS programme;
- The employers recognise the need of good graduates (that brings not only good training but also knowledge and therefore stressing the importance of research-led teaching).

Room for improvements:

- The SPs might be presented in an innovative way by for instance updating the titles of some subjects and clearly stand up and be more attractive for potential students. More emphasis on novel technology for dealing with the current climate emergency is recommended.
- Students would like to have more information on how to be involved in research projects. More meetings and events with employers would be useful. Also it would be good having more technological based subjects in the Bachelor programme (even during the first years). One important missing subject is related Climate change mitigation and adaptation strategies.
- The marking system of the thesis should be reconsidered, allowing the identification of really top students (i.e. top marks should be the exceptions, not the normality). In addition, the students carrying out the thesis as part of their work seems to have an advantage (it is necessary to evaluate the research part of the thesis, not the activities performed for the employer).

Expert panel leader

Prof. dr. Edoardo Patelli

A handwritten signature in blue ink, appearing to read 'Edoardo Patelli', is displayed on a white rectangular background.