VYTAUTAS MAGNUS UNIVERSITY

Field of Study:

CIVIL ENGINEERING (E05)

Study cycle: Second

SELF EVALUATION REPORT

October 2024

Study Field Data*

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

No	Title of the study programme	State code	Type of studies	Cycle of studies	Mode of study and duration (in years)	Credit volume	Qualification degree and (or) professional qualification	Language of instruction	Minimum education required	Registration date of the study programme	Study programme termination date (if applicable)	Study programme location
1.	Hydraulic Engineering	6211EX027	University studies	Second	part-time (3 years)	120	Master in engineering sciences	Lithuanian	Bachelor degree	1992	-	Vytautas Magnus University Agriculture Academy

Self-Evaluation Group

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GENERAL VMU INFORMATION FOR STUDY FIELD SELF-EVALUATION

INTRODUCTION

Vytautas Magnus University (hereinafter VMU or the University) was established in 1922 and re-established in 1989. It is a classical university based on the common beliefs and values of freedom, openness and dialogue, and orientated towards humanistic culture. The University provides degree studies of all three cycles – bachelor, master and PhD studies which cover a broad spectrum of fields ranging from humanities, social sciences and arts to the fundamental sciences, environmental sciences and biotechnologies.

The University's Liberal Arts education profile, with core emphasis on studying broadly themed subjects, ensures that the studies offered at VMU are comprehensive, they are not restricted to specialized, pre-defined subjects. VMU's liberal study policy lets students themselves plan their studies by choosing general study courses and part of the study field courses, they also have the possibility to move from one study programme to another and change the form of studies. Alongside a bachelor's degree diploma of their major specialty, VMU graduates can also get a certificate of minor studies and later apply for master's degree programme of another study field.

VMU works with many universities and scientists around the globe, implementing projects, enhancing student and staff exchanges, and improving the study and research system. It is an international and multilingual institution that continuously develops international networks and intercultural dialogues, participates in international scientific, academic and social projects, encourages teacher and student mobility.

VMU is managed by two collegial bodies, the Council and the Senate, and the separate managerial body of the Rector. The Council is a collegial management body which affirms the University's vision, mission and the strategy, financial and other strategic issues; the Senate is a collegial body managing the academic affairs of the University. The University is headed by the Rector, and the Rector's advisory institution is the Rector's Council.

There are 14 academic divisions at VMU: Faculty of Arts, Faculty of Catholic Theology, Faculty of Economics and Management, Faculty of Humanities, Faculty of Informatics, Faculty of Law, Faculty of Natural Sciences, Faculty of Political Science and Diplomacy, Faculty of Social Sciences, Agriculture Academy, Education Academy, Music Academy, Institute of Foreign Languages, Botanical Garden.

On 13 January 2018, the Seimas of the Republic of Lithuania approved that Aleksandras Stulginskis University (ASU) and Lithuanian University of Education (LEU) would be reorganized by merging with Vytautas Magnus University (VMU). Since 2019, Alexandras Stulginskis University began to function as the VMU Agricultural Academy. After the merger of ASU and VMU, strong interdisciplinary study programmes are developed, agricultural and biosystem engineering studies and research are constantly being strengthened. The merger of universities also significantly increased the possibilities for more efficient use of the common infrastructure and scientific equipment.

The Faculty of Engineering was established in 1946 and in the same year admitted first students into a study programme that trained graduated hydraulic engineers. The faculty has released 30 master generations. Faculty conducts postgraduate studies in the fields of Civil Engineering, Energy Engineering, Environmental Engineering, Mechanical Engineering and Production Engineering.

The postgraduate programme in the study field of study of civil engineering Hydraulic Engineering is carried out at the Faculty of Engineering of the VMU Agriculture Academy (hereinafter referred to as the Faculty). Faculty structure consists of four departments: 1. Department of Water Engineering; 2. Department of Mechanics, Energy and Biotechnology Engineering; 3. Department of Land Management and Geomatics; 4. Department of Agricultural Engineering and Safety.

The staff of the departments of the faculty are directly subordinate to the heads of departments, and the latter to the Dean of the Faculty. Dean's office consists of the dean and the heads of the four departments of the faculty. The scientific and study organization activities, as well as the organization-

al work, are coordinated by the Faculty, important issues are resolved at the Dean‘s Office meetings. The implementation of the study programme is the responsibility of the study programme committee. Research areas of the Faculty of Engineering are related to civil engineering Green construction; Biomass engineering and renewable energy resources; Smart land and water engineering; Sustainable engineering systems, climate change mitigation. The staff of the faculty works in the laboratories of the Science, Studies and Business Center “Slėnis Nemunas” in the laboratories of Structures and Building Materials; Aquatic Ecosystem Research and Modelling.
In 2021, the study programme was externally evaluated by an international team of experts, who made 12 recommendations in their evaluation conclusions. The strengths of the programme were identified in the experts' conclusions as the programme's structure and its high level of relevance to standards. The experts had suggestions for improving the management of the programme. In the context of the recommendations made, the programme has planned and carried out improvement processes, which will be described at the end of the respective evaluation area.

THE ANALYSIS OF FIELD AND CYCLE STUDIES

1. STUDY AIMS, OUTCOMES AND CONTENT

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

The United Nations' World Water Development Reports highlight that the world's demand for water is rising sharply as a result of accelerating climate change, population growth, changes in food consumption and rising energy production. When the use of water resources is regulated by means of cooperation, tolerance and mutual respect, the most advanced engineering instruments can pave the way for sustainable and peaceful development in social, economic, political, cultural and ecological aspects.
The need for water engineering specialists in the world has increased due to large-scale water resource management problems. As public concern about environmental issues grows, so does the demand for environmentally friendly technologies. Complex projects for drinking water supply, wastewater treatment, flood protection, irrigation and drainage of agricultural fields and other projects are being prepared, the quality of which depends on the skills and abilities acquired by specialists.
Looking at global practice, hydraulic engineering (water construction and technology) studies also have a deep interdisciplinary (civil engineering and environmental - water engineering) study tradition. The construction sector, in which water engineering plays an important role, is one of the most important branches of the Lithuanian economy, generating 6.9% of the country's GDP. A similar number is given in the EU. This branch can be competitive in Europe and the world today only if it is constantly modernized, using the latest technologies and techniques. In 2022, there were 1.346 million employees in the country, of which 99.7 thousand or 7.4% of all employees worked in the construction sector. However, this study programme is more focused on hydraulic engineering, one of the integral parts of civil engineering.
In the field of hydraulic engineering and hydraulic structures exploitation, there are about 120 companies (of which over 36 belong to the Lithuanian Association of Land Reclamation Companies), which employ over 5,000 employees. These and other companies in Lithuania drained
and cultivated 2.6 million hectares of waterlogged agricultural land, laid 17 thousand km of local roads and streets. They built 750 dams of various sizes, about 500 pumping stations, 100 hydropower plants and 2 thousand reinforced concrete and other bridges, a total of over 70 thousand various hydraulic structures. Complex structures have been and are being built on main roads and railways, large wastewater treatment plants, urban engineering networks as well as the Baltic Sea embankments in Klaipėda port are being reconstructed.
The part of hydraulic engineering also includes companies performing water management design works, of which there are over 40. The largest of them is JSC “Sweco Lietuva”, which researches and

designs water management objects for various purposes. The company currently employs more than 210 engineers and experts. There are also a number of individual water management design companies.
Hydraulic engineering specialists dominate in the administrations of companies and in the composition of engineering and technical personnel. The introduction of more advanced and efficient technologies has led to a small reduction in executive staff. The scope of hydraulic engineering design and contracting works has remained similar for many years and will not increase significantly in the near future.
Today, there are 373 drinking water suppliers in Lithuania, servicing about 70 drinking water supply companies established and controlled by municipalities, and taking care of wastewater management.
According to the calculations, the 2020 Agricultural Professional Needs Report indicates that, on average, the hydraulic engineering sub-sector needs to recruit 26 Bachelor's and 10 Master's degree holders in hydraulic engineering annually between 2025 and 2028 to ensure the success of the hydraulic engineering sub-sector and to develop its activities. The current number of second cycle graduates is sufficient to meet the assessed need.
According to the professional standard of the Construction sector, the results of the second cycle programme focuses on the qualification requirements of a civil engineer (qualification level VII) for design, construction and maintenance supervision as well as the intended field of construction activity.
The aim of the second cycle study programme “Hydraulic Engineering” (hereinafter – the Study Programme or Programme) is to prepare highly qualified engineering specialists capable of conducting scientific or applied research in water engineering, evaluating hydraulic structures and their impact on the environment using advanced scientific methods, integrating knowledge from different fields to solve theoretical and practical problems of water management, to analyse and model the changes of the environment as well as phenomena and processes of engineering nature with the latest information technologies.
The peculiarity of the competencies of the graduates of this programme is that some of the competencies are focused not only on Civil Engineering, but also on interdisciplinary activities, primarily in the fields of environmental engineering and agricultural sciences, which are closely related to water engineering. There are no similar programmes at other universities in the country. These are technical preconditions for the development of Lithuanian water management activities and to be competitive in today's reality. The study programme is the only second cycle programme in the field of civil engineering that prepares the Master of Civil Engineering necessary for the proper development of rural water management. These include the reconstruction of a more than 1.5-million-hectare drainage system (which in critical condition) installed more than 50 years ago, the installation of intelligent humidity control systems, the implementation of drainage and sewage treatment technologies based on research results, and the application of digital construction principles in the hydraulic engineering sector.
Graduates of this study programme successfully work in the companies and institutions of design, construction, maintenance and management of hydraulic structures, water supply and wastewater disposal (e.g. waters of Kaunas and other cities or towns) and waste management companies, environmental protection services, hydropower (Kaunas HPP, Kruonis PSPP, small power plants), bridges, inland waterway companies, ports, land reclamation, consulting companies and state institutions, as well as private companies and educational institutions. Main object of activity: design of hydraulic structures of unlimited complexity, high reliability class, supervision of their design and construction, maintenance of their construction, supervision of maintenance of their use, engineering research and supervision of engineering research, design of their construction and construction expertise, management of project and construction expertise.

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

Vytautas Magnus University Strategic Plan for 2021–2027 was approved by VMU Senate and VMU Council on November 25, 2020.
Mission. VMU is a community-based research, art and study institution, which pursues the mission of the University of Lithuania, established in Kaunas in 1922, creates liberal learning conditions for an individual, develops partnerships, takes active part in the life of Lithuania, advances the future of the country, and contributes to the global cultural and academic development.
The Strategic Plan is based on 5 fields with more detailed groups of objectives: 1. Community in harmony and consolidation. 2. International research university. 3. Studies 360. 4. Integrity of self-governance and responsibility. 5. University impact on societal development.
The for the activities of the Agriculture Academy of Vytautas Magnus University for 2021–2027 formulates the **mission of the Agriculture Academy**: cultivation of the community spirit, partnership, and long standing traditions in line with the global, scientific, and political trends for development and dissemination of the knowledge in the agricultural biotechnology, ecosystems, engineering, and social sciences to support the sustainable development of bioeconomy (agriculture, food, forest and water management domain) and rural areas, and for creation of conditions for the leaders of these sectors to grow, develop, and contribute to provision of quality food and fully-fledged living environment for every human, in harmony with the nature.
Agriculture Academy vision: The Agriculture Academy – a strong university school of agricultural sciences in the Baltic region operating on the level of the world's top universities and serving own country as well as sustainable global development.
The implementation of the mission and vision of VMU AA (defined with the need to apply the knowledge of engineering and other sciences to sustainable development, as well as providing the population with quality food and a quality living environment) is only possible with technical innovations and modern technical solutions in the global market. The aim of the study programme and the learning outcomes (e.g., "Able to design and organise the construction of modern hydraulic structures and engineering systems, taking into account forecasts of long-term environmental impact, making engineering decisions that are sustainable in relation to natural resources and energy, and applying digital technologies"; "Capable to collect, systemise, analyse and use information necessary for engineering activities to solve standard and non-standard water engineering problems, applying complex of water resources management models and the latest civil engineering knowledge and research methods") is in line with the above-mentioned mission of the VMU EAA and the strategic tasks related to the development of engineering technologies, dissemination of the most advanced knowledge and experience in sustainable use and development of water resources.
The main strategic directions of VMU AA:
Studies: to meet the needs of the agriculture, forest and **water management** domains, their infrastructure, and the related public institutions and communities for the LTQF level 6 and 7 specialists.
Research: to develop the fundamental and applied research and R&D in the priority research areas that are in line with the Green Deal policy and mission of the Agriculture Academy.
Scientific services: to develop the professional development, consultancy, expert, laboratory, and other scientific services for the specialists and managers in line with the needs of the agriculture, forest and water management domains, their infrastructure, and the related public institutions and communities.
Horizontal goal: to create a motivating and sustainably favourable environment as a catalyst for manifestation of the community members' partnership, professionalism, creativity, and healthy life.
The aim and results of the ongoing second cycle study programme "Hydraulic Engineering" are directly related to the strategic directions of the **Studies**, i.e. to meet the needs of the **water management**, its infrastructure and the related public institutions and communities of the VMU AA for 7 LTQS level specialists.

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

The composition of the study programmes complies with all the legal acts regulating the studies: the requirements of the general scope, the scope of the subjects of the study field and the scope of the final thesis, as well as the scope of contact and individual work.
The study programme consists of: compulsory study courses of the field (90 ECTS with the research work and final thesis), compulsory study courses of other fields (12 ECTS), and optional study courses (18 ECTS). The scope of research work is 12 ECTS and final thesis is 30 ECTS. The composition of the study programme is in conformance with General requirements of studies and Descriptor of the study field. This conformity is presented in Table 1.1.

Table 1.1. Programme's conformity to requirements for *master programmes:*

Criteria	Legal requirements	In Programme
Scope of the programme in ECTS	90 or 120 ECTS	120 ECTS
ECTS for the study field	No less than 60 ECTS	96-108 ECTS
ECTS for studies of other study field specified by University or optional studies	No more than 30 ECTS	12-24 ECTS
ECTS for final thesis (project)	No less than 30 ECTS	30 ECTS
Contact hours	No less than 10 % of learning	26 %
Individual learning	No less than 50 % of learning	74 %

The study programme meets the following requirements:
- Descriptor of Study Cycles in terms of the programme goals and learning outcomes that are specific for the first/second study cycle.
- Descriptor of the Study Field in terms of the programme goals, learning outcomes and the content of the programme courses.
- Competence requirements for a civil engineer provided in the professional standard of the construction sector (second cycle, VII qualification level).

The study programme plan of part-time (3 years, 6 semesters) study forms with the duration and distribution of contact and independent work are presented in Annex 1.
Learning outcomes are the basis for the scope of the courses, and the allocation of ECTS depends on the nature and complexity of learning outcomes. When learning outcomes are more complex, a higher number of students working hours is planned in the course, and more credits are assigned for such a course comparing to the one that covers learning outcomes of a lower complexity. Student workload encompasses a standard, usual number of hours necessary to complete the activities that have been planned in the course. Student workload includes their time in classes, laboratories, internship placements, making individual or group assignments, preparation for assessments, etc. 1 ECTS corresponds to 26,67 hours of usual student work time.
The programme consists of only 6 ECTS courses (except for the final thesis - 30 ECTS). In accordance with the Order of the Rector of VMU of 27 May 2024 No. 222 "Approval of the Description of the Procedures for Accounting of the Working Hours of VMU Teachers", 60 hours of contact work and 100 hours of independent work are allocated to the subjects of 6 ECTS courses (for study programmes of engineering sciences study field).
During the research work in the 2nd and 3rd semesters, 156 hours are allocated to individual work, during which the research object is selected, a literature review is prepared, the research equipment is learned to be used, the equipment is calibrated, and preliminary research is performed. 30 ECTS (780 hours of individual work) were allocated for the preparation of the master's thesis (completion of research, statistical evaluation, submission to the department, as well as defence in public).
The qualification requirements for the staff implementing the programme are evaluated in Chapter 5 and by presenting the compliance between research and courses taught in the Annex 3.

The calculation of student workload and ECTS allocation is systematically revised. The essential criterion for determining the forms of assessment, the scope of contact and independent work hours in study courses are the outcomes of the study course.

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

The learning outcomes of the study programme are formulated according to the aim of study programme and include all components of the aim. The outcomes of the study course shall be compatible with the outcomes of the study programme: a) The outcome of the study course shall cover the same or a narrower object comparing to the outcome of the programme; b) The outcome of the study course shall define the ability of the same or minor (but not greater) complexity as the outcome of the study programme. Study topics shall be formed based on learning outcomes - they shall include the objects that are included in the learning outcomes. Study methods shall be compatible with learning outcomes as well as assessment methods shall be compatible with study methods.
The coherence between the aim of the study programme, the intended learning outcomes of the programme and the study courses are presented in Table 1.2.

Table 1.2. Coherence of the field study programme aims and intended learning outcomes with the programme courses:

The aim of the second cycle study programme Hydraulic Engineering		
To prepare highly qualified engineering specialists capable of conducting scientific or applied research in water engineering, evaluating hydraulic structures and their impact on the environment using advanced scientific methods, integrating knowledge from different fields to solve theoretical and practical problems of water management, to analyse and model the changes of the environment as well as phenomena and processes of engineering nature with the latest information technologies.		
Description of learning outcomes of each study cycle	**Intended learning outcomes of the Programme**	**Study courses of the Programme**
Knowledge and its application	He/she has acquired and is able to creatively apply knowledge of technological sciences and mathematics as well as the basic principles of civil engineering and digital technologies to the solution of engineering problems in hydraulic engineering.	Restoration of Disturbed Water Ecosystems; Building Legal Regulation; Building Information Modeling (BIM).
Engineering analysis and design skills	Capable to collect, systemise, analyse and use information necessary for engineering activities to solve standard and non-standard water engineering problems, applying complex of water resources management models and the latest civil engineering knowledge and research methods.	Research Methodology; Reliability of Hydraulic Structures; Urban Water Management; Research Work -1.
	Able to design and organise the construction of modern hydraulic structures and engineering systems, taking into account forecasts of long-term environmental impact, making engineering decisions that are sustainable in relation to natural resources and energy, and applying digital technologies.	Design of Hydraulic Structures; Urban Water Management; Restoration of Disturbed Water Ecosystems; Building Information Modeling (BIM).
	Able to analyse and conceptualise new and highly advanced products, processes and systems used in hydraulic engineering, to select and apply the methods necessary for their	Design of Hydraulic Structures; Reliability of Hydraulic Structures; Research Work -2.

	analysis, and to interpret the results of the analysis appropriately.	
Research skills and practical activities	Be able to plan and carry out the analytical, modelling and experimental studies necessary for the organisation of construction, reconstruction and operation of hydraulic structures, critically evaluate their data, justify and present their conclusions to stakeholders in various fields.	Research Methodology; Hydrologic Modelling System; Optimization of water supply and sewer systems; Reliability of Hydraulic Structures; Research Work -2; Final Work of Master Degree.
	Able to select appropriate methods and methodologies, engineering equipment and software for the tasks to be addressed in the field of water engineering, know their limitations, understand the principles of organisation of engineering activities, be able to use modern technologies that protect land and water resources, and comply with the standards of civil engineering activities and safety rules.	Management of Investment Projects; Building Legal Regulation; All elective courses.
Personal abilities	Able to work independently and in a team, to be a team leader, to present his/her ideas at scientific events, and to communicate with the engineering society and the public at national and international level.	All courses
	Capable of holistically evaluate the impact of engineering solutions on society and the environment, understand the responsibility for hydraulic construction activities in environmental, economic, and social contexts, assess and manage local and international projects in the fields of water protection, management, and structural engineering.	All courses

An essential criterion for determining achievement evaluation forms of the study course is the learning outcomes of the study course. The content (topics) of the course, the learning outcomes, criteria for learning achievement evaluation, structure of cumulative score and value of its constituent parts, distri-bution of workload for students (contact and individual work hours) are provided in the course de-scriptions which are prepared by the course teachers. The compliance of the descriptions of study courses with the formal requirements is evaluated during the assessment procedure, which is conducted every three years. The course description is reviewed by the study program committee, which evaluates the conformance and the content of the course description, i. e. if the content is best for achieving the study course learning outcomes. Achievements are evaluated in contact meetings. If necessary, the de-scriptions of the courses and their content may be changed at any time by the initiative of the teacher after the program committee has been informed about the required changes.
During the implementation of the study programme, the creativity and innovation of teachers is encouraged by using a wide variety of methods of active teaching and learning and the flexibility of their use: interpretation; preparation and presentation of reports; case studies, problem solving, demonstration, preparation and presentation of projects, analysis and generalization of information, viewing videos etc.
In study courses, the forms of achievement evaluation are provided in the VMU Studies Regulatory Regulation: the cumulative score system is used to evaluate student achievements, which consists of the assessment of individual and group work, laboratory works, practice works midterms, final exam and others. The recommended percentages of individual components of the cumulative score are also indicated in the VMU study regulation. Interim evaluation includes midterm, laboratory or practice

work, individual task, homework, or other tasks. Final evaluation includes exams and presentations of *Final work*.
When preparing and updating the descriptions of study courses, the learning outcomes of the study course are combined and prepared according to the learning outcomes of the study programme. Study methods and assessment methods are also combined with each other. An example of the coherence between the study programme learning outcomes with the learning outcomes of the study course, study methods and assessment methods are presented in Table 1.3.

Table 1.3. Coherence of the field study programme learning outcomes with the learning outcomes of the programme course *Urban Water Management*, study methods and assessment methods

Learning outcomes of the study programme	Learning outcomes of the study field course	Study methods of the study field course	Assessment methods of the study field course
Capable to collect, systemise, analyse and use information necessary for engineering activities to solve standard and non-standard water engineering problems, applying complex of water resources management models and the latest civil engineering knowledge and research methods.	To identify the impact of urbanization on the hydrological regime, to define the consequences of urbanization.	Interpretation, examples, discussion, problem solving and case studies.	Question tests.
	To describe technological schemes of surface and groundwater management in urban areas.	Interpretation; discussion, performance of practical tasks, consulting.	Performance of practical work, presentation of the obtained results.
	To detail the surface and groundwater management technologies of urban areas in order to protect the created social welfare.	Interpretation; discussion, performance of practical tasks, consulting.	Performance of practical work, presentation of the obtained results.
	To detail the technologies of surface and groundwater management in flood-populated urban areas as well as in areas that have started to be urbanized, designed to protect the created social welfare.	Interpretation; discussion, performance of practical tasks, consulting.	Performance of practical work, presentation of the obtained results.
Able to design and organise the construction of modern hydraulic structures and engineering systems, taking into account forecasts of long-term environmental impact, making engineering decisions that are sustainable in relation to natural resources and energy, and applying digital technologies.	To be able to use environmentally friendly technologies in design and to choose materials and tools responsibly.	Interpretation; discussion, preparation and presentation of practical work, consulting.	Written testing. Execution of practical work, presentation of the obtained results and presentation of the report.

In order to achieve the maximum learning outcome, the division supervising the professional development of teachers - the Institute of Innovative Studies, the Study Quality Unit and the Professional Development Centre organizes teacher training to use a variety of assessment methods, achieve coherence between learning outcomes and study methods, and harmony between study and

assessment methods. The aim of preparing and updating study course descriptions is to harmonize the aim of the study programme, learning outcomes and study and assessment methods.

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

The study courses in the program are taught sequentially, in individual semesters the results of studies are also consistently achieved.
Theoretical courses (Design of Hydraulic Structures, Reliability of Hydraulic Structures, Restoration of Disturbed Water Ecosystems) studied in the first semester are necessary to form the scientific idea of the final thesis (aim and main tasks of the research). In the second and third semesters, to study Research Methodology and other courses that create preconditions (necessary outcomes) to plan theoretical and/or experimental research, to choose experimental and measurement equipment. During the Research Work – 1, the research methodology, outcomes analysis and assessment methodology, preliminary research and initial outcomes analysis are prepared. In the fourth and fifth semesters, selected in-depth study courses are studied, research is carried out according to the prepared methodology. In the last semester, the outcomes obtained during the research work are analysed and summarized, a scientific publication is prepared and presented at a conference, and the final thesis is completed. The study programme implementation plans, which also show the consistency of the study courses, are presented in Annex 1.
The scope of student workload and the distribution of ECTS are systematically reviewed and, if necessary, changed (at least once per academic year). Taking into account the rapid improvement of technology and the constantly expanding need for technical knowledge, the outcomes of the study programme and the outcomes of study courses closely related to them are periodically updated.
Short descriptions of study courses are available on the VMU study programme website. Full course descriptions and annual course teaching descriptions are provided in the Moodle environment.

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

VMU provides students with possibilities to study according to an individual study schedule in order to meet specific learning needs. The schedule is designed on the basis of the implemented study programme and individual study plans. An individual study schedule determines the distribution of the taken courses at a certain time, the number and time of consultations, the form and order of assessment, the beginning and end dates of the examination session. Studies according to the individual study schedule are regulated by Description of Procedure for Submission of an Individual Study Schedule at VMU.
The study programme gives the freedom to individualize studies. After choosing the topic of the final thesis, a plan of research (12 ECTS) and final thesis (30 ECTS) is formed from the proposed research topics carried out in the department. It is possible to choose courses (18 ECTS) to acquire the lack of knowledge and skills, but a profitable group (at least 6 students) is a prerequisite for choosing courses. Elective courses form the ability to solve engineering problems - to plan and carry out the analytical, modelling and experimental studies necessary for the organisation of construction, reconstruction and operation of hydraulic structures, critically evaluate their data, justify and present their conclusions to stakeholders in various fields. A part-time students chooses one study course in the fourth semester and two study courses in the fifth semester.
Regardless of the specifics of their chosen study programme, students can also choose to study additional competences that complement the University's formal studies: the European University Alliance Transform4Europe, Academic Kaunas, Coursera and other self-learning studies and practical activities leading to a certificate and/or microcredentials. The acquired competences can be credited to students as part of the course or assessed separately.

Moreover, the University is intercultural and multilingual that is why students have opportunities to choose various foreign languages. More than 30 foreign languages are available at the University.

1.7. Evaluation of compliance of final theses (in case of short-cycle studies – of applied projects, if they are implemented) with the field and cycle requirements

Preparation and defence of final theses are regulated by VMU Study Regulations and General Order on the Preparation and Defence of the Final Theses.
General Order on the Preparation and Defence of the Final Theses describes the general requirements for the preparation and defence of the final theses of first and second study cycle, integrated and professional studies. Special requirements for preparation, formatting, and presentation of the final theses for defence are set by faculty, who prepare methodological guidelines. In accordance with a specific study programme, they set the requirements for final theses, their preparation, defence, and special evaluation criteria.
Students can defend their final theses after completing the study programme courses. Final theses are defended at the end of the last semester. If the thesis is evaluated negatively, the student may re-defend the final thesis no earlier than six months after the first defence. Appeals for procedural violations shall be considered in accordance with the procedure laid down in VMU Study Regulations.
The content of the final theses and their compliance with the field studies are analysed by the meeting of the department. The most common topics of final theses are related to the assessment and renewal of the condition of hydraulic engineering, land reclamation, port structures, water supply and sewage engineering networks, and the durability, strength or other properties of building materials used in these structures. When ordering research, the social partners of the higher school also initiate the topics of the final theses, for example, Maintaining Navigable Depth with Groynes; Unconventional Hydropower in Sewage and Water Supply Distribution Network; Analysis of the Technical Condition of Dikes in the Burkšvai Polder in Klaipėda District; Analysis of Measures to Reduce Seepage of Žlibinai Earth Dam; The Condition of Wastewater Treatment Plants in Small Settlements of Akmenė District and Possibilities of their Reconstruction; The Influence of Soil Compaction to the Drainage System; Analysis of the Condition of Drainage Ditches and their Structures in Molėtai District; Analysis of the Condition and Reconstruction Efficiency of Bridges in the Reclamation Structures Inventory of Rokiškis District; Impact of Urbanisation in the Floodplain of the Nemunas River on the Flood Risk (on the Example of the Section from the Confluence of Nemunas and Neris Rivers to Virbaliūnai) etc. The list of all defended theses in 2021-2024 is presented in Annex 2.
The assessment of the compliance of the final theses with the requirements of the field and the cycle is submitted by the Chairman of the Final Thesis Evaluation Commission, who submits the report to the Faculty Council, which approves/does not approve the chairman's report.
On the recommendation of the Dean of the Faculty or the head of the programme group for the public defence of final theses, a commission for the assessment of the defence of 3–5 persons is formed from the study field experts - scientists, practitioners, social partners. The chairman of the commission or at least one member of the commission must be from another institution (social partners, alumni or other universities, researchers from scientific institutions). The head of the study programme committee participates in the defence of the final theses.
The final thesis is defended only in case of approbation of research results at the conference and publication in a scientific journal or science publication. Otherwise, it is not allowed to defend the final thesis in public.

Expert recommendations provided during the last external evaluation related to *Study aims, outcomes and content*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*Develop a clear and concise action plan on how to increase the number of graduates.*	*An action plan has been developed to improve the attractiveness of the study programme and attract more applicants, including marketing activities, updating the content of the study programme, strengthening relations with social partners and developing international partnerships. This action plan has been fully implemented in the period 2021-2024, resulting in stable enrolments.*
2.	*Increasing the opportunities of specialisation, internship and personalisation of studies.*	*Individualisation of the study programme is carried out in the subjects Research work - 1 (6 ECTS), Research work - 2 (6 ECTS) and Final Work of Master Degree (30 ECTS), which allow students to study a topic of interest to them. Also, during the studies, students have to choose 3 elective study subjects (6 ECTS each) out of 11 offered, and they can choose 1 additional study subject (offered from the list of additional study subjects of the programme and from the list of subjects of other study programmes of the Faculty of Engineering) in each semester. Students are informed about this possibility every academic year. The number of students studying elective and complementary study subjects must be at least 6.*
3.	*Set reasonable restrictions on admission for BSc graduates without an engineering background.*	*From 2022, the VMU rules for admission to Master's studies apply, which provide that graduates of university bachelor's degree programmes in other fields of study groups who have completed less than 60 credits of subjects in Group C of the Engineering programme will be offered additional subjects after an assessment of their eligibility to study in the Master's programme.*

Please provide main results of the self-evaluation in the area of *Study aims, outcomes and content*

Strengths

1. The second cycle study programme in the evaluated field of Civil Engineering is unique in its aims, outcomes and content, and the only one in Lithuania that prepares civil engineers for a wide range of water engineering (land reclamation, hydropower, water supply, water treatment, etc.), which ensures a reliable graduate employment niche.
2. The programme is consistent, with logical connections between individual groups of courses, meeting the applicable general requirements for study programmes, the provisions of the description of the field of engineering sciences and the professional standard of the construction sector.
3. The curriculum and subject content are based on the latest knowledge; the SPC regularly reviews and updates the curriculum, which directly reflects not only the needs of the labour market, but also the growth-oriented priorities of Lithuania and the EU in today's economic and technological development.

Areas for improvement

1. To make students equal participants in the study process. More active involvement in the study process will lead to a greater interest and focus on their studies, which in itself will lead to a higher quality of studies.

2. LINKS BETWEEN SCIENCE (ART) AND STUDY ACTIVITIES (NOT APPLICABLE IN CASE OF SHORT-CYCLE STUDIES)

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

During the 2023 international comparative expert evaluation of R&D activities of the University (Technology and Agricultural Sciences assessment unit), the quality of Civil Engineering R&D activities was assessed with 3 points out of 5 possible. It means that ongoing research is high level and recognized nationally with limited international recognition. The economic and social impact of R&D activities was assessed with 3.5 points (the research is relevant to society; the relationship with business, decision-makers and the public is appropriate for a recognised academic institution). The viability of R&D activities also wass evaluated with 3.5 points (academic staff have the capacity to maintain the quality and economic and social impact of R&D activities at the same level over the next 5-10 years). The international evaluation noted that the Department has a high level of nationally recognised scientific activity. The staff publishes research results in highly ranked, well-known scientific journals, although the number of staff is not large.

Some of the articles listed reflect the latest trends in the field. The staff of the Department of Water Engineering participates in and gives oral presentations at international conferences held in various foreign countries. Funding for R&D activities is available from both national and international institutions. The staff of the Department is actively involved in R&D projects, including projects with financial support from international organisations. The evaluation also indicates that there is still room to develop doctoral studies, to integrate more into international research networks, to develop international scientific leadership and to broaden research themes.

The evaluation report of the Study Quality Centre for 2021 states that the level of research activity of the researchers working in the Civil Engineering field of the Hydraulic Engineering study programme is 3 points. This means that this field of activity is systematically developed and has distinctive features. And the results of the 2021 Research Assessment carried out by the Lithuanian Science Council show that 1 full-time relative researcher in the field of Civil Engineering scored an average of 8.41 points (compared to the average score of 8.04 in Lithuania for this field).

The teachers of the programme carry out their research activities not only in the field of Civil Engineering (T 002), but also in the field of Materials Engineering (T 008). The main research in this field is related to the properties of concrete for hydraulic structures, green concrete (concrete containing waste) and local building materials (pressed straw, hemp concrete).

The programme's teachers (researchers) carry out research that is closely linked to EU and Lithuanian R&D&I priorities. This is directly related to the EU countries' commitment to promote sustainable, resilient and inclusive infrastructure development, which is driven by climate change, resource scarcity and environmental degradation. The main research areas are: Physical and digital modelling of hydraulic and hydrological processes; Application of Nano and other technologies in water management and construction processes; Durability studies of hydraulic engineering and agricultural building structures and materials; Drainage and irrigation systems, change of water balance elements; Water pollution and measures to reduce it, restoration of damaged aquatic ecosystems; Management and sustainable use of water resources (hydropower, flood risk management, inland waterways, renovation of water bodies) (the list of R&D projects carried out by the Department is presented in Annex 4). Recent research has focused on **digitisation, BIM (Building Information Modelling)** and smart infrastructure technologies. All of these areas are closely linked to the ongoing studies. At the beginning of each academic year, teachers adjust/update the lecture notes, laboratory/practical work, visuals, case studies and discussions of the study subjects by incorporating new scientific knowledge and their own research results (e.g. remote monitoring of buildings, sustainability, **augmented reality, drones, robotics**, scanning of structures and measurement systems based on optical technologies; micro-hydropower technologies; nano-materials; smart drainage and irrigation technologies, etc.).

The researchers of the progremme maintain relations with both Lithuanian and foreign science and studies and business partners. The main fields of cooperation are research (implementation of research projects, joint publications, organization of conferences and seminars) and studies (mobility of students and teachers). Here are some examples of successful cooperation in the period 2021-2024 in the context of international programme projects:

- Horizon Europe (HORIZON CL6-2022-Zeropollution-01-02) project – NENUPHAR – New governance models to enhance nutrient pollution handling and nutrient recycling. Grant Agreement n° 101082169. 2023-2027. Partners: CIRCE, GESTCOMPOST (Spain), AKI (Hungary), DRAXIS (Greece), STEINBEIS INNOVATION GGMBH (Germany), BORNHOLMS SPILDEVAND (Denmark), SLOVAK UNIVERSITY OF AGRICULTURE IN NITRA and others. In total 21 partners.
- Boosting the sustainability of the urban water cycle: energy harvest in water industry using micro-hydropower technology (LIFE NEXUS programme), 2018-2023. Partners: CARTIF (Spain), IMP PAN (Poland), AGULEON and SUEZ ESPAÑA (Spain).
- Hydropower solutions for developing and emerging countries (Horizon 2020 programme), 2019-2022. Partners: WIRTSCHAFT UND INFRASTRUKTUR GMBH & CO PLANUNGS KG (Germany), EUROPEAN RENEWABLE ENERGIES FEDERATION-FEDERATION EUROPEENNE DES ENERGIES RENOUVELABLES (Belgium), STICHTING IHE DELFT INSTITUTE FOR WATER EDUCATION (Netherlands) and others. In total 13 partner including 5 partners from Africa and Latin America countries.
- Horizon Europe (HORIZON-CL4-2024-TWIN-TRANSITION-01) project – PRIM-ROCK - PRocess Innovations for the Mineral industry focusing on ROasting and Calcination Kiln technologies and supported by novel pre- and post-processing, 2024-2028. Partners: ETHNICON METSOVION POLYTECHNION (Greece), SOFTWARE COMPETENCE CENTER HAGENBERG GMBH (Austria), BRUNEL UNIVERSITY LONDON (UK) and others. In total 22 partners.
- Education for Sustainable Water Bodies and Coasts, Nordplus Higher Education 2020 programme, 2020-2021. Parners: LATVIA UNIVERSITY OF LIFE SCIENCES AND TECHNOLOGIES, ESTONIAN UNIVERSITY OF LIFE SCIENCES, UNIVERSITY CENTRE OF THE WESTFJORDS (Iceland).
- Stronger Together – Strategic partnerships of the University of Silesia in Katowice within the Transform4Europe network (BPI/PST/2021/1/00065) (NAWA), 2022-2024. Partners: UNIVERSITY OF SILESIA IN KATOWICE (Poland), THE UNIVERSITY OF TRIESTE, (Italy).
- Education for Sustainable Water Bodies and Coasts (SuWaCo), Nordplus Higher Education 2023 programme, 2023-2024. Partner NOVIA UNIVERSITY OF APPLIED SCIENCES (Finland).

In total, during 2021-2024, the reserachers of the department working in the study programme have carried out 30 international and national projects of various levels, published 15 scientific articles in refereed journals (including 14 in the Q1-Q2 quartile) of Clarivate Analytics with citation (2.8-8.9) index. Presented 81 papers at scientific conferences in Lithuania and abroad. At that time, 8 PhD students (1 of them foreign) and 1 postdoctoral student were conducting research in the Department. 4 doctoral dissertations were defended.

Vytautas Magnus University's strategic action plan for 2021–2027 continues to provide for the development of R&D activities and the publication of research results in high-category scientific journals with a high citation index. Taking into account this, the researchers of the study field continue to develop their research activities and, together with partners, have submitted applications for funding of R&D activities:

- Horizon Europe EU’s Funding Programme for Research and Innovation.
- LIFE programme for EU’s Environment and Climate Action Research.
- NordForsk programme Sustainable Fisheries from Healthy Seas.

- Joint Lithuanian–Latvian–Chinese (Taiwanese) Tripartite Cooperation Programme in the Fields of Science and Technologies.
- Joint Lithuania-Poland Bilateral Research Funding Programme DAINA-3.
- Lithuanian–Ukrainian Cooperation Programme in the Fields of Research and Technologies.
- Lithuania Research Council Call for PhD Places.

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

Research and experimental development and the dissemination of scientific knowledge are an important part of the study process, as they are the highest form of in-service training for teachers. Each teacher works in parallel from the studies and research work and integrates the accumulated experience and scientific innovations into the courses EU Funds Investment Operational Program Instrument he/she teaches. The main scientific innovations that are integrated into the studies are related to the application of nano and smart technologies, digital construction, sustainable construction, modelling of hydrological and hydraulic processes, improvement of drainage and irrigation methods, sustainable hydropower, flood risk management, climate change. Students are also introduced to the scientific innovations of the field when preparing their final theses. During the period under review, the main focus of teachers on the latest scientific developments was on the application of smart technologies, the European Green Deal and the implementation of sustainability principles. As an example, several students' final theses can be mentioned: Unconventional Hydropower in Sewage and Water Supply Distribution Network; Influence of Wood Ash on Concrete Properties; Use of Ceramic Waste in Concrete Production; Effect of Irrigation System on Water use Efficiency and Usefulness of Fodder Crop Production in Nepal; Forecasting Sediments of Wind Turbine Foundations and Modelling of Geofiltration Flow; Analysis of Water Losses and Reduction Measures in Telšiai Water Supply System.
Demonstration research projects carried out by the teachers of the study field contribute to the integration of the latest scientific achievements into the study content (presentation of material through lectures, solution of practical tasks, analysis of problem situations, preparation of final theses on similar topics, group projects and teamwork assignments, inclusive teaching - integrating different perspectives into course material, hybrid and distance learning): Renewable energy sources, sustainable construction and smart barn application of the principles in agricultural production buildings; Regulation of soil moisture regime; Use of local building materials produced with low energy consumption in agricultural production buildings; Smart regulated drainage system. During the period under review, students presented 8 papers at these international scientific conferences:

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

All second cycle students prepare final theses of a research nature, and the outcomes of the research are published in scientific or popular science journals and presented at conferences. Vytautas Magnus University Agriculture Academy annually organizes a student scientific conference "Young Scientist", which is widely attended by students in the field of civil engineering. In 2021, the students of the second cycle Hydraulic Engineering study programme presented 18 reports at this conference, in 2022 - 15, in 2023 - 12, in 2024 - 11 reports. Alongside their presentations, they published an equal number of scientific articles in the conference proceedings. Students also participate in international scientific conferences in Lithuania and abroad: 4th International Conference AgroEco 2022: Agroecosystem Sustainability (Lithuania, 2022); International Scientific-Practice Conference Human and Nature Safety (Lithuania, 2022-2024); International Conference on Construction, Energy, Environment and Sustainability - CEES 2023 (Portugal, 2023); International conference European rivers - problems and challenges (Poland, 2024). Co-authored 2 popular science articles with supervisors.

During the activities of R&D projects, efforts are made to attract the most talented students to their implementation. In this way, students are interested in research and PhD studies. In the period of 2021–2024, five students (11 % from all number of programme students) were attracted to R&D activities. They worked on the following R&D projects: LIFE NEXUS project Boosting the Sustainability of the Urban Water Cycle: Energy Harvest in Water Industry Using Micro-Hydropower Technology (EU LIFE programme); BioRural project: Accelerating Circular Bio-based Solutions Integration in European Rural Areas (Horizon Europe programme) ; Study on the Ecological and Socio-Economic Assessment of Dams (Contracting authority: the Ministry of the Environment of the Republic of Lithuania); Establishment of Criteria and Development of a Methodology for Determining the Most Suitable Hydrological Drought Indicator for Natural and Catastrophic Hydrological Phenomena in Lithuania (Contracting authority: the Ministry of the Environment of the Republic of Lithuania); Development of Recommendations for Innovative Solutions to Reduce the use of Natural Resources in Aquaculture and the Use of Sludge from Aquaculture Ponds and Closed Aquaculture Systems (Contracting authority: the Ministry of the Agriculture of the Republic of Lithuania); Recommendations on Technological Standards for Fish Farming in Aquaculture Ponds and Closed Systems (Contracting authority: the Ministry of the Agriculture of the Republic of Lithuania). One student also took part in a dissemination project on Aquaculture, "Organisation of educational events in a training institution" (Contracting authority: Rural Business and Market Development Agency).
In the area of links between research and study activities, there were one recommendation made by the experts in the 2021 external evaluation, that "Most students are not willing or are not available to travel abroad and gain from international agreements and opportunities". In this context, it should be noted that all VMU students have excellent opportunities to travel to 34 foreign countries for studies, internships, short-term courses and schools under the ERASMUS+ programme. All students are periodically informed about this through the University's publicity measures. As the programme "Hydraulic Engineering" offers only part-time studies at the request of the students, this form of study limits the possibilities for students to go to foreign universities and at the same time to combine direct work in Lithuania. However, these activities are compensated for through internships/training abroad organised by their employers. In order to promote international mobility, teachers and the faculty administration motivate students to go to foreign research and business institutions. In 2021-2024, three times students participated in internships to Per Aarsleff A/S in Denmark and ATS Infrastructure Ltd. in India. More visits are foreseen in the future.

Expert recommendations provided during the last external evaluation related to *Links between science (art) and study activities*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*Find ways to involve students in international mobility programmes*	*In the search for new ways to involve students in international mobility programmes, a strong focus has been placed not only on classic mobility opportunities, but also on short-term ones, such as those offered by BOVA NOVA and the Transform4Europe alliance. During the reporting period, 4 students participated in mobility programmes and short-term placements.*

Please provide main results of the self-evaluation in the area of *Links between science (art) and study activities*
Strengths
1. High-competence specialized groups of scientists have been formed, capable of solving modern scientific tasks according to priority fields of science, which is shown by the outcomes of comparative and annual evaluation of scientific activity. 2. The Faculty has a good modern infrastructure and organizational means for the development of scientific activities.

3. The consolidation of the Faculty of Engineering allows to concentrate researchers in the field of technological sciences in a single unit and to better apply the technologies of drones, robotics, 3D printing, nano and other technologies in hydraulic engineering.
4. The studies are based on the results of ongoing R&D. Conditions have been created for students' involvement in research (through the preparation of final theses and their involvement in research project activities).
5. Students' final theses are based on research that reflects today's issues using advanced research methods.

Areas for improvement*

1. To develop more cooperation with businesses, which would help commercialise new products developed by the Faculty's scientists. This requires a greater use of specialists from the VMU Communication and Technology Transfer Centre.
2. It is necessary to encourage Faculty researchers to collaborate more with other VMU departments and other Lithuanian universities, which would lead to the formation of new interdisciplinary research directions and create more favourable conditions for participation in joint research projects.
3. Encourage students to go abroad for studies and/or internships in research and business institutions to make better use of the ERASMUS+ programme and other international agreements.

3. STUDENT ADMISSION AND SUPPORT

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

The requirements for admission to Master studies in the field of civil engineering are set out in the rules for admission, which are issued annually. Applicants apply to the VMU online admissions system.
The following are admitted to the programme studies:
- first cycle (bachelor) engineering sciences (study fields - environmental engineering, measurement engineering, civil engineering), technological sciences (study field - natural resource technologies), physical sciences (study fields - environmental science, natural geography) graduates;
- graduates of university bachelor's degree programmes in other fields of study who have less than 60 credits of Group C subjects in engineering (environmental engineering, measurement engineering, civil engineering) might be offered to study additional courses during master studies or supplementary studies, after their readiness to study in the master program was evaluated.
- graduates of college (professional bachelor's) studies and supplementary studies in civil engineering.
The competitive score of the applicants for the programme is calculated:

- For those who have obtained a university bachelor's degree $K = 0.8\ A + 0.2\ B$, where

A is the weighted average of grades in all courses in the Bachelor's Diploma Supplement.
B is the grade of the bachelor thesis.

- For college graduates: $K = 0.4\ A + 0.4\ B + 0.2\ C$ where

A is the weighted average of the grades of all courses in college studies.
B is the weighted average of the grades of all courses in the supplementary studies;
C is the weighted average of the grades of the final thesis of college studies and supplementary studies.
Supplementary studies are organized at the Faculty for graduates of the first cycle (bachelor's) of other study fields or college (professional bachelor's) studies and wishing to study in the second cycle study programme of Hydraulic Engineering. Upon completion of supplementary studies, an academic certificate is issued, which gives the right to enter the second cycle studies.
Admission to supplementary studies is announced and carried out every year. More detailed information about the admission requirements for supplementary studies is published on the websites of VMU, AA, Faculty. Information about the admission requirements and procedure is also provided

on website of VMU, AA and the Faculty, printed leaflets, study fairs, etc. In accordance with the VMU plan for informing and motivating applicants for studies, information about admission to study programs and consultations on study issues are provided in the following ways:

- those interested in the study program can get the necessary information in the Departments of Marketing and Communication and Studies of VMU;
- admission issues and the detailed information about studies, study courses are coordinated by the study administration group of VMU AA and the Faculty.

Consultations are held directly, by phone, e-mail, Facebook. The second cycle study programme Hydraulic Engineering in the field of civil engineering is presented to students in various ways, i.e. contact and remote meetings with interested in master studies, during which they are introduced to study opportunities, the content of the program, and the possibilities of professional activity. Also, letters with a program presentation and flyers are sent to colleges which are of similar profile. The focus is on the target groups:

- college students (Kaunas University of Applied Engineering Sciences, Klaipėda State University of Applied Sciences, Kaunas Forestry and Environmental Engineering University of Applied Sciences);
- social partners who encourage employees of their companies to advance their qualifications, improve, change their profile by choosing to study in the master studies of the Hydraulic Engineering study programme. Social partner companies place information about study opportunities on their internal Internet or forward newsletters to their employees by e-mails.

Graduates of Kaunas Forestry and Environmental Engineering University of Applied Sciences, Kaunas University of Applied Engineering Sciences and Klaipėda State University of Applied Sciences are mostly interested in studying in the programme, but there are also graduates from other institutions - VMU, Vilnius TECH, Kaunas University of Technology.

During the period under review, admission was granted to graduates of first cycle university studies in engineering sciences (fields of study: civil engineering, environmental engineering), as well as to graduates of colleges of engineering sciences (fields of study: civil engineering, environmental engineering, mechanical engineering) who had completed supplementary studies.

Enrolment data for the first year of the study programme analysed for the period 2021-2024 (Table 3.1.) show that the average enrolment in the programme is more than 16 students each year. In 2024, the highest number of students admitted is 18. Looking at the number of applications to the study programme, it can be noted that there is a competition for state-funded places every year. On average, the competition was 1.66 per place in the period under analysis. This competition shows that this study programme is attractive to applicants. It should also be noted that the number of admissions to state-funded places has increased year on year, with 11 admissions in 2021 and 17 in 2024.

Table 3.1. Number of applications to Hydraulic Engineering programme and number of contracts signed

Year	Number of applicants	Number of signed contracts	
		State-funded places	Non state-funded places
2021	27	11	4
2022	28	14	2
2023	28	14	2
2024	25	17	1

An analysis of the competition scores of students admitted to the programme in 2021-2024 (Table 3.2.) shows that these scores remain consistently high, indicating that these studies are chosen by motivated and well-prepared students. Comparing the 2017-2020 period with the 2021-2024 period, the average of all admission scores has increased from 7.468 to 7.999, i.e. the average of admission scores has increased by more than half a point. During the period analysed, the competition score of students admitted to state-funded places has varied between 7.8 to 8.3, reflecting the preference for the programme by students who are good performers, among whom there are some excellent

performers, such as the students admitted in 2021 and 2023, who had a competition score of 9.6 and 10 respectively. The "weakest" students admitted had a competition score between 6.6 to 6.9. This shows that those admitted with the lowest competition scores have an average level of preparation. Students admitted to non state-funded places are slightly weaker, with average competition scores ranging from 6.9 to 8.3. Looking at the lowest competition scores, those admitted in 2021 and 2022 had the lowest scores, with competition scores between 6.1 and 6.4 respectively. It should be noted that these places are taken up by applicants who are very well prepared for their studies, such as the 2021 admission with a competitive score of 9.0. In conclusion, it can be stated that the second cycle study programme Hydraulic Engineering is chosen by motivated and well-prepared applicants.

Table 3.2. The lowest, highest, and average admission scores of the students admitted to the second cycle study programme *Hydraulic Engineering*

Year	Admission scores to state funded places			Admission scores to non state funded places		
	Highest	Lowest	Average	Highest	Lowest	Average
2021	9.638	6.63	8.134	9.049	6.086	7.567
2022	9.446	6.787	8.116	7.513	6.360	6.936
2023	10.000	6.696	8.348	7.936	6.938	7.437
2024	8.704	6.905	7.805	8.264	8.264	8.264

During the last years, projects for the attractiveness of study programs of VMU AA have been actively carried out. One of the implemented projects “Knowledge Elevator” in the 2021 academic year was held remotely (10 events) and in contact (5 events), which was aimed to increase the development of rural areas and regions, to increase the attractiveness of studies related to agriculture. In the spring of 2022, a remote event “The best investment is knowledge” was organized, where second cycle study programs, their uniqueness, employment opportunities for graduates of programs were presented, deans of faculties answered questions from future students. In 2023, there was constant cooperation with the media, publications and interviews were prepared, comments from scientists, experts were provided, reports were prepared, seminars were organized, etc. In order to popularize the study programs carried out at the Faculty of Engineering, in 2023 alone, 115 articles on the popularization of science were published, interviews with the media, participation in discussions, seminars, educational videos, cooperating with various portals (www.bns.lt, www.verslozinios.lt, www.delfi.lt, www.15min.lt, www.tv3.lt, www.ukininkopatarejas.lt, www.mokslolietuva.lt, www.lrytas.lt, www.lrt.lt and others) was carried out, where the published articles reached thousands of readers. In 2021–2023, most of the content of VMU AA was published on the channels of “Ūkininko patarėjas”, in the channels of the BNS press center, on the portal www.mokslolietuva.lt. In total, over 530 posts were published on various portals. All these measures also help to popularize the master studies conducted in the field of civil engineering.

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

Description of Policy on Academic Recognition of Competences and Qualifications at VMU governs the principles, responsibilities, and means of the implementation of the assessment and recognition of competences acquired during previous formal and non-formal learning. The University’s policy on academic recognition covers the following areas: the recognition of qualifications acquired abroad, the recognition of competences acquired in partial studies, and the recognition of competences acquired through non-formal and informal learning.

Recognition of foreign qualifications at VMU is done centrally in the International Cooperation Department in accordance with resolutions and regulations of LR, Description of Procedure for Assessment and Academic Recognition of the Qualification Acquired Abroad at VMU, which describes the principles and criteria of qualification assessment, lists the documents to be submitted, and indicates the decisions that can be made, following information provided by the Centre for Quality

Assessment in Higher Education, as well as general or individual (in the absence of general) recommendations and in consultation with the responsible staff from the Centre for Quality Assessment in Higher Education. Every year, by the order of VMU Rector, Rules for the Admission of Persons Who Have Received Their Education in Foreign Countries and of Foreign Citizens Who Have Received Their Education in Lithuania to the First and Second Cycle Study Programs of VMU Implemented in a Language Other than Lithuanian are updated and approved, and they determine how the admission of such persons is organised, how candidates are selected, how admission to VMU decision notifications are delivered, etc. The International Cooperation Department also conducts assessments of qualifications for persons with education abroad as well as for those entering to second cycle study programmes to be implemented in Lithuanian or another language.
Recognition of partial learning outcomes is regulated by Description of the Procedure of the Validation of Learning Outcomes at VMU. This procedure is performed in a decentralized way at the university, and it is organised by the Faculty or the initial assessment is done by the International Cooperation Department. The learning achievements of a person who has studied at another Lithuanian or foreign higher education institution are recognised by converting the acquired evaluation into ECTS according to pre-agreed equivalents, if there is no violation of the requirements of the contract or other document. Current students participating in study exchange programmes agree on the study plan with VMU before leaving for a partner university. Learning outcomes acquired during part-time studies in accordance with the agreed study plan, should be recognised upon an academic certificate from the higher education institution where the student has been studying. If the student has been for a visit for several semesters, certificates must be obtained and credited after each semester. This ensures the recognition of partial studies after returning from another university.
Learning outcomes of a person who studied or is studying at another Lithuanian higher education institution or a foreign higher education institution according to a non-pre-agreed plan of studies or as an unclassified student are recognised after assessing the formal requirements for the validation of learning outcomes and their compliance with the requirements of the study program. Not more than 75 percent of the volume of the study program to be studied may be recognised. Final thesis and (or) final exam is not validated. Learning outcomes obtained according to a non-pre-agreed plan of studies are recognised after assessing descriptions of study courses and their compliance with the learning outcomes of the study program wich the the person is going to study.
Newly enrolled students, who have completed part of their studies at another university and apply for recognition, undergo the procedure at the faculty, academy conducting the respective studies – the correspondence of the study course content and its volume is assessed.
Principles and processes of recognition of competences acquired in non-formal and informal way are regulated by VMU Study regulations; VMU Description of Procedure for Assessment and Recognition of Competences Acquired through Non-Formal and Informal Education; Description of Procedure for Organisation of Non-Formal Education (Training Services) at VMU. Individuals may apply for the assessment of competences acquired in work activities or voluntary work, internships, courses, seminars, projects, etc.; while self-learning or at leisure time. Competences acquired by the candidate through non-formal and informal education can comply with the part of the appropriate study programme or separate courses.
If during the assessment it is determined that student's informal and non-formal learning outcomes correspond to the learning outcomes formulated in the study course of the study programme, the study course(-s) is (are) recognised.
There have been no cases of credit/non-credit for part-time study abroad in the period 2021-2024, as no students have gone abroad for part-time study. There were also no cases of crediting of competences acquired non-formal and informal during the analysed period.

3.3. Evaluation of conditions for ensuring academic mobility of students

All VMU students are provided with possibilities to use Erasmus+ opportunities:

1. To study for a semester or an academic year at one of 440 partner institutions in the EU or EEA /candidate countries as well as to go outside the EU to one of 118 partner institutions. About 200 VMU students take the advantage of this opportunity per year.
2. To participate in Erasmus + internship lasting from 2 to 12 months. Graduate students can also participate in this internship programme within 12 months after their graduation. About 150 VMU students and graduates take the advantage of this opportunity per year.
3. Since 2022 VMU students have an opportunity to go for short-term (from 5 to 30 days) study and practice mobility. In 2023 the number of VMU students going for "Erasmus+" short-term study and internship mobility increased six times compared to 2022: 84 students chose this form of mobility in 2023, while only 14 in 2022.

VMU students are also encouraged to participate in academic exchange programmes:

1. They can go for exchange with mobility scholarship or with scholarships from partner universities to one of 200 partner universities outside the EU/EEA for a semester or for academic year. About 30 VMU students use this opportunity per year.
2. Students can participate in the internship from 1 to 3 months with VMU mobility scholarship in companies/organizations outside the EU/ EEA. About 10 VMU students take the advantage of this opportunity per year.
3. They can go to short-term courses and summer/winter schools abroad with VMU mobility scholarship. In 2023, about 14 VMU students took advantage of this opportunity.
4. Students can go for internship lasting from 2 to 6 months in Lithuanian education schools, Lithuanian communities and Lithuanian centres abroad (about 15 VMU students and graduates take advantage of this opportunity per year); they can go for part-time studies or internship receiving Mockūnai scholarship (1-3 students take advantage of this opportunity per year).

Information about student mobility possibilities is announced by various channels: VMU International Cooperation Department and the Faculty/Academy international coordinator provide students with information about studies and placement abroad, VMU Erasmus days are organised, Erasmus+ competitions are posted on VMU website, intranet (*Outlook*), social media, etc.

In the period 2021-2024, there were only 1 foreign student (from Nepal) in a full course of study. From 2021 the programme will no longer offer admission in a foreign language.

The number of students taking up mobility schemes is relatively low during the period under review. There were 5 cases of internships and short-term placements abroad (Erasmus+, etc.) during the reporting period, of which three were 3-month internships in the Netherlands and India through Erasmus+ and the other two were short-term internships of one week in Poland in the context of project activities. This low number is due to the fact that a large number of students work in their free time and find it difficult to combine work activities with trips abroad. In order to increase the number of departures, once a semester, students are introduced to Erasmus+ and other mobility programmes, while those working in a specialisation (related to their study programme) are offered the opportunity to coordinate the internship themes with their employer in order to motivate the employer to let the student take up the internship.

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

Academic student support covers several aspects: 1) easily accessible and timely information on: a) the studies, including information, which is useful to the students choosing their study courses according to their individual study needs and preferences; b) University's information (Rector's orders, rules, mobility opportunities, student support information, career possibilities, etc.) in order to keep in line with institutional issues and opportunities; c) extracurricular University's activities (events, meetings, seminars, leisure and entertainment, etc.) in order to provide opportunities for students' personal development; 2) regular teachers' consultations to clarify topics of study courses or assignments, evaluate students' learning progress, provide and gather feedback both for students and teachers, etc.

Information on the studies is provided during various communication channels and means. All VMU students have free access to the University's internal system *Moodle* (virtual learning environment for publishing information on courses, methodical material, etc.). For the purposes of communication, cooperation and searching for information as well as ordering individual services, students use the student portal developed for their needs, communication also takes place using the University's e-mail and document management system *Office 365*. Besides, frequently used channels are the University website, University and Faculty *Facebook*, newsletters.

The Programme committee periodically meet with the students and discuss current, important study and career opportunities related issues. The staff of the Faculty, Academy administration office is available daily for consulting students on various academic and study organization issues. Examination results are discussed with the students during specially appointed time; the students are informed about the time of the meeting during the examination.

According to the VMU Study Regulations, every teacher spends a certain number of hours per semester consulting students on their homework, individual or group assignments and other course-related issues. Consulting is performed face-to-face during officially announced hours, as well as using different on-line means, such as *Teams*, *Zoom*, *Skype*, e-mail, discussion forums, other communication environments and tools that are convenient for teachers and students.

Financial support for students is regulated by VMU Description of Procedure for Granting Fee Reductions and Reimbursement; and Description of Procedure for Refund of the Paid Tuition Fee at VMU. Upon a reasoned request from a student, the University may postpone the payment of the tuition fee and / or the accommodation fee or allow this fee to be paid in a more extended period, for several times. In such cases, the student writes a reasoned request to the Rector, explaining the reasons why the university should allow the student to pay under specific conditions.

For the University students, attending scientific conferences, seminars or other events to represent the University, for collaborative or other purposes related to the University, VMU may reimburse all the expenses or part of them in accordance with VMU Description of Procedure for Granting Fee Reductions and Reimbursement.

Student social support is coordinated by VMU Student Affairs Department that manages students' accommodation at the University dormitories, administrates student social and motivational scholarships, accommodation fees and release from tuition in specific cases. Accommodation service is provided for VMU students, and they have opportunities to settle in the University dormitories. Each semester based on a competitive selection process some students receive a reduction in accommodation fee (based on their social situation and the type (price) of the room) or a reduction in tuition fee (based on the average grade of the last semester (which must be no less than 8 points) and social (financial) situation or active participation in scientific, artistic, sports, civic or community activities at the University). Social scholarships are provided for students regarding their social situation, motivational scholarships are provided regarding students' academic achievements. Moreover, VMU has established patronage scholarships to support student activities, the University has also set VMU honour scholarships, Rector's nominal scholarships, scholarships by various programmes, etc. One-time scholarships for scientific or artistic achievements are awarded to the most productive students and/or the students with the highest and most significant achievements in previous calendar year in the relevant group of study fields. This scholarship is open to candidates who have at least one scientific publication, a conference presentation, or a public presentation of their work. During the period under review, 7 students studying Civil Engineering benefited from reduced tuition fees.

VMU Student Representative Council also takes care for student social support. It represents students' interests and enhances their cultural and social activities.

Upon the need, students can receive free-of-charge counselling of a psychologist at VMU Psychology Clinics in individual meetings or online. The Academic Chaplaincy takes care of the students' spiritual needs, the University provides conditions for spiritual support for representatives of various religions.

Students with disabilities are consulted and assisted by a disability coordinator in dealing with various issues related to their studies and environment. Upon the need, a disability coordinator also advises students on disability etiquette, conducts other educational activities.
Students are supported in modelling their career plans. VMU Career Centre of Student Affairs Department regularly organizes seminars and provides consultations on career planning issues. Regularly, at least once a year, face-to-face meetings with the Faculty, Academy Alumni members are organized, where graduates introduce their work experience, relevance of acquired knowledge and skills. The University and the Faculty, Academy have cooperation agreements with different social partners, including commitments to inform students about job positions. Announcements for open job positions, places of practice and volunteering are posted on the Faculty, Academy and Career Centre websites.
Other support opportunities: support for the activities of student organisations is provided through project competitions; there are individual consultations given due to the studies choices, their continuation. All the measures are intended to create favourable study conditions and reduce the number of drop-out students, ensuring the quality of studies.

3.5. Evaluation of the sufficiency of study information and student counselling

Information about various activities related to the study process is delivered to the students by various means. Personal consultations are conducted in contact, by e-mail or phone, virtual meetings are organized in response to students' questions. For potential students of master studies, an "Information week" is organized to acquaint them with the master studies and opportunities to choose a specific study programme as well as to introduce them with the administration of the faculty, chairmen of study programmes.
Students can receive more information about the study programme on VMU website. They also have an opportunity to get acquainted with full descriptions of study courses of the chosen study programme or an optional / alternative study courses via *Moodle* platform. Study course descriptions include the information of the aim and expected learning outcomes of the study course as well as their coherence with topics, study and assessment methods. The system of evaluation, basic and additional literature are also presented in the course descriptions.
In order to provide students with timely information about studies, they receive personalized emails. Students use a specially designed student portal where they can receive informational messages. The University has a centralized Student Centre to support them by direct contacts or calling, emailing or contacting through social media. In Facebook social network a special account for VMU students has been created, which publishes relevant information for students. General information and news are also posted on VMU website.
The most valuable support for students in the field of civil engineering is provided by the staff of the Department of Water Engineering, which supervises the programme. Close, warm communication between students and teachers is maintained, and after lectures teachers gladly discuss with students not only the questions about the study course, but also about the study process or personal issues. Meetings between the study coordinator, the head of the programme committee and the dean are held regularly once a semester or upon the need, during which the issues of study organization, the study courses of the study programme, the challenges of the teaching and learning or any other questions relevant to students are discussed. The search for joint solutions is continuous and helps to meet the need for quality studies. The timing of the lectures and consultations is published on the faculty web-site. A full-time teacher devotes 20 academic hours per semester to counseling. We believe that due to the application of all these measures, information about studies and student counseling in the field is sufficient.

Expert recommendations provided during the last external evaluation related to *Student admission and support*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*Critically review admission requirements.*	*From 2022, the VMU rules for admission to Master's studies apply, which provide that graduates of university bachelor's degree programmes in other fields of study groups who have completed less than 60 credits of subjects in Group C of the Engineering programme will be offered additional subjects after an assessment of their eligibility to study in the Master's programme.*
2.	*Periodically review the (no-) need for admission to full-time studies.*	*From 2022, first-year students are asked after the first semester whether they would choose to study full-time. 20 students took part in the surveys and 3 out of 20 respondents indicated that they would have chosen full-time study. The remaining students opted for part-time studies. These survey results indicate that full-time studies are not in high demand amongst the enrolments.*
3.	*Work proactively on short-term mobility opportunities for secondcycle students.*	*The University is continuously expanding mobility opportunities, with periodic presentations to students of the Programme. The focus goes not only for the classic long-term mobility programmes but also for short-term mobility. During the reporting period, five times students participated in mobility programmes and short-term placements.*

Please provide main results of the self-evaluation in the area of *Student admission and support*

Strengths

1. The second cycle study programme is designed to prepare professionals for a well-developed labour market, which makes it attractive for those choosing a field of study and professional activity. Clear and appropriate admission criteria make it possible for college graduates to enter the programme (due to supplementary studies), and the number of first-year students is stable year after year.
2. The programme is increasingly chosen by students who are better prepared, have a strong academic background, effective learning skills and are well prepared for academic challenges. This is reflected in the steadily rising competition scores of applicants.
3. An adequate and effective support system for students, involving everyone from the teacher to the administration and management staff, enables students to receive all the necessary academic, social, financial and psychological support in a quick and efficient way, increasing their satisfaction, motivation and chances of success in completing their studies.

Areas for improvement*

1. Second cycle students do not choose long-term mobility programmes for objective reasons (integration into the labour market during their studies). Therefore, second cycle students should continue to be encouraged to take up at least short-term (one-week) mobility programmes, either through contact or distance learning.

4. STUDYING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

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

The second cycle studies in the field of civil engineering are carried out in a part-time study form. The second cycle programme is carried out by organizing the study process on the principle of intensive contact work. This method of study was chosen taking into account the students' desire to combine studies with work activities. Auditory work is organized in training sessions, which take place twice a semester for two to three weeks at the time provided in the study schedules. The study method of intensive contact work influences the relationship between auditory and independent student work, the nature of real and virtual/remote communication between students and teachers.

The University provides good opportunities for distance studies. During the implementation of these studies, *VMU Office 365 Teams, BigBlueButton* video conference tools are applied for the organisation of teachers' work with students. Instructions on how to use the mentioned tools and what are their possibilities are described by VMU Innovative Studies Institute (ISI) in the User Guides for the organisation, implementation and evaluation of distance learning. For teachers, there are also developed and constantly updated a support system and methodological recommendations on how to adapt the course to distance studies, prepare it for online learning, etc. Teachers are also consulted by e-mail by filling in the request form.

Based on the most common student questions (for example, how to join study courses and video conferences in the *Moodle*, how to adjust computer settings or how to solve technical problems that occur during assessment in study courses), a distance learning environment user guide has been prepared for students. For each study course in the *Moodle* environment, teachers indicate how to connect to the chosen video conference tool, provide requirements for the participation in study classes.

The methods of second cycle studies (teaching and studying) and assessment applied during the study are also presented in the descriptions of study courses. Different study methods are selected in different forms of study courses.

Study methods are often used in the lecture - interpretation, illustration of examples, analysis of scientific sources and special literature, review of videos, discussion, summary of information, etc. (e.g. Design of Hydraulic Structures, Urban Water Management, Building Legal Regulation; Reliability of Hydraulic Structures, etc.); study methods used in seminars - analysis of problematic examples and questions, performance and summary of tasks, consulting, analysis of problematic cases, expression of competent opinion, discussion (e.g. Building Legal Regulation, Decision Support Systems in Water Engineering, Restoration of Damaged Aquatic Ecosystems, etc.); study methods used in practical and laboratory works - design and case analysis, interpretation of tasks, consulting, application of special computer software packages, analysis and solution of problem tasks, etc. (e.g. Environmental Structures, Building Information Modelling (BIM), Optimization of Water Supply and Sewer Systems, etc.).

The most commonly used assessment methods in second cycle are written survey, discussion monitoring, observation of practical tasks, assessment of completed tasks, assessment of report/case analysis, assessment of problem analysis, discussion monitoring, monitoring and assessment of individual work presentation, expression of competent opinion, knowledge assessment test, etc. Assessment methods are chosen according to the specifics of the individual course, the intended learning outcomes and the course's study methods. For example, the assessment methods for the study subject Restoration of Damaged Aquatic Ecosystems are as follows: assessment of problem case studies; assessment of analysis of practical assignments, assessment of analysis of completed practical assignments, presentation of projects; the assessment methods for the study subject Urban Water Management are as follows: interpretation; discussion; performance of practical tasks; preparation and presentation of practical work, etc.

Hours for students' independent work are provided in the study course description. At the beginning of the semester, each teacher introduces the students to the workflow plan, and consults them during the semester (by e-mail, in the Moodle environment, contact consultations). Independent learning in the programme consists of students' preparation for laboratory and practical work, seminars, discussions, individual tasks and their presentation, reading and analysing the literature referred to, for preparing individual and team work, and for writing essays.
Independent work is a way of supplementing and extending the knowledge acquired in lectures, laboratory work and exercises. The student acquires the ability to independently use teaching tools and to apply modern information technologies and computer programmes, to analyse the material independently, to critically evaluate it and to draw conclusions. In order to achieve the result, consistent work during the semester is encouraged and monitored through feedback. Students' independent work is assessed by the subject teacher and the assessment is included in the cumulative grade.
The study programmes are flexible in their teaching methods, encouraging maximum learner engagement and active participation in the learning process. The methods of performance assessment are chosen in such a way that in all cases the student understands the objectivity of the assessment.
The accumulative system for the assessment of learning achievements is applied in the University. Students' learning achievements are assessed in midterms, another intermediate work and examination or defence of students' projects. The final mark integrates the intermediate work assessment and examination marks. The examination mark makes 30-60% of the final mark. The structure of the accumulative system is presented in the description of each study course. For example: subject - Design of Hydraulic Structures cumulative mark structure: laboratory works - 30 %, group work and team assignments (case studies, project preparation and presentation) - 10 %; midterm test - 20 %; exam - 40 %; Structure of the score for Optimization of Water Supply and Sewer Systems: practical works and team assignments (case studies, project preparation and presentation) - 20 %; seminars - 15 %; midterm test - 15 %; exam - 50 %. Examinations and midterm tests can be conducted in writing or orally, depending on the specifics of the study course, but their tasks must be the same or equivalent for all examinees. Intermediate work and final work assessments (examinations, midterm tests) may be organised in distance following Description of Procedure for Organisation of Online and Blended Studies at VMU approved by the Rector.
Graduates can work as researchers and teachers in scientific and educational institutions of water engineering, and they can continue their studies at the doctoral level in the field of technological sciences.

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

Disability Policy of VMU: "University of Inclusive Opportunities" was presented and approved by VMU Senate in 2021. The document is focused on increasing the accessibility of studies and work by properly adapting study and working conditions for VMU community members with disabilities. The document aims to ensure a sustainable disability action plan focused on the students and staff of the University. The aim is to improve the opportunities for persons with disabilities to acquire higher education, to find employment in higher education institutions and to ensure accessible study or working conditions for them.
Socially vulnerable groups and students with special needs are given the opportunity to study according to an individual study schedule. Studies according to the individual study schedule are regulated by Description of Procedure for Submission of an Individual Study Schedule at VMU.
Students with special needs are guided remotely, if necessary, using modern video tools, and learning materials are hosted in a virtual environment. There were no students with an individual study plan during the evaluation period.
Socially vulnerable groups (orphans, people with disabilities, students from large families, families receiving social benefits and low-income families) receive various discounts for tuition or dormitory

fees, scholarships are provided for these students. There were no students from socially vulnerable groups in the 2021-2024 period.
Students with disabilities are advised on a variety of issues by a disability coordinator. These students are allowed to park their cars near the University buildings, access to the buildings is maintained; the necessary equipment is established for the disabled in libraries, classrooms are set with suitable furniture, students can settle in specially adapted dormitory rooms, if necessary, with an accompanying person. The study process is organized according to individual needs of students, individual counselling is provided when necessary, data on students with disabilities are integrated into database systems, thus facilitating the learning process for students with disabilities. Disability educational campaigns and events are organized at the University.

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

The monitoring of student learning progress is regulated by VMU Study Regulations and the Description of Procedure for Monitoring Study Process and Providing Assistance to Students at VMU.
Monitoring of learning progress is carried out in the following ways and stages: 1. The analysis of first year students' preparation for studies. 2. The analysis of students' registration to study courses. 3. The analysis of the reasons for the students' non-participation in interim and final examinations. 4. The analysis of students' intermediate and final evaluations. 5. The analysis of the data obtained from periodic surveys conducted at the University. 6. The monitoring of students' learning progress, social integration and study experiences.
Monitoring of student achievement begins each semester when a student registers for a study or study course. Discussions of learning outcomes help students track study progress.
The University departments perform monitoring of learning achievements regularly. The monitoring of student achievement and provision of assistance in the analysed field of study is ensured by the Faculty of Engineering, which is responsible for monitoring the enrolment of students in the Faculty, informing students for the purpose of preventing drop-out, organizing teacher consultations, student-mentors willing to volunteer their help to students facing difficulties during their studies, monitoring and analysing the achievement of students, and improving the study activities. These activities are carried out by the Study Administrator at the Faculty. Students' achievements are monitored during the semester by the teachers, and if they notice any difficulties, they offer them additional counselling or other assistance; if they notice non-attendance of lectures or reports, they inform the administrator, who contacts the students, explains the reasons for this, and offers assistance.
For those who do not attend the midterm or final settlement for serious and justified reasons, they are offered a postponement of the settlement to a later date and academic leave. There is also the possibility to retake a colloquium or examination that has been marked negatively once, free of charge.
Students themselves are invited to make self-monitoring of their progress in studies and follow the processes of studies: to register for studies, to amend their study plans, to observe evaluations of their own learning and make improvements, to get acquainted with results of surveys for quality improvements, etc.
Monitoring of students' study progress is carried out through the study information system *Studis*, as well as through the distance learning system Moodle (course teachers regularly fill in the course progress bar),
The results of the monitoring are used to analyse and eliminate in a timely way the reasons for failure to study, underperformance and lack of attendance, and discussions are held with the dean teacher and the students on how to help the students and thus improve the quality of their studies. In the event of a student falling behind on assessment plans, an individual assessment schedule is drawn up by mutual agreement, but these cases are exceptional, for justifiable reasons, such as illness or the like. Student achievement is checked consistently during each semester, defending practical, laboratory work, and other assignments. At the end of the semester, a course exam is held. The correspondence of the student's knowledge and abilities to the results of the study course is checked. The University applies

a cumulative score criterion system of assessment of study achievements, using a ten-point scale. The cumulative assessment system motivates students to progress not only during the exam session, but consistently throughout the semester.
After evaluating the data collected while monitoring students' study progress, improvement of study organization and study quality, promotion of academic engagement, assurance of social integration and implementation of preventive measures to manage students' underachievement are carried out. Academic, social integration, financial and psychological support is provided.
Feedback for students is provided systematically – after the mid-term examinations and the exams students are acquainted with the assessment results and comments on how good they have performed the tasks. The results of intermediate work assessment are announced and discussed during lectures within the period of 2 weeks. After the written examination, the final results are announced on the University intranet within the period of three working days and afterwards they are discussed in the student group.
Although part-time students are engaged in professional activities, the average progress of part-time students is quite high at 8.30 points. Higher grades are observed in the second and third years. It can be concluded that students do not lose interest and motivation throughout their studies and do not doubt their choice.
Students in the field of study are continuously monitored and kept well informed of their academic progress.

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

Collaboration with VMU alumni takes place mainly through alumni clubs and individual departments of the University. Graduates periodically receive newsletters with current information, they are advised by an alumni coordinator on cultural and educational activities.
The University has an active VMU Alumni Club which main aim is to unite VMU alumni and maintain close relations with the University. Every year members of the club attend the University events organized to develop students' professional and employability skills as well as get acquainted with career opportunities. Alumni Club members also organize club meetings, various events (lectures, discussions, informal meetings, field trips, excursions to various companies employing university alumni, etc.), actively participate as consultants and experts in study programme committees, study quality assessment groups. Each year, with the help of the University, the club organizes VMU Alumni Day in order to bring together VMU alumni.
Newsletters about the university and its activities are periodically sent to the graduates, they are invited to various events to share their experiences, insights and so on. VMU has joined the career mentoring platform *idialogue*, where VMU graduates are invited to register and become career mentors.
VMU Academy of Agriculture has their alumni club, which main activities are representation of VMU Academy of Agriculture to students and members of agrobusiness; promotion of partnership between VMU Academy of Agriculture and alumni by establishing new regional and professional departments; participation in student events; assisting students in planning their careers and employment.
In order to ensure the quality of studies and provide career planning service that meets the needs of the students, the University monitors the employment and career of VMU graduates. The main sources of information are the alumni survey conducted by VMU, statistics provided by the Employment Service and information provided by the Government Strategic Analysis Centre.
Each year VMU Career Centre performs an online survey for alumni, one year after their graduation. The focus of attention is their current work situation and satisfaction with the studies they have graduated. Those graduates, who are not working, are asked if they have work experience and if they are looking for a job. All graduates (employed and unemployed) are requested to give their opinion on how much they are satisfied with their current career situation and what has been most useful while preparing for their career at the University. Alumni are also asked to evaluate VMU's contribution to their preparation for labour market. Summarized survey results are published on the University

website and on the Career Centre website. A more comprehensive analysis of the survey data is available on the University intranet: Outlook Public Folders → Career Monitoring.
On the basis of the cooperation agreement with the Employment Service, signed on the 6th of November in 2019, VMU gets the statistical information about VMU graduates registered for a job search. Information is provided twice per year, i. e. 12 months and 15 months after their graduation.
Data from the 2021 and 2022 surveys of graduates of the Hydraulic Engineering degree programme 12 months after graduation are not evaluated as the response rate was very low, only 5.00% (N=1).
The National Agency for Education system of Education Management Information (NAE EMI) employment data for graduates 12 months after graduation for the years 2020-2021 and 2021-2022 are shown in Table 4.1.

Table 4.1. National Agency for Education system of Education Management Information (NAE EMI) employment data for graduates of the *Hydraulic Engineering* study programme 12 months after graduation.

Work activities	2020-2021 m. N=16 (18 graduates)	2021-2022 m. N=11 (13 graduates)
Total number of employed	88.9%	84.6%
Highly qualified work	62.5%	63.6%
In military service	0%	7.7 %
Not in employment	11.1%	7.7%
Of the unemployed, foreigners	0%	7.7%

Table 4.1 shows that the majority of graduates are employed: 88.9% in 2020-2021 and 84.6% in 2021-2022. 62.5% of graduates were employed in highly qualified jobs in 2020-2021 and 63.6% in 2021-2022. Graduates are employed in companies such as JSC Kelprojektas, JSC ViaconBaltic, and in district Agriculture and Estate Management departments.
The high graduate employment rate shows that there is a market demand for graduates in this field.
Table 4.2 provides information on the evaluation of the contribution of VMU to labour market readiness of final year students in the field of analysis, based on a survey of graduating students (EXIT survey).

Table 4.2. Survey data from the 2021-2023 graduating students of the *Hydraulic Engineering* (EXIT) study programme on how respondents rate the contribution of the VMU to their professional preparation (*Rating scale: 4 - good, 3 - more good, 2 - more bad, 1 - bad, 0 - don't know, hard to say*)

How do you rate the contribution of VMU to your professional preparation?	2021 -2022 m. (N=9) (EXIT)	2022 -2023 m. (N=10) (EXIT)
Don't know, hard to say	22.2%	20.0%
Bad	0%	10.0%
More bad	0%	10.0%
More good	44.4	10.0%
Good	33.3%	50.0%

The survey data shows that 33.3% and 50.0% of students graduating from the Hydraulic Engineering study programme in 2021-2022 and 2022-2023, respectively, rated the contribution of VMU to the preparation for professional activities as "Good".
12 months after graduation, 2 graduates took part in the survey in 2021-2022 - too small a size and therefore not evaluated. Monitoring data for 2022-2023 are not yet available.
Data from the 2021-2023 Graduating Students (EXIT) surveys on what was most useful in preparing for a career are presented in Table 4.3. The 2021-2023 graduates consider the knowledge and skills

acquired during their studies and the knowledge and skills acquired through independent tasks to be the most useful for preparing for the labour market.

Table 4.3. Data from the 2020-2022 Graduating Students (EXIT) surveys on what was most useful in preparing for the labour market.

What has been the most useful part of your professional preparation?	2021 -2022 m. (N=9) (EXIT)	2022 -2023 m. (N=10) (EXIT)
Knowledge and skills acquired through lectures, seminars, laboratory work and other study activities	100.0%	70.0%
Knowledge and skills acquired through independent tasks	33.3%	40.0%
Knowledge and skills acquired during a study practice	22.2%	40.0%
Experience gained through international studies or traineeships (e.g. Erasmus studies, Erasmus traineeships, exchange studies, etc.)	0.0%	20.0%
Knowledge and skills acquired in other (non-study or international) traineeships (additional, voluntary or other types of traineeships)	0.0%	50.0%
Voluntary activities	0.0%	20.0%
Activities in university student organisations	0.0%	0.0%
Support from the University administration (dean's office, departments, Career Centre, etc.)	0.0%	10.0%
Teachers support	22.2%	10.0%

An analysis of the National Agency for Education system of Education Management Information (NAE EMI) data on graduate surveys reveals that the majority of graduates have a professional activity that is in line with the specialty they have acquired, or close to an engineering specialty.
Each year, the Faculty administration receives more than 10 job offers for graduates. The information on job offers is hosted on the Faculty's Notice board.

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

The principles of integrity are defined in Statute of VMU, Code of Ethics of VMU, VMU Provisions on Prevention of Plagiarism in Student Written Works, VMU Study Regulations. Non-discrimination measures are regulated by Code of Ethics of VMU. VMU Gender Equality Plan for 2021-2025 outlines the activities and measures planned to promote cultural and systematic change in University at both institutional and department level in order to maintain a balance of gender.
In the case of dishonest student behaviour, observed during the final examination or other assessment, teachers discontinue the student's performance and inform about this the Dean of the Faculty, Academy Chancellor and the Department of Studies in written form. The final evaluation "0" (zero) is written in the learning outcome record book. The faculty dean, Chancellor of the academy starts the investigation regarding students' unfair behaviour.

VMU Provisions on Prevention of Plagiarism in Student Written Works identify types of plagiarism, methods of determining the plagiarism and consideration procedures, as well as recommendations for

teachers and students on how to prevent plagiarism in written works. Both teachers and students have the right to appeal to the University's Academic Ethics Commission, which makes final decisions on academic integrity.
Plagiarism prevention is carried out in the field of study: students are introduced to the principles of honest study at the beginning of their studies, and teachers of each subject remind students of the rules of honest academic behaviour before exams. Teachers of written assignments, research papers and final theses provide rules on how to do written work, how to cite, how to use the information gathered, etc. Preventive measures help to avoid cases of dishonesty in reports and plagiarism in essays, research papers and theses.
There have been no cases of violation of the principles of academic integrity, tolerance and non-discrimination in the analysed field of study in the last 3 years.

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.

Appeals and complaints regarding the study process were regulated by VMU Regulations for Submission of Appeals Regarding Evaluation of Learning Outcomes and/or Assessment Procedure until 2023, and currently these issues are solved according to VMU Regulations of the Dispute Resolution Commissions of VMU; the mentioned issues have also been determined by VMU Provisions on Prevention of Plagiarism in Student Written Works and VMU Study Regulations. Students have the right to submit an appeal regarding the assessment of learning achievements and the violation of assessment procedures. After examining the appeal, the commission may take the following decisions: to uphold the appeal and change the evaluation of the learning outcomes; to uphold the appeal (in whole or in part) but not to change the evaluation of the learning outcomes if violations found do not affect the evaluation; if violations related to the assessment procedure are detected, to allow the appellant to retake the test/examination; to dismiss the appeal; if, during the examination of the appeal, possible violations are identified that are not within the scope of the appeal and/or the competence of the commission, the commission informs the relevant members of the administrative staff of these circumstances.
There were no appeals or complaints and no cases of exclusions from examinations due to dishonesty in the field of study during the analysis period.

Expert recommendations provided during the last external evaluation related to *Studying, student performance and graduate employment*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*Upgrading the system for Quality Assurance through developing a Quality Handbook, as well as taking measures on the basis of the results obtained during the survey.*	*On 25 May 2022, the University Senate approved the updated VMU Quality Manual, which is available on the VMU website and in the VMU Outlook folders. The analysis of the results of the Exit Survey (2021-2023) shows that about 78% of students have a positive opinion about the quality of their study programme. The results of the Teaching-Studying Survey also show a positive attitude of students towards the work done by teachers. The students who took part in the surveys suggested that some teachers should organise their teaching better, involve students more actively in their studies, and present content more clearly. Following these suggestions, specific factors for improving the quality of studies were discussed with individual teachers.*
2.	*The University has to imbed the national statistical data into the*	*The University uses national statistics to monitor and evaluate graduate employability. Data provided by the Employment Service (published in the University's annual report, strategic*

	process of analysing and reaching decisions about graduates' employability, evaluation and tracking the graduate's career.	*aggregates from the Department of Student Affairs, U-Multirank international rankings, etc.) are used to monitor employability. For the self-assessment of the programmes, graduate data from the National Agency for Education database are used from 2023 onwards (previously STRATA data were used). Graduate employment data are used to assess the University's strategic indicators, the graduate employment rate and the post-graduation career situation of graduates (data are cross-sectioned according to job classification (high/low-skilled, unskilled, self-employed).*

Please provide main results of the self-evaluation in the area of *Studying, student performance and graduate employment*
Strengths
1. In the field, various teaching and student achievement assessment methods are applied, which are appropriately combined with each other, encouraging students to actively participate in the study process. 2. The program has an effective study progress monitoring system that helps students achieve good academic results and reduces the risk of student dropout. 3. The program successfully prepares graduates for qualified work. The employment rate of program graduates is high, and graduates rate their professional preparedness and competence highly. Vytautas Magnus University provides excellent conditions for the studies and integration of representatives of socially vulnerable groups and students with special needs. 4. The VMU documents clearly regulate the course of studies, the reporting procedure, and the prevention of plagiarism to ensure a smooth and efficient study process.
Areas for improvement*
1. Gathering employers' opinions on graduates' professional training, aiming at a more active participation of graduates in graduate surveys

5. TEACHING STAFF

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

The study program is delivered by the Department of Water Engineering at the Faculty of Engineering, which has extensive experience in organizing studies at all levels (bachelor's, master's, and doctoral) as well as coordinating teaching and research activities. Successfully collaborating with other faculty and university departments, as well as social partners, the department has assembled a highly qualified team of staff capable of teaching theoretical and practical interdisciplinary subjects. Therefore, all subjects are taught by teachers with significant experience in their respective fields. All teachers in the study program hold positions as teachers or as both teachers and researchers.

The duration of teachers' working time and the principles of planning and calculating teachers' workload structure, their implementation and monitoring is determined by the Description of the Procedure for Calculating VMU Teachers' Workload, approved by the Rector in 2024 May 27 by Order No. 222. The average workload of a teacher (when working full-time) is 1584 hours per year, 36 hours per week. The workload of the teacher consists of the following activities: contact work with students, non-contact work (preparation for teaching), carrying out research and experimental development, competence development and organisational activities.

Taking into account the positions of teachers according to the fields of science, the hours of contact work with students are determined on the basis of normative workloads (for 1 full-time position): in

the fields of engineering – no less than 450 hours for a professor, no less than 500 hours for an associate professor, no less than 525 hours for an assistant, and no less than 575 contact hours per year for a teacher.
The structure of working time is fixed in the annual individual work tasks of teachers. One third of the teacher's workload is devoted to teaching, another third is recommended for science, and another for methodological and organizational work. Teachers provide information on the results of their work in annual activity reports, which are monitored by the Department of Science and Innovation. The results are discussed with the head of the department. The University has developed a system of financial incentives for teachers through salary supplements, the amount of which depends on the results achieved. Scientific activities, in particular the publication of high-level articles, are most encouraged. All teachers' scientific publications and other scientific production are placed in the database of the University Library. At the end of each year, teachers declare the results of other scientific, art and organizational activities by submitting individual activity reports. This information is monitored by the VMU Department of Science and Innovation. The teacher's activities and results in the field of professional development are evaluated every five years during the attestation. Qualification requirements for VMU teachers and researchers, the procedure for attestation and organisation of the competition as well as other relevant documents are available on the University website.
Teachers are highly qualified, carry out international and national research projects, publish their research results in high-level international journals, and systematically improve their qualifications through internships abroad. Detailed information on the teaching staff is given in Annex 3. They are recognised in professional and scientific communities, participate in professional development programmes, internships and international academic mobility programmes.
The composition of the teaching staff meets the requirements outlined in the General Study Implementation Requirements and the Description of the Engineering Sciences Study Field Group (Table 5.1). All program teachers hold at least a master's degree or an equivalent higher education qualification. In the program, 15 teachers deliver lectures and conduct practical sessions for study subjects (including all elective subjects), of whom 3 are professors, 8 are associate professors, and 3 are teachers with a master's degree. 80.0 % of the subjects are taught by teachers with a doctoral degree, while the remaining 20.0% are taught by teachers with a master's degree. Professors teach 20.0 % of the subjects in the program's study field.
All teachers have practical experience. The average practical work experience of teachers currently working in the programme is 21.3 years. This experience is most often gained through freelance contracts or individual activity certificates while engaging in project-based or expert activities.
There has been little change in the number of teachers in the programme over the last 3 years. Two teachers have left for other jobs and one teacher is retired in 2022. Teacher interchangeability is addressed by assigning the subject they teach to younger teachers who take over the teaching of subjects.
Teachers have been working at the university for between 5 and 40 years. The qualification composition of the staff is shown in Table 5.1.

Table 5.1. Compliance of the field staff with the requirements for the second cycle studies

Criteria	Requirements	In the programme
At least a master's (or equivalent) degree:	Not less than 100%	100%
Master's degree (or equivalent) in Civil Engineering	Not less than 50%	100%
Taught by scientists with dr. degree Of these, scientific activities correspond to the courses taught	Not less than 80% Not less than 60%	80% 80%
Taught by professors	Not less than 20%	20%

Information about all teachers in the programme can be found in the open ORCID system, which has direct interfaces with the VMU's open science management system CRIS.

According to the description of the Engineering Study Field Group, researchers teaching second-cycle university studies who hold a master's or doctoral degree must conduct research in the relevant field of engineering, publish their results in scientific journals, and participate in national and international scientific events. In the case of state-regulated professions, teachers must have relevant professional experience related to the subject they teach. The qualifications of the teachers are sufficient to achieve the intended learning outcomes of the program. The study program is delivered by highly qualified teachers, most of whom are internationally recognized researchers. Approximately 75% of the teachers' research activities align with the subjects they teach. This ensures their high competence in the field and their ability to identify and solve hydraulic engineering problems on a global scale.
The high competence of teachers is ensured by the qualification requirements that must be met in order to hold the position of associate professor or professor. The suitability of the academic and research staff's qualifications (scientific, didactic, and professional competences) for the position and to achieve the learning outcomes is determined either during the hiring process or through periodic evaluations (every five years). This is based on the 'Description of Minimum Qualification Requirements for Teachers and Researchers in the Fields of Natural, Technological, and Agricultural Sciences at Vytautas Magnus University,' approved by the VMU Senate on February 28, 2024, Resolution No. SEN-N-6, as well as the Description of Required Competences for Career Stages of Researchers at Research and Study Institutions.
The high qualifications of the programme's teachers are recognised worldwide. Academician, Prof. (HP) Dr. A.Povilaitis is the Lithuanian representative delegated by the Ministry of Education, Science and Sport of the Republic of Lithuania to the EU Programme Committee (Programme: European Partnership under Horizon Europe WATER4ALL - Water Security for the Planet) and an expert of the International Commission of the UNESCO and the L'Oreal Baltic Foundation "For Women in Science", a member of the Committee of the UNESCO National Committee on "Man and the Biosphere". Prof. (HP) Dr. P.Punys is an expert of ETIP (European Technology and Innovation Platform) and EREF (European Renewable Energies Federation), and Assoc. Prof. Dr. E. Kasiulis is a member of the ETIP Hydropower General Assembly. Prof. Dr. A. Radzevičius is an honorary member of the Nordic Federation of Agricultural Science (NJF).
The scientific competence of the teachers allows them to successfully participate in the activities of Lithuanian and international organisations. Five teachers are members of the following institutional councils: the Council of Water Problems of the Lithuanian Academy of Sciences, UNESCO IHP (International hydrology programme), IAHS (International Association of Hydrological Sciences), NHF (Nordic Association for Hydrology).
Three teachers are members of the Technical Committees of the Lithuanian Standardization Department TC 19 "Concrete and Reinforced Concrete" (Assoc. Prof. Dr. V.Gurskis and Assoc. Prof. Dr. R.Skominas) and TC 96 "Energy Efficiency of Buildings" (Assoc. Prof. Dr. R.Šadzevičius). Two teachers (Prof. Dr. A.Radzevičius and Assoc. Prof. Dr. R.Šadzevičius) are members of the Professional Committee "Mining, Electricity, Gas, Steam Supply and Air Conditioning, Water Supply, Wastewater Treatment, Waste Management and Regeneration". Four teachers are members of the BIM Development Working Group of the Lithuanian Construction Digitisation Process: Assoc. Prof. Dr. V. Gurskis, Assoc. Prof. Dr. R. Skominas, Assoc. Prof. Dr. R. Šadzevičius and Lect. D.Ramukevičius.
The programme's teachers are actively involved in expert and science dissemination activities: Prof. (HP) Dr. A.Povilaitis is an expert of the European Commission's Science Council's Horizon2020 Programme Project Evaluation Committee and the Lithuanian Science Council. Prof. Dr. A.Radzevičius, Assoc. Prof. Dr. R.Šadzevičius and Assoc. Prof. Dr. R.Skominas are experts in research projects of the Innovation Agency, Assoc. Prof. Dr. I. Adamonytė is the Director of the Association of Science, Studies and Business, “Valey Nemunas".
The programme's teachers are members of the editorial boards of the scientific journals "Energy", "Journal of Water Security", "Environmental Research, Engineering and Management", "Forestry and Landscape Management" and the international scientific conference "Hydrology and water - related ecosystem services (2022)", "Ecological and Environmental Engineering (2024)", "The Newest Agrotechnologies 2021", "Innovations in Minimization of Natural and Technological Risks 2021",

"Rural Development 2021, 2023", "Human and Natural Safety 2022, 2023", "Young Scientist 2022, 2023". Among the teachers of the programme is the editor of the professional journal "Land Management and Hydraulic Engineering" of the Lithuanian Association of Land Management and Hydraulic Engineers.

Teachers' qualifications can also be demonstrated by their participation in top-level international programmes such as HORIZON, LIFE, Erasmus+, COST and national and international projects (see Annex 4). 30 research and study projects have been carried out between 2021 and 2024. The most important international research projects include:

- Horizon 2020 project – HYPOSO - Hydropower solutions for developing and emerging countries, Leader Prof. (HP) Dr. P.Punys, 2019-2022.
- Horizon Europe (HORIZON CL6-2022-Zeropollution-01-02) project – NENUPHAR – New governance models to enhance nutrient pollution handling and nutrient recycling, Leader Prof. (HP) Dr. A.Povilaitis, 2023-2026.
- Horizon Europe project – PRIM-ROCK - PRocess Innovations for the Mineral industry focusing on ROasting and Calcination Kiln technologies and supported by novel pre- and post-processing, Leader Assoc. Prof. Dr. R.Skominas, 2024-2028.
- LIFE project – LIFE NEXUS - Boosting the sustainability of the urban water cycle: energy harvest in water industry using micro-hydropower technology, Leader Prof. (HP) Dr. P.Punys, 2018-2023.

Among the study projects, the following should be highlighted:

- Erasmus+ project – The Digital Blue Carrier for a Post-Carbon Future - Curriculum Innovations in Aquaculture, Team members: Assoc. Prof. Dr. G. Žibienė, Lect. A. Žibas, 2023-2025.
- Nordplus project – SuWaCo – Education for Sustainable Water Bodies and Coasts, Leader Assoc. Prof. Dr. M.Dapkienė, 2023-2024.

Teachers are invited to other universities and colleges that prepare specialists in civil engineering as chairpersons (Geotechnical Masters (Vilnius TECH), Civil Engineering Masters (Kaunas University of Technology) and members (Bachelors of Hydraulic Engineering (Kaunas Forestry and Environmental Engineering University of Applied Sciences), Bachelors of Civil Engineering (Kaunas University of Applied Engineering Sciences)) of the final thesis defence committee.

Three teachers of the programme are members of the public technical councils of Lithuanian ministries, two teachers are members of the commission "Certification of enterprises and specialists for expert examination of melioration structures and designs of melioration structures" established by the order of the Minister of Agriculture of the Republic of Lithuania, two teachers are members of the Monitoring Committee of the Lithuanian Fisheries Sector Programme 2021-2027.

The teachers of the Department represent the University in the Lithuanian Union of Scientists. All teachers of the programme are members of the Lithuanian Professional Association of Land Management and Hydraulic Engineers. Most of them give lectures at qualification training courses for heads of the main areas of construction technical activities.

At the request of the Lithuanian Association of Reclamation Companies, the department's teachers prepared construction guidelines: 'General Construction Works,' 'Hydraulic Construction Works,' 'Bridges, Viaducts, Overpasses, Shallow Tunnels, Retaining Walls, Cableways,' and 'Building Water Supply and Sewerage. Outdoor Water Supply and Sewerage. Water Treatment and Wastewater Treatment Facilities'.

The high level of practical qualification is demonstrated by the fact that 4 teachers in the program are certified as lead experts for special hydraulic structures, including reclamation structures and other engineering constructions, as well as project managers and supervisors of project execution. They have carried out expert evaluations of hydraulic, reclamation, and other engineering structures and construction projects. All teachers in the program are proficient in one or more foreign languages at a level of B2 or higher.

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)

Each VMU teacher has opportunities to use Erasmus+ programme possibilities:

1. To go for Erasmus+ teaching visits to VMU partnership universities in the EU as well as EEA/candidate countries (440 partner institutions) or outside the EU (118 partner institutions). About 260 VMU teachers accept teaching mobility possibilities in a year.
2. To go for Erasmus+ training (qualification development) visits to any institution or organisation (including other higher education institutions) in the EU as well as EEA/candidate countries or to any partnership university outside the EU. About 390 VMU staff members participate in staff mobility for training in a year.

At the University, a Science Fund has been established with the aim of promoting international mobility. The Fund organizes competitions for research projects, doctoral research trips (internships), and competitions for scientific projects within institutes (which can also be used to support trips or internships for institute members). Each year, VMU, in collaboration with other institutions in the "Santaka Valley" association, announces calls for scientific research projects, and the funds can also be used for mobility purposes. Faculty members can also participate in research trip competitions organized by the Lithuanian Research Council, the Lithuanian Council for Culture (scholarships), and other foundations. The VMU Department of Science and Innovation regularly shares information on upcoming competitions and their requirements.

At VMU, annual competitions are held for "Erasmus+" study visits aimed at professional development for faculty in events at foreign centers or for gaining study or research practice (through job shadowing and participation in activities) at higher education institutions (in accordance with the Erasmus Higher Education Charter) or at other companies and organizations.

Favorable conditions are provided for mobility to universities in other countries. The COVID-19 pandemic and quarantine-related restrictions in 2021-2022 negatively impacted faculty mobility, but the number of visits recovered after the pandemic (in the second half of 2022). During the analyzed period, there were 37 faculty visits to foreign universities (Table 5.2). The majority of these were teaching visits (25), where faculty members traveled to deliver lectures, while the remaining 12 were learning visits (internships, courses).

It is also worth mentioning that during 2021-2024, over 30 trips took place related to faculty participation in international organizations, networks, editorial boards of scientific journals, and international projects. This activity also promotes academic mobility, especially participation in international conferences and the development of new projects.

Table 5.2. Mobility of Erasmus + study programme teachers

Study year	2021-2022	2022-2023	2023-2024
Teaching and learning visits to partner countries	9	14	14
The most popular countries: Poland, France, Portugal			
Teaching and learning visits from partner countries	6	11	12
The most popular countries: Poland, Slovakia, UK			

VMU also hosts many visiting teachers from other universities each year. Teachers from abroad usually come for short teaching visits through the Erasmus+ mobility program and deliver open lectures to undergraduate and graduate students. Several visits were conducted by teachers from partner institutions involved in joint research projects. Statistics on foreign teachers' visits to the Department of Water Engineering from 2021 to 2024 are presented in Table 5.2. The total number of visits was 29.

The lectures given by foreign teachers were attended by program faculty and students. For example, in 2023, Prof. Dr. Wojciech Sas from the Warsaw University of Life Sciences-SGGW in Poland visited the university through the Erasmus program. He delivered lectures to master's students on the geotechnical and environmental assessment of construction materials.

The connections established during these visits evolve into productive collaborations. Most visiting teachers maintain ongoing cooperation with faculty members of the Hydraulic Engineering program (for instance, researchers such as S. Meneses from the Polytechnic Institute of Coimbra (Portugal), A. Lagzdinš from the Latvian University of Life Sciences and Technologies (Latvia), Ž. Gruden from the University of Ljubljana (Slovenia), and W. Sas and A. Gluchowski from the Warsaw University of Life Sciences (Poland)).
Both outgoing and incoming visits add significant value, as they enable the maintenance and development of professional networks, the discussion and strengthening of inter-institutional collaboration, the advancement of research cooperation, and the preparation of joint projects, among other benefits. For example, during a visit by faculty from the University of Silesia in Poland, the idea arose to develop the project "Stronger Together – Strategic partnerships of the University of Silesia in Katowice within the Transform4Europe network". Project partners include the University of Silesia in Katowice (Poland), and the University of Trieste (Italy). One of the project's objectives is to assess the ecological and biodiversity aspects of the Nemunas River.

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

Professional development activities of teachers at the University are regulated by Description of Procedure for Professional Development of Academic and Non-academic Staff at VMU. At VMU, teacher professional development is organised under 3 groups of competences: general (foreign language, intercultural communication and cooperation, management, etc.), professional (didactic, digital, research, subject-related, etc.), personal (personal development, time management, etc.) competences. At least 20 academic hours are recommended for teacher professional development per year.
VMU Professional Competence Development Centre in cooperation with other units elaborates the professional development system at the University that meets the expectations and needs of the employees. Professional development includes teacher involvement in the University-provided courses as well as the ones organised by other Lithuanian or international institutions through contact and distance participation. The University-provided possibilities for professional development are free of charge for VMU teachers, about 8 trainings are held per month, while January is the month of professional development for the VMU community, then on average about 40 trainings are offered. Teachers also choose professional development possibilities outside the University regarding their teaching and research interests. If other institution-provided possibilities are cost-related, the University teachers can apply for support from their department, research clusters, Erasmus+ programme possibilities or use other potential opportunities. In response to the need of VMU academic and non-academic staff to receive funding for the chosen seminars, trainings or courses, the VMU Professional Development Fund was established in 2022. In 2023 the Fund financed 15 teachers' applications for competence development.
In recent years, the development of the University teachers' didactic skills has been focused on the training covering more active students' involvement in studies and research, application of innovative teaching and learning methods, distance teaching and learning, providing effective feedback to students and evaluating learning achievements, updating the content and improving the quality of studies. Other relevant trainings are also organised.
The University teachers get actively involved in the trainings conducted by VMU Institute of Innovative Studies. The topics of these trainings focus on the organization of online teaching and learning, cooperation and assessment tools in distance studies, responsible use of technology, etc. Teachers choose topics according to their respective digital abilities – from beginners, who are introduced to the main possibilities and functions provided by technology, to high-skilled teachers, who get acquainted to more complex solutions, technology selection criteria. Teachers are also actively consulted on the organisation of distance learning: on the distance learning environment, video lectures and individual topics for target groups.

Teachers are also interested in the trainings by VMU Institute of Foreign Languages for the development of teachers' English language skills. Topics offered to University teachers range from „English Verb Tenses" to „Writing Academic Argumentative Essay" or „Academic Debates", „Academic Talk: Negotiations" and „Effective Reading of Academic Text". In 2023 the Institute of Foreign Languages offered the novelty named "Language HUB" – weekly informal conversations in a foreign language on the topics relevant for academic and non-academic university employees.
33.06 % of University teachers participated in professional development activities in 2022 and 34.9 % of teachers in 2023.
At the university, trainings are also carried out according to project activities, in cooperation with various partners. Professional development of staff is one of the priority areas of the joint initiatives of the European University Alliance „Transform4Europe" (T4EU) and VMU. „Transform4Europe" partners have developed guidelines for the application of innovative study methods and the professional development of teachers and non-academic staff in 2021. In 2022 the concept of the T4EU professional development academy has already been introduced into practice by organizing distance international trainings-seminars: the first 20 T4EU European University distance professional development trainings for academic and/or non-academic staff were organized; VMU also organized the first T4EU innovative teaching awards; during "T4EU Mobility Week" lectures and classes for students and doctoral students, joint research projects, professional development trainings, seminars, excursions, art events and other meetings were organized; and the first T4EU International Conference-Hackathon for the Innovative Teaching and Learning Methods, held at VMU, encouraged the exchange of ideas about innovative teaching and learning methods in higher education, combining the capabilities of all T4EU alliance partners. In 2023 VMU teachers participated in 20 T4EU alliance trainings. The following topics were offered to them: "Digital storytelling", "Promoting scientific reasoning and epistemological attitude through research-based teaching", "Teaching of multilingual groups". In the trainings carried out within the framework of the project "Strengthening the international competitiveness of VMU in the Transform4Europe alliance of European universities", VMU teachers studied the following topics: "Management of scientific research data", "Development and management of commercialized research-based projects", "Application of the latest innovative methods and tools through in-depth students' inclusion", etc.
In 2023 while implementing the "Digital Transformation of Education ("EdTech")" project, University teachers participated in an intensive digital competence development program and applied the acquired knowledge digitizing study courses and practical tasks. 86 VMU teachers completed extensive training of 66 hours on the topic "Improving the digital transformation competencies of teachers in higher education institutions". Several topics of these trainings: "Co-production: student is the creator of studies content", "Challenges of artificial intelligence for education", "Creating video content: basic principles of editing. Tips & tricks", "Engaging tools and artificial intelligence technologies in education", "Capabilities and application of the graphic design platform "Canva" in teacher's daily work" etc. In the second phase of the project, teachers created 102 digital learning tools: virtual teacher's offices and simulation companies, practice of artificial intelligence tools, escape rooms and other unique and innovative tasks.
In 2023 VMU signed a cooperation agreement with Coursera, the leader in distance learning platforms. University employees who join the platform can independently expand their professional knowledge and develop various competencies for free, and teachers can enrich the content of their study courses with new and relevant information, acquiring theoretical and practical knowledge from the best universities in the world and lectures prepared by foreign teachers.
At the end of each training, participants provide feedback on the training taken. This allows to adjust the content of training and reveals other areas of interest for the professional development of academic staff. Training topics are also selected according to the teachers' suggestions for the future training presented in the University teacher survey. The professional development needs of teachers are also formulated by the administration of faculties, academies and study programme committees.
All teaching staff of the program participated in professional development activities over the past three years, selecting those aligned with their teaching and research interests. For example, in June 2023,

Assoc. Prof. A. Kvaraciejus participated in training on “Problem-Based Learning.” This training was part of the project “Development of a Comprehensive University in the Context of University Network Transformation,” conducted by teachers from the Human Studies Center Ltd.

Due to the quarantine, training courses for the period 2021-2022 were mostly distance learning. This practice continued in the post-quarantine period, as distance learning became the norm for many teachers. During the reporting period, teachers were actively involved in various training activities of other organisations both in Lithuania and abroad (more than 80 times). Research, management, design, as well as professional and personal competences have been developed in the programmes of foreign centres, including workshops and programmes organised at the level of Horizon2020, LIFE, COST, INTERREG projects. Other teachers participated in distance learning courses organised by national and foreign institutions. As an example, the following areas of training were: selection of optimal structures for buildings, development of sustainable peatland management, guidelines for sustainable cities, design of monopiles for cyclic loading etc.

During the reporting period, the teachers went on several internships: prof. dr. (HP) A. Povilaitis had an internship in Iowa State University and California Institute of Technology (USA), assoc. prof. dr. M. Dapkienė - University of Palermo (Italy), assoc. prof. dr. R. Skominas - Brunel University of London (UK), assoc. prof. dr. R. Šadzevičius - Water Centre of SGGW (Poland). The internships were closely related to the study programme and contributed to the improvement and updating of teaching materials.

At the end of each training session, participants provide feedback on the training. This allows adjustments to be made to the content of the training and reveals other areas of interest to academic staff for professional development. Training topics are also selected based on suggestions for future training made by academics in the University's faculty survey. Teachers who have received training in foreign institutions usually share their experiences in staff seminars and regular meetings. Overall, the University and other financial mechanisms provide good opportunities for professional development, and the programme's teachers actively use them to improve and develop up-to-date professional competences.

Expert recommendations provided during the last external evaluation related to *Teaching staff*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*The University should find methods and take actions in increasing the number of full-time teaching staff.*	*As part of the implementation of the VMU Strategic Action Plan 2021-2027, one of the indicators of which is "Optimise staff workload by increasing the availability of full-time staff and allowing academic staff to combine teaching and research work in different proportions, up to a maximum of 1.5 full-time positions", the number of hours dedicated to research is being increased in line with the teachers' professional interests and the needs of the programme of study. The increase in research hours for the programme's teachers has resulted in 46 % of the programme's teachers working full-time as of 1 January 2023. This compares with only 40% a year ago.*

Please provide main results of the self-evaluation in the area of *Teaching staff*
Strengths
1. The high scientific, didactic and professional competence of the teachers working in the programme is fully suitable for achieving the study results. 2. The teachers of the programme are active in international mobility, making particularly effective use of the Erasmus+ mobility program.

3. The conditions for improving the competencies of teachers by participating in the implementation of national and international research projects are good. This is reflected in the many projects carried out by the programme's teachers.

Areas for improvement*

1. There is a low level of involvement of new (young) teachers in the teaching activities of the programme. This leads to an increase in the average age of a teacher. **Improvement:** Doctoral studies and the involvement of doctoral students in project activities that motivate young researchers to stay in the University and have part-time pedagogical employment must be intensified.

6. LEARNING FACILITIES AND RESOURCES

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

Vytautas Magnus University provides sufficient material resources that are directly focused on ensuring the quality of studies in order to create the most favourable study conditions for students and teachers, which guarantees opportunities for effective studies. Particularly good conditions are in the AA Campus. It is convenient and inexpensive to stay in compactly located dormitories, while those living outside the dormitories and coming from the surrounding areas to the University in their own cars have excellent transport and free parking conditions. The VMU Agriculture Academy is easily accessible by public transport. Buses number 18 and 32 run from Kaunas city centre, bus and train stations.

Auditoriums and laboratories

There are 311 classrooms at the University which can be used for the study process according to teaching and learning needs. The size of the rooms varies from 2 up to 242 working places for students. Larger groups of students are able to have study courses in VMU Grand Hall possessing 725 seats. The schedule for lectures is designed taking into account the number of students in the course and the number of working places in the classroom. This allows assigning rooms of an optimal size to deliver study courses.

Studies are provided in the rooms with the necessary equipment, rooms are computerised and have internet connection as well as multimedia projecting equipment, audio and video equipment. Video conferences can be held in VMU auditoriums that are provided with the necessary equipment ensuring smooth distance communication and creating suitable conditions for remote collaboration. If needed, additional technical equipment can be supplied to properly organise specific study courses and enable appropriate application of different study methods to assure quality of student learning achievements. 42 computer rooms have been equipped for the study process, and the size of computer classes varies from 4 to 31 working places.

Hydraulic engineering studies are mainly carried out in the 3rd building of the AA, where the Faculty has 12 general auditoriums from 16 to 52 workplaces for lectures and seminars and equipped with modern equipment. If there is a need to combine flows (joint lectures (courses Investment Project Management, Spatial Data Analysis) with Land Use Planning study programme students) there is an opportunity to use larger auditoriums.

Practical works can be conducted in three computer labs (Rooms 436, 100, and 119) with between 15 and 22 workplaces. Lecture rooms are assigned based on the size of the student group and the number of workplaces in each room, ensuring optimally sized spaces for course delivery. Typically, the schedule for theoretical lectures, seminars, and discussions is planned so that students spend the entire day in the same classroom. This arrangement allows them to settle in comfortably for the day, connect their computers, and, during breaks, not worry about leaving their belongings behind.

Although second-cycle students no longer perform basic laboratory work, they have access to specialized instructional laboratories (for hydrology, hydrogeology, hydraulics, drainage and irrigation, etc.) during their studies, where they can conduct individual experiments as part of their

research work. Laboratories for construction materials, hydraulics, and hydraulic structures are particularly popular among master's students.
In addition to instructional laboratories, students have full access to work alongside teachers and researchers in the scientific laboratories of Building and Construction Materials, and Aquatic Ecosystems Research and Modeling. These labs are equipped with modern research equipment, primarily funded through project grants. In these scientific laboratories, students in certain courses (such as Reliability of Hydraulic Structures, Reconstruction of Hydraulic Structures, and Restoration of Disturbed Water Ecosystems) become familiar with and learn to use research equipment, conducting experiments for their final projects. The Building and Construction Materials Laboratory is particularly popular, which is unsurprising given its close connection to the study program.
The possibilities of using the equipment available in the laboratories to solve the scientific problems addressed by the students' research work are shown in Table 6.1.

Table 6.1. Equipment in the Research Laboratories of Structures and Building Materials and Aquatic Ecosystems Modelling used for studies in Hydraulic Engineering programme

Possible common topics for student research	**Equipment in Laboratory of Structures and Building Materials**
Research on the condition of hydraulic structures (hydroelectric power stations, fish ponds, etc.).	*Equipment used to assess concrete properties include:* a Schmidt hammer with verification device, an ultrasonic device for concrete testing, a pull-off tester, core drilling equipment, a compression and flexural testing machine with a 3000/100 kN capacity and software, a specialized climatic freezing chamber with software, a permeability testing device, a device for measuring air permeability in concrete, and a device for determining moisture concentration in concrete. *The following equipment is used for detecting and monitoring structural damage and defects:* a rebar locator, the Canin+ device for assessing corrosion depth and degree, a microscope and graduated ruler for measuring crack width, and equipment for long-term crack monitoring. There is also equipment for testing fasteners and anchors. The "Qysea FIFISH V6 Expert" underwater robot is used for inspecting underwater hydraulic structures.
Research on structural materials (local, renewable, etc.) for the construction of hydraulic engineering structures and agricultural production buildings.	The equipment used for testing *concrete aggregates* includes mechanical sieving equipment with sieves, a Los Angeles abrasion machine, and others. For testing *concrete mix (fresh concrete),* the devices used are a concrete mixer, compaction equipment, a standard cone, and a flow table. A device with necessary attachments is used to measure the adhesion strength between repair mortar and old concrete. A thermal imaging camera is used to examine heat losses, and an infrared (IR) temperature and heat flow meter is used to measure heat flow through partitions.

Innovation and research on geofiltration safety in hydraulic structures and infrastructure for agricultural production buildings.	The following devices are used: geological drills; a Proctor device for determining Proctor density (optimal moisture content); a cone penetrometer for measuring liquid limit; drying ovens, and other equipment.
Possible common topics for student research	**Equipment in Laboratory of Aquatic Ecosystems Modelling**
Water pollution and measures to reduce it. Restoring disturbed aquatic ecosystems.	Portable pH meter, CO_2 analyzer, bathometer, portable calorimeter for water testing, 17-parameter multiprobe for water testing, and others.
Changes in water balance elements, modelling hydrological and hydraulic processes, drainage and irrigation systems.	Soil moisture meters, dynamic penetrometer, porometer, mobile ultrasonic Doppler device, real-time water level sensors, rain gauge, and others.
Water resources management and sustainable use (hydropower, flood risk management, inland waterways, rehabilitation of water bodies).	Propeller-type water velocity meter, water level recorder with data logger, and others. Professional drone with a high-resolution 20 MP RGB camera, "Autel EVO II PRO." It can perform missions and collect data from selected areas, which is used to create ultra-high-resolution orthomosaics (orthophotos).

Many of these classrooms and laboratories are equipped with specialised visual aids and equipment. The study facilities meet the requirements of occupational and hygiene standards. During the last seven years all classrooms and laboratories (in which the field studies take place) were renovated and adapted for students with special needs.

All the buildings are adjusted for disabled people: elevators, automatic doors, lifts for wheelchairs, brightly marked stairs have been installed. Students with disabilities have access to parking near the University buildings; the entrance to the buildings is constantly maintained and renovated; libraries have equipment for the disabled to create working places for them, classrooms are with the necessary furniture. Students with disabilities have the opportunity to stay in dormitory rooms adapted for them, if necessary, with an accompanying person. The study process is organized according to the individual needs of students; disability education campaigns are organised; data on students with disabilities are integrated into the databases, thus allowing to facilitate the entire study process for students with disabilities.

Specialized software

All students have access to specialized software purchased with general university funds. This software is used by students across various programs and faculty from different departments, with a sufficient number of licenses available. Educational versions of some programs are also used for specialized studies (Table 6.2). The faculty has acquired single licenses for certain highly specialized programs (e.g., Geoslope), which are primarily used for scientific research or the preparation of final thesiss; thus, additional licenses are currently unnecessary. When a need is identified, efforts are made to secure financial resources to increase the number of licenses. In 2024, licenses for BIM Collaborate Pro and GEO5 were purchased following this approach.

Table 6.2. Software used for programme studies

Software available on VMU intranet and libraries		
Softwre	Purpose (Study subject)	Library
PSS IBM *Statistics* 22	Qualitative data analysis programme (Research Methodology)	Vaclovas Biržiška Library Leonidas Donskis Library Mykolas Romeris Library

NVivo 10 *for Windows*	Qualitative data analysis programme (Research Methodology)	Vaclovas Biržiška Library Leonidas Donskis Library
Statistica 10	Qualitative data analysis programme (Research Methodology, Research Work -2, Reliability of Hydraulic Structures)	AA library
ArcGIS Desktop 10.8	Programme for mapping and spatial analysis (Spatial Data Analysis)	AA library
ArcGIS Pro 2.6.3	Programme for mapping and spatial analysis (Spatial Data Analysis)	AA library
Specializuota programinė įranga		
HEC-RAS	1D and 2D Hydrodynamic modelling (Hydrologic Modelling System)	Freely available online
HEC-HMS	Hydrological modelling (Hydrologic Modelling System)	Freely available online
HYPSE, *Promethee*, DAM	Sprendimų paramos sistemos (Decision Support Systems for Water Management, Research Methodology, Water Power Plants)	Freely available online
HEC-*ResSIM*	Decision support systems (Hydrologic Modelling System)	Freely available online
MikeUrban	Modelling of water supply and sewage networks (Optimization of water supply and sewer systems)	1 license was purchased by the Faculty
EpaNet 2.0 (LP)	Water supply modelling (Optimization of water supply and sewer systems)	Freely available online
SWMM (*Storm Water Management Model*)	Modelling of sewage networks (Optimization of water supply and sewer systems)	Freely available online
PLAFI	2D Hydrodynamic modelling (Modelling of Seepage)	Educational version created by Faculty staff
GeoStudio programų komplekso Slope/W ir Seep/W moduliai	Slope stability modelling; Geofiltration modelling (Modelling of Seepage)	1 license was purchased by the Faculty
AutoCAD	Graphical Automated Design System (Design of Hydraulic Structures)	There are educational versions
Civil 3D	Civil and environmental engineering design (Urban Water Management, Technology of Drainage and Irrigation)	There are educational versions
RETScreen Expert	For analysis of CO2 emissions from hydro, solar and wind power (Water Power Plants)	Freely available online
SketchUp	Architectural design of buildings and structures (Design of Hydraulic Structures, Building Information Modeling (BIM))	Freely available online
AutoDesk Revit	Architectural design of buildings and structures (Design of Hydraulic Structures, Environment Protection Structures)	There are educational versions
AutoDesk Robot Structural Analysis"	Structural analysis of buildings and structures (Design of Hydraulic Structures, Environment Protection Structures)	There are educational versions
„Atraminė sienutė“, „Sija ant tampraus pagrindo“ „Vamzdis	Structural analysis of reinforced concrete structures for hydraulic structures (Design of Hydraulic Structures)	Educational version created by Faculty staff

ant tampraus pagrindo“, „Plokštė“		
Wondershare Filmoa	For processing video recordings of research results (Reliability of Hydraulic Structures)	1 license was purchased by the Faculty
Arc Hydro	GIS modelling and hydrological calculations (Restoration of Disturbed Water Ecosystems	Free version
GEO5 Package Educational 10	For analysing and solving geotechnical problems (Design of Hydraulic Structures)	Fakulteto įsigyta 1 tinklinė licencija (10 darbo vietų)
BREAKWAT	For modelling coastal protection structures (Reliability of Hydraulic Structures)	There are educational versions
SNAP	For satellite image processing (Reliability of Hydraulic Structures, Building Information Modeling (BIM))	Free version
SES3	For construction economic calculations (Reconstruction of Hydraulic Structures)	Educational version provided by the producer
PIX4D mapper	For photogrammetry (Reliability of Hydraulic Structures, Building Information Modeling (BIM))	1 license was purchased by the Faculty
BIM Collaborate Pro	Autodesk Construction Cloud (Building Information Modeling (BIM))	1 license was purchased by the Faculty
34 software applications were used in the study process in 2023/2024 study year		

Virtual study environment

Students and teachers are provided by a virtual learning environment and collaboration system – *Moodle*. This distance learning environment allows teachers to create digital content of study courses, to choose different forms of organisation of study courses, to organize practical activities in various ways, to share teaching and learning instruments, to evaluate learning achievements and monitor their progress, to receive and provide feedback. All the functions necessary for teamwork have been realised in *Moodle*.

VMU distance learning environment Moodle is updated every year, which expands the possibilities of the environment and ensures the selection of the latest functions. Operating systems of Linux server and data storage are constantly updated.

Important VMU IT tools for presenting study information are the Student Portal and the Teacher Portal. The main principles of the Student Portal: centralized (based on integrated services) provision of information on the study process to students; possibility to integrate other information systems. The portal operates in a bilingual mode – in Lithuanian and English. Teacher Portal is an analogue to the Student Portal, and its main functionalities include monitoring of registration to study courses, electronic student achievement records, review of teaching quality assessment results. The system operates in a bilingual mode.

Library

The University library aims to create and constantly improve favourable information environment for studies and research, ensuring effective services for the members of the University community, organizing access to information resources necessary for the studies, research, professional qualification, developing information literacy competencies, implementing open science principles and practices.

A modern physical infrastructure of Library departments has been created in faculties and academies allowing to provide conditions for effective response to the research and study needs of academic units. Members of the University community can visit all departments of the Library and use its all services, regardless of which faculty or academy they study or work in. The library has created 566 workplaces for them, visitors can work with 132 Library or personal computers (280 workplaces).

Visitors also have an opportunity to access individual (17 places) and group work (72 places) rooms, workplaces for visitors with disabilities (17 workplaces for visitors with special needs have been installed in all departments of the Library), discussion spaces and recreation areas. Copying, printing, scanning devices are available on the Library premises. Opening hours for individual / group work can be booked in advance via Library website.
All departments of the Library are equipped with workplaces for users with special needs, and they can find the following software there: JAWS 14 for Windows, Win Taker Voice 1.6, Super Nova Magnifier, Easy Converter, Goodfeel Braille music translator, personal hearing system Bellman Audio Domino Pro, text to speech programme Balabolka. The following technical equipment is available for the users with special needs: electronic Braille device ESYS 40, Braille and tactile printers, stationary magnifier TOPAZ XL XD 24, keyboards for the visually impaired, alternative computer mice, height-adjustable self-service desks for issuing/returning publications, height-adjustable tables, rolling tables on wheels or without wheels, ergonomic chairs.
By 2023 the Library Fund had accumulated over 1,7 million of information resources, almost 1 million of them are printed documents and other documents of physical media. The dominant type of information sources is electronic information resources, which is clearly revealed by the constantly growing indicators of their demand and usage. VMU community members can use purchased, licensed, published by the University, digitalised electronic information resources at any time of the day. The newest and most relevant information required for studies and research is available to members of VMU in subscribed databases, VMU Research Management System (CRIS) and VMU virtual library.
The University community has access to over 787 thousand electronic resources (over 570 thousand e-books, 48 thousand e-journals, 167 thousand conference presentations, 83 thousand standards and other e-documents, 2,8 million legal acts and cases), 63 licensed databases. E-documents can be accessed on the University premises and from remote computers (via *EZproxy*) 24/7. In the guide by subjects (*SubjectPlus*), users have the opportunity to find systematic links to thematic information contained in the University's, licensed or open access academic resources according to the study courses.
The aim of the Library is to create user-friendly conditions for access to information resources. The most necessary printed documents (over 240 thousand publications in open funds) are freely available to users and stored according to research fields, the search for publications is facilitated by information notes and various virtual aids. All information about the available collections and access to them is available on the library website, in the virtual library, in the institutional Research Management System. To improve the infrastructure for studies and research as well as access to information resources, Alma/Primo Ve (ExLibris Part of Clarivate), a new generation library service platform operating on the basis of cloud computing, was installed in 2022 and is now used.
An important information resource is University Research Management System (VMU CRIS) – an open science information system. With its help, the University's study and research production is accumulated, stored and its dissemination in the world is ensured. The interactive cross-links among scientific publications, their authors, departments and ongoing projects help the user to get fully acquainted with the research and study production and activities of the University. The system has accumulated over 124 thousand University publications, journal articles, study final theses, doctoral theses, other publications, over 47 thousand full-text documents.
The library has self-taking / returning devices (RFID), which allow users to borrow / return publications themselves and extend the deadlines for returning publications. A self-return device installed in the wall of the Library building on 52 Donelaitis street gives a possibility to return the borrowed publications 24/7.
The information resources of the library for studies in the field of Civil Engineering are fully sufficient (Table 6.3). Printed documents in the field of Civil Engineering are stored in the AA library, a smaller number of publications on this topic are kept in other departments of the library. The traditional library of the students of the study programme is the library of the AA.

Table 6.3. Information resources for studies in the field of Civil Engineering

Main information	Printed documents	Electronic resources
The fund has a total (pcs.)	971 984, of which 268 445 in the library of AA	787 902, 63 licensed DB, Works published by the University and researchers in the VMU Science Management System (VMU CRIS), VMU Virtual Library VMU virtual library
Documents in open collections (pcs.)	~ 241 thousands (240 888), of which 40 thousand in the library of AA	Access to electronic resources in VMU computer network and from remote computers around the clock
Total use of documents	41 659, of which 9 529 in the library of AA	~ 2.2 mln. (searches and views) ~ 2 mln. (downloads: full-text documents and summaries
Information resources acquired by the library (2023) Eur, for:	~ 83 thousand (83 345)	938 471 (university and project funds)
Resources for the Civil Engineering field of study		
Recources (pcs.)	~ 10 800, of which 9 thousand in the library of AA	25 980 (25 657 e-books; 323 e-journals; 208 VDU ETD)
Resources acquired (2023 m.) Eur, for:	239.74	30 945

VMU licensed databases recommended for studies in the field of Civil Engineering. Multidisciplinary, full-text databases: Academic Search Complete (EBSCO), ASABE (American Society of Agricultural and Biological Engineers) Technical Library, Ebook Central (Academic Complete), eBooks on ScienceDirect, EBSCO eBook Academic Collection, Emerald Management eJournals Collection, Oxford Journals Collection, SAGE Journals Online, ScienceDirect, SpringerLink, SpringerLink Archive, Taylor & Francis, KTU publishing house electronic books, Vilnius TECH publishing house electronic books.
Evaluation tools of scientific results: InCites Benchmarking & Analytics (Clarivate Analytics), InCites Journals and Highly Cited Data (Clarivate Analytics), Web of Science (Clarivate Analytics).
Specialized literature is also accumulated in the libraries of the Faculty departments. The students preparing their final theses use the literature accumulated in the institutes during the implementation of projects obtained through communication and cooperation with foreign researchers.
In order to prevent plagiarism, copyright infringement and to recognize/evaluate text created by artificial intelligence, the library administers text matching programmes iThenticate and Oxsico. Using the latter program, the students themselves can upload a written work or a part of it to the system and receive a report on the coincidence of texts formed by the program.
The library conducts contact and remote information literacy training, which aims to provide knowledge about information resources, their search and access possibilities, to develop effective information search and selection skills, to acquaint with the principles of academic integrity, to provide information on correct citation of information sources in studies or research. A basic information

literacy training course of 3 academic hours is taught to the students. Video presentations about the library, its services, searching for information resources, licensed databases and other relevant topics are available for distance learning in Lithuanian and English.

Sports and leisure

VMU features the largest university sports complex in the country named after President Valdas Adamkus which is adapted to various sports, study and leisure needs. This sports complex is intended for the needs of the University community and consists of grandstand building, court for basketball, indoor football, volleyball and other sports, football stadium with running tracks and long jump sectors, outdoor basketball courts, ground tennis court, artificial grass tennis court, sand volleyball court and universal court. The outdoor grandstands are equipped with 1000 seats. The VMU Sports Center is marked with the acorn badge of the Lithuanian Paralympic Committee, testifying that its premises are friendly for the people with disabilities. VMU is the first higher education institution in Lithuania which received such an evaluation.

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

Study resources are updated according to the resource development plans submitted by the faculties and academies, which annually are prepared according to the study needs. VMU uses a centralized system for monitoring and updating hardware and software (for example, about 20% of computers are renewed annually, VMU computer network security systems are constantly updated), only legal software is used in computer classrooms and other computerized workplaces. Every six months, the software is audited and updated or supplemented. The commercial software used in the study process is used with educational licenses and is available to students free of charge.

Equipment necessary for conducting engineering studies is most often purchased using project funds, university funds, or department funds. Recently, various types of hardware and software have been acquired through diverse funding sources. For example, sponsors such as the Vilnius branch of JSC 'PIPELIFE Eesti AS' donated a stormwater collection system (for the Water Treatment Laboratory), and JSC 'Buiteka' donated a VNB-2 biological wastewater treatment unit. To support coursework in Building Information Modeling (BIM) and Design od Hydraulic Structure for practical assignments, BIM Collaborate Pro and GEO5 software licenses were purchased from university funds in 2024. Additionally, the following were purchased with project funds from 2020-2023:

- Soil Penetrometer PM-1. A dynamic soil penetrometer that enables quick assessment of soil density.
- Professional drone with a high-resolution 20 MP RGB camera, 'Autel EVO II PRO.' It can carry out missions and collect data from a selected area, used for creating very high-resolution orthomosaics (orthophotos). The PIX4D Mapper software has been acquired for image processing.
- Computer 'Workstation DELL Precision 3660 Tower CTO BASE (210-BCUR)' designed for processing and analyzing large amounts of data, as well as for machine learning modeling.
- Hydrostatic gauge, data logger 'Onset HOBO Water Level Data Logger U20L-01' designed to measure and record water level data. Used for studying hydrological phenomena.
- Schmidt Hammer 'Proceq SilverSchmidt OS8200N' – for testing concrete strength and uniformity using rebound hammer technology.
- Underwater robot 'Qysea FIFISH V6 Expert' designed for inspecting underwater hydraulic structures. It has the capability to operate additional tools: a robotic arm, water and substrate sampling devices, sonar, ADCP, various types of sensors, etc. This allows the device to be used for a wide range of surface water body and ecosystem studies.
- Sonar 'GO9 XSE Multi-function display with Active Imaging 3-in-1,' used for surface water body studies, depth recording, bathymetric mapping, and navigation.
- Nano bubble generator.

This equipment is used in courses such as Reliability of Hydraulic Structures, Restoration of Water Bodies, and others, as well as for preparing final thesis. Department funds are primarily used for

smaller departmental purchases, tools, equipment, or materials needed for constructing displays and similar purposes.
Faculty researchers are actively involved in programs funded by the Research Council of Lithuania, ministries, government, or EU funds, and they prepare competitive proposals. Eight percent of the revenue from commissioned research and applied projects is allocated to the development of the faculty's and department's study and research infrastructure.
When planning the renewal of information resources relevant to studies, the need for study resources is coordinated with the Library by the teachers responsible for study programmes and courses. Also, the analysis of the flow of study scientific publications is performed and recommended for acquisition by teachers and responsible Library employees – faculty curators (subject librarians). Faculty curators maintain constant contacts with the councils of individual faculties, institutes and academies, inviting teachers to participate in the development of information resource collections, offering to purchase new printed and electronic documents relevant to studies. The Description of the Procedure for Forming the Information Resources Fund of VMU defines the principles, criteria and sources for the formation of the information resources fund, the amount of information resources to be acquired, the search for and access to resources, the structure of the library fund as well as the monitoring indicators of the information resources fund.
The academic community has the opportunity to submit proposals regarding the need for publications to the Information Resource Formation Unit of the Library by filling in an interactive form on the Library website and indicating the need for the quantity, format and storage space of the required publications. Teachers receive feedback on the availability of the requested resources, deadlines, storage location and access conditions. The University community can order publications from Lithuanian and foreign libraries that are not available at VMU Library. This can be done through the Interlibrary Loan system by completing Interlibrary Loan Request.
The library performs the analysis of the use of documents intended for study programs on a regular basis. The obtained results become a tool for a more targeted stock formation, by supplementing the stock with missing documents, reviewing and updating the procedures for the item acquisition.

Expert recommendations provided during the last external evaluation related to *Learning facilities and resources*			
No	*Recommendation*	*Actions taken by the HEI*	*Comments*
1.	*Continue to improve the Learning facilities and resources.*	*The update of the material resources of the study programme is discussed in the Department of Water Engineering at the end of each academic year. When the need for updating material resources arises, the need is submitted to the administration of the Faculty of Engineering. At the end of the academic year 2021-2022, the library resources were extended with the textbooks required for the study programme.* *In 2021 - 2024, specialised computer softwares and specific equipment for research were purchased.*	*Student research is increasingly focused on existing scientific laboratories. An investment project on "Upgrading Climate Friendly Research Infrastructure" is currently under preparation.* *A plan for the purchase of new equipment is prepared each year and submitted to the VMU Finance Office.*

Please provide main results of the self-evaluation in the area of *Learning facilities and resources*
Strengths
1. Students of the VDU Agricultural Academy's Faculty of Engineering have access to high-quality lecture rooms and study spaces, each equipped with the necessary technical and software resources, internet access, and physical resources that meet today's standards. Students also have the option to live in university dormitories. 2. In master's studies, students have access to scientific laboratory equipment and tools that meet modern research and methodology standards. Learning resources are adapted for remote learning, taking into account changing circumstances. Technical and administrative support is readily available. 3. The VDU library facilities are among the most modern in Lithuania. The library regularly updates its electronic and printed resources, and the number and variety of licensed electronic databases that meet the needs of the Civil Engineering study program.
Areas for improvement*
1. Since specialized software is quite expensive and accessibility remains limited even with a few licenses, it is necessary to promote the use of open-source software. Good examples include HEC-HMS and HEC-RAS. Additionally, further use of QGIS—an open-source GIS software—and similar programs should be encouraged. 2. The administration should continuously monitor the needs of students and staff and improve the study environment. By utilizing project funds and engaging with sponsors, it should acquire modern software and hardware necessary for advancing the respective field of study.

7. STUDY QUALITY MANAGEMENT AND PUBLICITY

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

VMU study quality assurance includes purposeful and targeted planning, implementation, evaluation and improvement of studies in order to achieve their compliance with the priorities of higher education, legal requirements and the needs of stakeholders. Decisions regarding the quality of studies and their management are based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (2015), national and VMU legal acts. The main VMU documents regulate the following issues:

- VMU Statute (2018) determines general principles of quality assurance of studies and research.
- VMU Quality Manual (2022, new edition) systematically presents the concept, principles, responsibilities and processes of quality assurance as well as related documents and quality indicators aimed at the continuous quality enhancement of studies, learning, research and artistic activities, and doctoral studies.
- VMU Study Regulations (2024, new edition) describe the processes and responsibilities distribution in study quality assurance.
- Description of Procedure for Study Quality Assurance at VMU (2022, new edition) defines in more detail quality assurance processes, instruments and responsibilities when planning, implementing, evaluating and improving studies.
- Description of Procedure of Feedback for Improvement of Quality of Studies at VMU (2022, new edition) regulates gathering information from different stakeholders and data application as well as dissemination for evaluation and improvement of studies.
- Description of Procedure for Study Course Attestation at VMU (2019, new edition) determines evaluation of study courses in accordance with programme aims, learning outcomes and study process needs. This description requires the assessment of courses to be performed at least every 3 years.

- Description of Procedure for Organisation of Online and Blended Studies at VMU (2020) regulates the assessment of the suitability and attestation of study courses for online and blended studies.

The documents mentioned above are made public on the VMU website in Lithuanian and English.
The University Senate and Rectorate discuss strategic issues of study programmes in the field, and they approve essential renewals. Study Quality Unit (SQU) develops and applies strategies and measures to ensure the quality of studies, monitors the quality of studies and provides recommendations for improvement at the university level. Institute of Innovative Studies coordinates quality assurance of online and blended studies at study course level. Studies-related decisions are made by the Faculty/Academy Council, the Study Programme Committee (hereinafter the Committee), Dean of the Faculty/ Chancellor of the Academy and Head of the Department.

The *Faculty/Academy Council* is responsible for the quality assurance of the whole study field, and during each spring semester it considers the issues of the study field and makes decisions on the improvement of the field. For example, the Council discusses major renewals of study programmes in the field, results of study programmes' internal assessment and study programmes' quality improvement plans.
The *Committee's* main responsibilities include coordination of the Programme's implementation regarding the curriculum related questions and assurance of the Programme quality. The Committee performs internal Programme quality assessment and renewal, it is responsible for preparation and implementation of the Programme quality improvement plans. The Committee assures correspondence of the Programme learning outcomes to labour market and society needs, it keeps contacts with social stakeholders and assures their involvement into the Programme. The Committee makes decisions by common agreement, and they are documented as meeting minutes.
The Head of the Department and the *Dean of the Faculty/ Academy (Chancellor of the Academy)* supervise the Programme implementation from the administrative point of view. For example, they deal with the organization and administration of study schedule and facilities, dissemination of information on studies, recording of teachers' workload, student registration, documentation of studies, etc.
The Committee of *Hydraulic Engineering* programme is composed of *7* members: *5* teachers, *1* social partner and *1* student.
Responsibilities among the Committee members are shared as follows:

- The chairperson is in charge of coordination of Programme quality assurance and effective Committee work, he organises annual Programme assessment and preparation of quality improvement plans as well as monitors implementation of these plans.
- Teachers belonging to the Committee are responsible for revision of the Programme learning outcomes and curriculum design so that to keep to the newest research, subject-related, didactic requirements and trends. They disseminate good examples of international experience, carry out Programme self-assessment, give suggestions for the Programme improvement and follow decisions on improvement.
- The social partners' representatives participate in the revision of the Programme learning outcomes in line with labour market needs and give recommendations for renewal.
- The student representatives give suggestions for the Programme renewal based on own and other students' proposals and participate in implementation of these renewals.
- The Chancellor of the Academy coordinates the quality of the implementation of the study process (approves the composition of the SPCs, the topics and supervisors of the final thesis, the final thesis defence committees, etc.).
- The Dean of the Faculty is responsible for ensuring the quality of the implementation of the study process. For example, he reviews and updates the implementation plans, deals with the organisation and technical administration of the study field, is responsible for the dissemination of information, student registration, documentation of studies etc.

- The Head of Department is responsible for the selection of teachers (together with the SPC and the Dean) and the accounting of their workload and the implementation of the programme. The Head of Department ensures the implementation of the study programme in accordance with the needs identified by the Committee or the necessary changes in staffing requirements.

Students' representatives can make proposals at both faculty council and programme committee meetings, as well as in conversations and regular meetings with heads of departments. Representatives of employers, graduates, teachers, and students of the programme (as well as all employees involved in its implementation) are encouraged to submit proposals for the renewal of the programme. Teachers are responsible for the teaching quality, content and material of the study course, content update, the choice of appropriate study and evaluation methods and clear assessment criteria. Teachers are requested to agree with students on their expectations of the course in the first lecture of the semester. Also, thanks to the prevailing organisational culture based on face-to-face communication, teachers are usually able to elicit students' views on various aspects of the quality of the course while they are still in the course of their studies, so that they can be taken into account during the semester. During the last lecture open discussion with students is organized on how much the expectations of the students were met, what competencies and at what level they developed, what are the positive and negative aspects about the teaching of a study course can be summarized and directions for improvement can be predicted. An anonymous survey of students for the assessment of each conducted study course is carried out every semester, helps the teacher to improve study course – topics, study methods, assessment methods etc. Then the teacher analyzes the results of feedback and makes suggestions for improvement during programme committee meetings, discussing specific cases with the heads of departments. As a rule, meetings that examine the quality of studies, the study programme, and specific issues of updat-ing study courses are held at the end of the semester (at least twice a year). The programme committee constantly advises the teachers of the study programme on the implementation of the study programme and its improvement. Such a procedure allows the open participation of all stakeholders in the programme and contributes to the successful renewal of the programme and its study courses.

The programme committee requests, initiatives and decisions are discussed at the Dean's Office of the Faculty and approved by the Faculty Council. The programme committee initiates and coordinates the approbation of study courses every three years. At the same time, the content of certain courses is constantly reviewed and approbated in semi-remote form in Moodle. The last date of the study course approbation was in 2024, the teachers updated and improved the descriptions of study courses.

The Committee performs a periodic internal assessment: in order to identify strengths and weaknesses of studies, the Committee carries out the analysis of studies each year following statistical study information, data gathered by surveys and other methods as well as integrating the results of external assessment. The results of the analysis are discussed with the Head of the Department/ Director of the Institute, the Dean of the Faculty/ Chancellor of the Academy, the Faculty/Academy Council, and they are also presented during the meetings with students, alumni, employers.

Results of the assessment are applied by the Committee to plan the actions for the improvement of Programme when preparing annual study programme improvement plans. These plans are developed and their monitoring is carried out following the form that has been approved by the University Senate. The Committee is responsible for the implementation of the plans and discusses their progress in meetings twice a year. The improvement plans of all the programmes in the field are agreed with the management of a Faculty, and they are presented for the Faculty Council. The decisions on the renewal of the Programme are made in cooperation with Study Department, International Cooperation Department, Library and other University divisions responsible for organization and administration of studies.

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

Stakeholders of studies are involved in quality assurance through the following actions:

- *Teachers* are invited to present their comments and suggestions regarding improvement in the Department/Institute, Faculty/Academy as well as the Committee meetings, and via surveys. Teachers directly participate in study quality assurance through the enhancement actions at the study course level, when sharing their best practice with other teachers as well as through a systematic involvement in their own professional development. Teachers also have opportunities to actively participate in the quality enhancement actions at the study programme level.
- *Students* give their assessments of studies through the student representative in the Committee, Faculty/Academy Council, group representatives, via student surveys, discussions, conversations and in direct discussions with teachers. Students are invited to get actively engaged in the study classes and to perform individual tasks in a consistent way, student representatives participate in the planned improvement actions of the study programmes.
- *Social partners' representatives* in the Committee suggest their remarks regarding the Programme correspondence to labour market requirements, relevance of student practical skills, etc. Information from social partners is also collected via surveys, during Career Days at the University and in targeted discussions, for example discussing student practice and research project issues, joint project possibilities, etc. The most active social partners significantly contribute to the quality enhancement activities.
- *Alumni* suggestions are identified via surveys and during meetings organised by Alumni associations and the Faculty/Academy representatives, and the Programme alumni are active participants of the discussions to provide recommendations for study quality development.

To ensure proper student involvement in the implementation of quality assurance activities, VMU Student Representative Council (hereinafter - SRC) carries out activities related to the student representatives' training. The SRC elects and delegates student representatives to VMU Council, Senate, various commissions, Student Parliament, faculty councils, study program (field) committees, course elders of study programs, dormitory councils. SRC seeks to ensure that the student representatives' duties, responsibilities and rights are well understood by the student representatives themselves, well known and clear to other students, and the activities of all representative bodies are consistent and transferred from one cadency to another. A large part of SRC communication takes place through Facebook platform, various internal groups and via e-mail. Students are provided with information packages, representatives' memos, regular representatives meetings are held, during which the most relevant problem is selected, possible ways of solving it are discussed, solutions are sought together in the most suitable and fastest way, representatives share their experience and effective ways of solving problems with each other. SRC organizes trainings for student representatives and their groups (for example, together with SQU, trainings for student representatives of study program (field) committees were held), trainings for first-year students' mentors, exam observers, and carries out other initiatives.

The social partners are members of the Business and Social Partners Advisory Board of the Chancellor of VMU AA. The suggestions of stakeholders are discussed in the Committee meetings, and decisions are taken to use them for quality improvement. Significant information come from the results of periodic electronic surveys aimed at gathering information from different stakeholders:

- The survey of teaching and learning evaluation of the study courses is conducted at the end of each semester. The students are asked about teaching regarding a list of criteria (organisation of teaching, methods for student active participation, clarity of the course delivery, content illustration by examples, clarity of evaluation criteria, feedback on completed assignments, information delivery in distance environment, behaviour compliance with ethical requirements). Students are also inquired about their own involvement in learning, and they are requested about completed tasks, class attendance and general self-evaluation of their own work.
- The survey of first-year bachelor students regarding the reasons for the choice of studies and their expectations as well as opinions about studies is conducted at the beginning of studies.
- The survey of graduating students (EXIT) about the studies, final theses, and the preparation for the labour market are conducted at the end of the studies.

- The survey of alumni on their adaptation in the labour market and career is conducted 12 months after graduation.
- The survey of teachers is conducted in spring semester to identify their opinion and suggestions about the teaching, professional development, students' involvement into the studies and working conditions for teaching.

At the initiative of the Faculty / Academy, other surveys are also performed under demand to find out specific information about studies. For example, the surveys of employers are conducted to evaluate the preparation for work by alumni and the students who have completed internship as well as alumni adaptation in the labour market.

University surveys are conducted using an electronic survey system, which is used to collect the results of surveys of different years; the results are conveniently and clearly displayed in the system. Access to the surveys' results is provided to the administration and the Committee, who share aggregated information with teachers, students and other stakeholders. Moreover, all teachers of the University have access to the detailed results of the survey on teaching and learning in the study courses they provide each semester.

When surveys are over, in 3 months the summarized results of the feedback data analysis are presented to social stakeholders who have provided the feedback as well as other members of the University's and external stakeholders. The results are publicized on VMU website, emailed to students and teachers, stored in *Outlook* folders, delivered in social media, and shared by other channels.

The collection of feedback information is coordinated, the data is analyzed and summarized, the results are stored and made public by the University divisions that organize the collection of specific feedback information: VMU Study Quality Unit is responsible for centralized study quality surveys, other surveys are handled by the administration of faculties/academies, Committee, Student Representative Council, Career Centre, etc. Detailed information on the responsibilities for feedback is provided in Description of Procedure of Feedback for Improvement of Quality of Studies at VMU.

Social partners are informed about changes in the study program and ongoing processes through professional organizations and associations (such as Lithuanian association of Land Management and Hydraulic Engineers, Association of Lithuanian Land Reclamation Companies, etc.). Since social partners participate in the activities of study program committees, they receive information through activities organized within these committees. Additionally, SPC members, being members of the councils of these organizations, present the information to the councils.

The Committee uses survey results and information obtained from other sources about the studies to conduct an annual analysis aimed at identifying the strengths of the program and areas for improvement. The analysis is based on the following evaluation criteria:

- alignment of the study program with the latest scientific trends and labor market needs,
- demand for the study program,
- suitability and sufficiency of material resources,
- professionalism of the program's teachers,
- student progress,
- mobility of students and teachers,
- other relevant criteria.

The results of the analysis are discussed with the Head of Department and the Dean of the Faculty and presented at meetings with students and teachers.

In summary, it should be noted that social partners are involved in ensuring the quality of studies. Social partners are part of the VMU AA Chancellor's Advisory Board for Business and Social Partners. Suggestions from social partners are discussed in Committee meetings, where decisions are made on how to use them to improve study quality.

Members of the VMU AA Alumni Club are particularly active and regularly participate in the study process. Employers join professional organizations such as Lithuanian association of Land Management and Hydraulic Engineers, Association of Lithuanian Land Reclamation Companies. Each year, new cooperation agreements are established with targeted business companies that offer topics for practical and final projects as well as laboratories (as available) for conducting them,

providing consultation and proposing relevant research directions. For instance, in September–October 2024, two targeted agreements are being arranged—with JSC "Geoanalizė" and JSC "Tyrent Lietuva." In 2023, an agreement was signed with JSC "Vilniaus vandenys".
The social partners host student groups on excursions, organise discussions, and present hands-on experiences in their subjects.
The survey found that students ranked the ability to express themselves (ranked first by 18% of respondents) and the attractiveness of the study process (ranked first by 21% of respondents) as the most important indicators of the quality of studies for them.
Employers responding to the quality indicators of studies emphasise the graduates' readiness and ability to think independently, to solve engineering problems and to do so professionally. All groups of employers (public institutions, construction businesses and design companies) unanimously ranked working conditions in the broadest sense (e.g. software management skills in GIS, BIM, etc.) as a result of the quality of the studies (61% to 88% ranked it first).

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

Information about studies is gathered, analysed and evaluated in order to assure regular self-assessment and improvement. Annual analysis of studies allows to identify shortcomings in time and to take necessary actions for improvement while a more comprehensive analysis of the Programme is done for external evaluation in more detail to cover various issues of studies. The annual analysis of the Programme includes the following main issues: compatibility between the Programme and newest research trends, correspondence between the Programme and labour market needs, demand of the Programme, suitability and sufficiency of the programme resources, teachers' competence, students' progress, students' and teachers' mobility as well as other issues. The following statistical information collected in a centralized way at the University and available to the Committees and Faculty administration is analyzed: admission to studies, number of students and teachers, support provided to students, students' and teachers' mobility, graduation of studies, graduates' employment and other information. The annual analysis of the programme also integrates opinion of stakeholders and teaching and learning quality evaluation that is performed at the end of each course. This evaluation gives possibilities for teachers to monitor their teaching and respond to students' suggestions, as well as this evaluation invites students to think over their own learning and consider possibilities for improvement.
Questionnairing of stakeholders is a widely used method for determining their opinion and collecting relevant information, while targeted discussions, interviews and conversations help to gather deeper insights and suggestions for improving the quality of studies. For example, the results of teachers' questionnairing are meaningfully supplemented by the results of teachers' interviews on the factors determining the quality of studies. Targeted discussions by faculties /academies and interviews with students help to identify more clearly the advantages and problems of studies as well as to anticipate their solutions.
Results of the assessment (results of surveys and stakeholder discussions, statistical data, external experts' conclusions, etc.) are applied in the improvement of studies by preparing study programme improvement plans and implementing them in order to eliminate the identified shortcomings.
Quality assessment measures are chosen to achieve effective study outcomes. A semi-annual study analysis covers specific questions, while a more detailed analysis is conducted in preparation for external evaluations, addressing various areas of the study program. The surveys include open-ended questions, allowing respondents to provide comments, and their suggestions are later used for program improvement. The results of internal evaluations (survey results, discussions with social partners, statistical data, etc.) are applied to enhance the study program.
The results of teaching quality evaluations are used to improve teaching quality and support the professional development of teachers. Teachers have access to survey results related to the subjects they teach and can review students' feedback and comments. If student evaluation results are poor, the

dean and department head hold discussions with the students and the teacher to address any issues in teaching or assessment that arise.
Sometimes, when assessing the quality of teachers' work, there is a lack of student participation. Due to low student response rates in surveys, there may not be a statistically representative results to draw reliable conclusions. When there are insufficient responses, discussions with students are conducted to better understand the situation. Teachers discuss teaching and assessment principles with students during introductory lectures, and upon completion of the course, they remind students of their responsibility to actively participate and evaluate the teacher' work.
The results of the survey are also presented to the Chair of the Committee, and the main trends in the evaluation of teaching are discussed at the Committee meetings, and decisions are taken on what actions need to be taken to improve the quality of teaching.
Key study decisions (including those involving evaluation and improvement) are made publicly available to social stakeholders through a variety of information channels. The Chair of the Committee shall provide information to teachers, social partners and other social stakeholders, the Head of Department, the Dean of the Faculty and students.
In the 2024 surveys, the social partners report that in 44.3% of cases (N=61) they prioritise graduates with a Master's degree in Civil Engineering as their first choice in recruiting applicants, and in 65.6% of cases they prioritise applicants on the basis of recommendations from the university and other staff. Graduating students of the analysed field of study have a favourable opinion on most of the analysed issues.
Following the expert recommendation to "include more students, alumni, and employers in surveys conducted during studies, after graduation, and 12 months post-graduation to ensure that survey results are more objective when analyzing study program quality and areas for improvement," ongoing connections were maintained with the VMU AA Alumni, employers, and social partners. Meetings and discussions were organized, and additional analysis was conducted using data from the National Education Agency's Education Management Information System (Table 7.1.). In the analysis of graduates 12 months after graduation, it was found that, on average, 84.62% of graduates from 2019–2022 were employed in their field of specialty.

Table 7.1. Data on graduate employability from National Education Agency's Education Management Information System

Evaluation criteria		Percentages
Total employed after 12 months of graduation:	2021–2022*	**84.62**
	2019–2022	87.83
Highly skilled work:	2021–2022*	**63.64**
	2019–2022	64.27
Low-skilled jobs:	2021–2022*	**27.27**
	2019–2022	35.71
Unemployed:	2021–2022* (all foreigners)	**7.69**
	2019–2022 (2.56 %, of whom are foreigners)	9.60

*NOTE: * Career monitoring data are not yet available for this academic year (2022-2023), as the assessment is made 12 months after graduation.*

The external study program evaluation experts' remarks were related to the recommendation to *define a realistic and effective strategy for attracting students to the program. This should be done in collaboration with the Study Quality Department. If the management does not fully utilize the capabilities of the Study Quality Department, it indicates issues within the management and its approach to addressing critical matters, which could lead to program discontinuation*. For the improvement of the study program, it should be noted that the student recruitment strategy is implemented by the VDU Marketing and Communications Department and the VMU AA administrative team, with which both the faculty administration and the study program committee work closely. Continuous collaboration with the Study Quality Department takes place to evaluate

study quality, plan improvement actions, and monitor their implementation based on statistical data, survey results, external evaluation recommendations, and other program information. In the 2021–2027 Strategic Plan of VMU Agricultural Academy, one of the goals is to increase the number of students in undergraduate and graduate programs from 1573 to 2250 by 2027. To achieve this strategic goal, a marketing plan is prepared each year.
To evaluate feedback on survey content and enhance dissemination, additional qualitative surveys were conducted using a focus group and discussion format. In the focus group, internal and external risks in the process of ensuring study quality were identified, such as the number of subjects taught by a single teacher, the intensity of the study process, the balance between assignments and independent activities, the appeal of study methods, and issues with updating technical equipment. Positive aspects of the study process highlighted included laboratories and new tools such as remote monitoring equipment, drones, thermal cameras, underwater drones, etc.
Discussions with the social partners indicate that there is a continuous deficit of hydraulic engineers in municipal departments, design companies, construction organisations, supervisory and public accounting bodies. This has been expressed by municipalities in Biržai, Tauragė, Klaipėda and other districts, administrators of drinking water and wastewater engineering networks, design companies and especially construction companies.

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

The quality of studies was assessed for the period 2021-2024 in the survey "Evaluation of Teaching and Study. Survey of VMU students" analysed the results of the questionnaires submitted by the students (175 in total) enrolled in the Master's degree programme in Hydraulic Engineering at the Faculty of Engineering of the VMU AA (Table 7.2.).

Table 7.2. Assessment of students' opinions on the quality of studies 12/11/2021 – 07/10/2024

1. Please rate the teaching as 10 - excellent, 9 - very good, 8 - good, 7 - average, 6 - satisfactory, 5 - weak, 4 - very weak, 3 - unsatisfactory, 2 - bad, 1 - very bad, 0 - don't know/no opinion/not applicable. Total responses: 175		Average
	Percentage of responses	
The methods used by the teacher encouraged me to be actively involved in the subject I was studying.	10 (76%), 9 (11.43%), 8 (5.14%), 7 (1.71%), 5 (2.29%), 4 (1.14%), 3 (0.57%), 1 (1.14%), 0 (0.57%)	9.40
The teacher has clearly presented the content of the course.	10 (81.14%), 9 (9.71%), 8 (2.86%), 7 (2.86%), 5 (0.57%), 4 (1.71%), 2 (0.57%), 1 (0.57%)	9.53
Teaching was well organised.	10 (81.71%), 9 (8%), 8 (3.43%), 7 (2.29%), 6 (1.71%), 5 (0.57%), 3 (0.57%), 2 (0.57%), 1 (1.14%)	9.50
The teacher has added examples to the course content.	10 (85.14%), 9 (7.43%), 8 (2.29%), 7 (1.71%), 6 (1.71%), 3 (1.14%), 1 (0.57%)	9.63
The teacher evaluated according to assessment criteria that were clear to me.	10 (82.29%), 9 (10.29%), 8 (4%), 7 (1.14%), 6 (0.57%), 5 (1.14%), 3 (0.57%)	9.66
The teacher provided constructive feedback on my and/or my student group's assignments.	10 (80.57%), 9 (13.14%), 8 (2.29%), 7 (1.71%), 6 (0.57%), 3 (0.57%), 2 (1.14%)	9.62
The teacher has provided basic study information on VMU Moodle or other distance learning environments.	10 (89.71%), 9 (6.86%), 8 (1.14%), 7 (1.14%), 6 (0.57%), 2 (0.57%)	9.81
The teacher has followed professional ethics.	10 (93.71%), 9 (5.71%), 3 (0.57%)	9.90
Overall average:		**9.63**
2. How many study sessions did you attend (or did you attend several sessions remotely)?		
All classes.	135 (77.14%)	
The majority of classes.	34 (19.43%	
The minority of classes.	6 (3.43%)	
None.	0 (0)	
3. How many of the assignments (homework, preparation for academic sessions and reports) provided by your teacher have been completed?		

All tasks.	160 (91.43%)
The majority of tasks	15 (8.57%)
The minority of tasks.	0 (0%)
None.	0 (0%)
No assignments provided.	0 (0%)
4. How would you rate your overall performance in studying the subject (attending the lectures given by the teacher, completing the assignments given by the teacher, etc.)? 10 - excellent, 9 - very good, 8 - good, 7 - average, 6 - satisfactory, 5 - poor, 4 - very poor, 3 - unsatisfactory, 2 - poor, 1 - very poor, 0 - don't know/no opinion/applicable.	
Evaluate your work.	10 (45.14%), 9 (28.57%), 8 (17.71%), 7 (6.86%), 6 (1.14%), 5 (0.57%)
Overall average:	**9,08**
5. Your comments on teaching and studying the subject. **Total comments: 46**	
Positive reviews 43 (94 %) from 46, others 6 % comments – recomendations.	

76% of respondents rated the methods used to engage them in the subject as excellent, 11.43% as very good, and 5.14% as good. The clarity of the content presented was rated as excellent by 81.14%, very good by 9.71%, and good by 2.86%. The organization of sessions was rated excellent by 81.71%, very good by 8%, and good by 3.43%. For the sufficiency of examples, 85.14% rated it as excellent, 7.43% as very good, and 2.29% as good. The clarity of assessment criteria was rated excellent by 82.29%, very good by 10.29%, and good by 4%. Constructive feedback provided was rated excellent by 80.57%, very good by 13.14%, and good by 2.29%. The adequacy of materials provided remotely was rated excellent by 89.71%, very good by 6.86%, and good by 1.14% of respondents. Observance of professional ethics was rated excellent by 93.71%, very good by 5.71%, and 0.57% of respondents rated it as a low 3. On average, all respondents rated ethics in teaching at 9.90 out of 10. The overall teaching quality score for the reviewed period is 9.63.

All or most of the classes were attended by 96.57% of the respondents and all or most of the assignments were completed by all students who participated in the survey.

Students rated their work with an average score of 9.08, with 45.14 % rating themselves excellent, 28.57 % very good and 17.71 % good.

When writing comments and recommendations, 94% were positive about the studies, while the remaining 6% of comments were of a recommendation type.

After 12 months, 50% felt well prepared for their career, and 70% of respondents reported that they found the knowledge and skills acquired during the sessions the most useful (Table 7.3).

Table 7.3. Survey data for graduating students (EXIT and Career center) 2022-2023 and 2019-2022.

Evaluation criteria		Percentages
Data from the Graduating Students (EXIT) survey		
Those who rate VMU's contribution to career preparation highly	2022–2023	**50.00**
	2019–2022	41.67
Where the knowledge and skills acquired during study sessions (lectures, seminars, laboratories, etc.) are most useful.	2022–2023	**70.00**
	2019–2022	85.00
Knowledge and skills acquired through independent tasks	2022–2023	**40.00**
	2019–2022	36.67
Knowledge and skills acquired during a study practice	2022–2023	**40.00**
	2019–2022	31.11
VMU alumni survey data on survey respondents working in Career center 12 months after graduation		
To the question "What was the most useful aspect of your career preparation?" referred to as "Teacher support"	2022–2023	**50.00**
	2019–2022	26.67

To summarise, it should be noted that the surveys of the different target groups in the second cycle of the study process are carried out on a regular and timely way, that the analysis is systematically carried out in different sections and that the summarised results are presented to the target groups. The opinions and recommendations of not only students, but also alumni, social partners and employers are used as evidence of the quality of studies.

Expert recommendations provided during the last external evaluation related to *Study quality management and publicity*		
No	*Recommendation*	*Actions taken by the HEI*
1.	*Define a realistic and effective strategy to attract students to the programme. This should be done in collaboration with the QA Unit. If the management does not utilize the QA Unit sufficiently, then there is a problem in the management and the way they handle significant problems that can lead to the closure of the programme.*	*The strategy for attracting students to the program is implemented by the VDU Marketing and Communications Department and the ŽŪA administrative team, with which both the faculty administration and the study program committee work closely. There is ongoing collaboration with the Study Quality Department to assess study quality, plan improvement actions, and monitor their implementation based on statistical data, survey results, external evaluation recommendations, and other study-related information.* *In the 2021–2027 strategic plan of VDU Agricultural Academy, one of the goals is to increase the number of students in undergraduate and graduate programs from 1,573 to 2,250 by 2027. To achieve this strategic goal, a marketing plan is prepared each year.*

Please provide main results of the self-evaluation in the area of *Study quality management and publicity*
Strengths
1. The internal quality assurance system for studies is regulated by 7 documents approved in 2018-2024 and updated regularly. They define the roles and responsibilities of the members of the Study Programme Committee, the administration and other units involved in the organisation of the study process. 2. Social partners are involved in ensuring study quality by assigning specific roles to each interested group based on their field of influence: teachers, students, employers, alumni, and the VMU Student Representation. Social partners are part of the VMU AA Chancellor's Business and Social Partners Advisory Council. Stakeholder proposals are discussed in Committee meetings, where decisions are made on how to utilize them to improve study quality. Valuable information is obtained by analyzing the results of periodic electronic university surveys to gather insights from various social stakeholders. 3. The information is obtained by analysing the results of periodic electronic university surveys to collect information from different social actors: student survey (at the end of each semester); survey of first-year undergraduate and graduate students (at the beginning of their studies); graduate survey (EXIT); graduates' survey on labour market placement and careers 12 months after the start of their studies. A survey of teachers on teaching, professional development, student engagement in studies and working conditions for teaching is carried out in the spring semester. 4. The members of the VMU AA Alumni Club are extremely active and constantly involved in the study process. Employers are united in professional organisations, make suggestions and cooperate in the study process. Every year, new cooperation agreements are signed with targeted business enterprises, which offer practical and final thesis topics and laboratories

(according to their possibilities) for their execution, consult and suggest topical problem areas for research.

5. The majority (75-94%) of respondents rated the methods used, the organisation of the classes, the sufficiency of the examples, the clarity of the assessment criteria, the constructive feedback given, and the sufficiency of the material provided at a distance as excellent. The overall score for the quality of teaching over the period considered is 9.63. 94% of the participants gave a positive feedback on the comments and recommendations.

Areas for improvement*

1. There is a lack of student activity when it comes to assessing the quality of teachers' work. Improvement: additional qualitative surveys are foreseen in a discussion format. This will allow for a deeper analysis of emerging issues.

STUDY FIELD PROGRAMME' PLAN

ANNEX 1

The study plan of the second cycle study programme ***Hydraulic Engineering***

	STUDY COURSES	STUDY FIELD	ECTS	Contact work hours	Independent work hours	The form of assessment	TEACHERS
I semester	*Compulsory:*						
	Restoration of Disturbed Water Ecosystems [HST5003]	Civil Engineering	6	60	100	Individual work, Seminars, Colloquium, Written exam	prof. dr. Arvydas Povilaitis
	Design of Hydraulic Structures [HST5011]	Civil Engineering	6	60	100	Individual work, Practical works, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius, assoc. prof. dr. Gražina Žibienė
	Reliability of Hydraulic Structures [HST5012]	Civil Engineering	6	60	100	Individual work, Team work, Colloquium, Written exam	assoc. prof. dr. Midona Dapkienė, assoc. prof. dr. Rytis Skominas
	In total in the semester		**18**	**180**	**300**		
II semester	**STUDY COURSES**	**STUDY FIELD**	**ECTS**	**Contact work hours**	**Independent work hours**	**The form of assessment**	**TEACHERS**
	Compulsory:						
	Building Legal Regulation [HST5004]	Civil Engineering	6	60	100	Seminars, Colloquium, Written exam	assoc. prof. dr. Rytis Skominas
	Research Methodology [HST5008]	Applied Mathematics and Statistics	6	60	100	Practical works, Seminars,	assoc. prof. dr. Inga Adamonytė

						Colloquium, Written exam	
	Hydrologic Modelling System [HST5006]	Civil Engineering	6	60	100	Coursework, Seminars, Tests, Written exam	prof. dr. Petras Punys assoc. prof. dr. Algis Kvaraciejus
	In total in the semester:		**18**	**180**	**300**		
III semester	**STUDY COURSES**	**STUDY FIELD**	**ECTS**	**Contact work hours**	**Independent work hours**	**The form of assessment**	**TEACHERS**
	Compulsory:						
	Optimization of water supply and sewer systems [HST5015]	Civil Engineering	6	60	100	Practical and team works, Seminars, Colloquium, Written exam	prof. dr. Algirdas Radzevičius assoc. prof. dr. Gražina Žibienė
	Urban Water Management [HST5013]	Civil Engineering	6	60	100	Practical works, Seminar, Colloquium, Written exam	assoc. prof. dr. Egidijus Kasiulis
	Management of Investment Projects [HST5009]	Management	6	60	100	Practical works, Seminars, Colloquium, Written exam	assoc. prof. dr. Inga Adamonytė
	In total in the semester:		**18**	**180**	**300**		
IV semester	**STUDY COURSES**	**STUDY FIELD**	**ECTS**	**Contact work hours**	**Independent work hours**	**The form of assessment**	**TEACHERS**
	Compulsory:						
	Research Work -1 [HST5010]	Civil Engineering	6	4	156	Defence	Supervisor of final thesis

	Building Information Modeling (BIM) [HST5014]	Civil Engineering	6	60	100	Practical works, Colloquium, Written exam	assoc. prof. dr. Gražina Žibienė, assoc. prof. dr. Raimondas Šadzevičius
	Elective (one subject):						
	Restoration of Water Bodies [HST6005]	Civil Engineering	6	60	100	Practical works, Seminar, Colloquium, Written exam	lect. msc. Raimundas Baublys
	Environment Protection Structures [HST6003]	Civil Engineering	6	60	100	Individual work, Laboratory works, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius
	Modelling of Seepage [HST6006]	Civil Engineering	6	60	100	Individual work, Laboratory works, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius
	Water Power Plants [HST6007]	Civil Engineering	6	60	100	Practical works, Seminars, Colloquium, Written exam	assoc. prof. dr. Egidijus Kasiulis
	Reconstruction of Hydraulic Structures [HST6008]	Civil Engineering	6	60	100	Practical works, Seminar, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius
	Wastewater Treatment Technologies [HST6009]	Civil Engineering	6	60	100	Practical works,	prof. dr. Algirdas Radzevičius

						Laboratory works, Colloquium, Written exam	assoc. prof. dr. Midona Dapkienė
	Decision Support Systems For Water Management [HST6010]	Civil Engineering	6	60	100	Practical works, Seminars, Colloquium, Written exam	assoc. prof. dr. Egidijus Kasiulis
	Management of International Projects [HST6015]	Management	6	60	100	Individual work, Seminars, Colloquium, Written exam	assoc. prof. dr. Inga Adamonytė
	Inland Waterways Engineering [HST6013]	Civil Engineering	6	60	100	Individual work, Seminars, Colloquium, Written exam	lect. msc. Raimundas Baublys
	Technology of Drainage and Irrigation [HST6004]	Civil Engineering	6	60	100	Project preparation and presentation, Colloquium, Written exam	assoc. prof. dr. Inga Adamonytė
	Spatial Data Analysis [ZEM6002]	Information Systems	6	60	100	Practical works, Seminars, Colloquium, Written exam	lect. dr. Donatas Jonikavičius
	In total in the semester:		**18**	**124**	**356**		

	STUDY COURSES	STUDY FIELD	ECTS	Contact work hours	Independent work hours	The form of assessment	TEACHERS
V semester	*Compulsory:*						
	Research Work -2 [HST5010]	Civil Engineering	6	4	156	Defence	Supervisor of final thesis
	Elective (two subjects):						
	Restoration of Water Bodies [HST6005]	Civil Engineering	6	60	100	Practical works, Seminar, Colloquium, Written exam	lect. msc. Raimundas Baublys
	Environment Protection Structures [HST6003]	Civil Engineering	6	60	100	Individual work, Laboratory works, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius
	Modelling of Seepage [HST6006]	Civil Engineering	6	60	100	Individual work, Laboratory works, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius
	Water Power Plants [HST6007]	Civil Engineering	6	60	100	Practical works, Seminars, Colloquium, Written exam	assoc. prof. dr. Egidijus Kasiulis
	Reconstruction of Hydraulic Structures [HST6008]	Civil Engineering	6	60	100	Practical works, Seminar, Colloquium, Written exam	assoc. prof. dr. Raimondas Šadzevičius

	Wastewater Treatment Technologies [HST6009]	Civil Engineering	6	60	100	Practical works, Laboratory works, Colloquium, Written exam	prof. dr. Algirdas Radzevičius assoc. prof. dr. Midona Dapkienė
	Decision Support Systems For Water Management [HST6010]	Civil Engineering	6	60	100	Practical works, Seminars, Colloquium, Written exam	assoc. prof. dr. Egidijus Kasiulis
	Management of International Projects [HST6015]	Management	6	60	100	Individual work, Seminars, Colloquium, Written exam	assoc. prof. dr. Inga Adamonytė
	Inland Waterways Engineering [HST6013]	Civil Engineering	6	60	100	Individual work, Seminars, Colloquium, Written exam	lect. msc. Raimundas Baublys
	Technology of Drainage and Irrigation [HST6004]	Civil Engineering	6	60	100	Project preparation and presentation, Colloquium, Written exam	assoc. prof. dr. Inga Adamonytė
	Spatial Data Analysis [ZEM6002]	Information Systems	6	60	100	Practical works, Seminars, Colloquium, Written exam	lect. dr. Donatas Jonikavičius
	In total in the semester:		**18**	**124**	**356**		

	STUDY COURSES	STUDY FIELD	ECTS	Contact work hours	Independent work hours	The form of assessment	TEACHERS
IV semester	Final Work of Master Degree. [BENMHST01]	Civil Engineering	**30**	20	780	Final thesis defence in committee	Supervisor of final thesis
	In total in the semester:		**30**	20	780		

In total in the programme:		**120**
In total for the study field courses:		**96-108**
In total for the study courses of other study fields:		**12-24**
In total for final thesis:		**30**

LIST OF FINAL THESES

ANNEX 2

The second cycle study programme ***Hydraulic Engineering***

No.	The topic of the final thesis	The supervisor	The evaluation
2021			
1	Analysis of Water Losses and Reduction Measures in Telšiai Water Supply System	A. Radzevičius	8
2	Research of Concrete Plastifying Admixtures Efficiency Intended for the Lithuanian Market	R. Skominas	8
3	Influence of Wood Ash on Concrete Properties	R. Skominas	9
4	Improving Ecological Status of Kalviai Lake by the Removal of Macrophytes	A. Povilaitis	9
5	The Impact of Fisheries Farm on the Ecological Status of Lake Ilgis	V. Gurskis	8
6	Analysis of the Technical Condition of Dikes in the Burkšvai Polder in Klaipėda District	A. Rudzianskaitė	7
7	Operational Efficiency and Environmental Impact of Small Wastewater Treatment Plants in Ukmergė District	M. Dapkienė	7
8	Maintaining Navigable Depth with Groynes	A. Dumbrauskas	10
9	Analysis of Concrete Compressive Strength Methods by Investigations of Reinforced Concrete Water Towers	R. Šadzevičius	8
10	Analysis of Žemaičių Naumiestis Hydroscheme Technical State Changes	R. Šadzevičius	8
11	Analysis of Measures to Reduce Seepage of Žlibinai Earth Dam	R. Šadzevičius	9
12	Use of Ceramic Waste in Concrete Production	R. Skominas	9
13	Wastewater Treatment Efficiency of Kupiškis WWTP	A. Povilaitis	8
14	The Condition of Wastewater Treatment Plants in Small Settlements of Akmenė District and Possibilities of their Reconstruction	V. Gurskis	8
15	Analysis of Energy Recovery in Wastewater Network on the Left Bank of the Nemunas River in Kaunas City	P. Punys	10
16	Analysis of Hydropower Extraction Possibilities in Anykščiai Wastewater Treatment Plant	A. Radzevičius	8
17	Analysis of the Condition of Land Reclamation Ditches in Šakiai District	A. Kvaraciejus	6
2022			
1	Unconventional Hydropower in Sewage and Water Supply Distribution Network	P. Punys	8
2	Reclamation Structures in the Location and Georefin Data Comparative Analysis	A. Rudzianskaitė	10

3	Analysis of the Technical Condition of Hydroschemes in Telšiai Region	R. Skominas	8
4	The Impact of Funding on the Condition of Drainage Systems	V. Vaičiukynas	8
5	The Research of Parameters of Culverts on Road Išdagai - Naudžiai - Valakbūdis	M. Dapkienė	8
6	Impact of Defects on the Reliability of Building Structures	R. Skominas	9
7	Analysis of Nitrogen and Phosphorus Removal from Wastewater by Non-Reagent Methods	A. Radzevičius	9
8	Analysis of the Efficiency of Wastewater Treatment Plant and Sludge Utilization in Biržai Town Agglomeration	A. Povilaitis	9
9	State Road No. 206 Research on Strengthening Technologies	R. Šadzevičius	8
10	The Technical State of Culverts in Kretinga District	R. Šadzevičius	8
11	Water Levels and Their Change in the Inland Waterway E-41	A. Kvaraciejus	9
12	Analysis of the State of Reclamation Structures in Klaipėda District	R. Skominas	10
13	Effect of Irrigation System on Water use Efficiency and Usefulness of Fodder Crop Production in Nepal	A. Povilaitis	10
2023			
1	Analysis of the Technical State of Dams with Small Hydropower Plants in Lithuania	R. Šadzevičius	9
2	Possibilities of Hydropower Recovery in Sewage Networks	A. Radzevičius	8
3	The Influence of Soil Compaction to the Drainage System	I. Adamonytė	8
4	Evaluation of Hydrological Regime Restoration of Degėsiai Raised Bog: Analysis of Project Decisions and Monitoring Data	A. Povilaitis	8
5	Analysis of Surface Wastewater Management in Vilnius City	M. Dapkienė	9
6	Stability of Road Embankment Slopes in Weak Soils	R. Šadzevičius	9
7	The Importance of Engineering Geological Soil Investigations for the Efficiency of the Construction Process	R. Skominas	9
8	Forecasting Sediments of Wind Turbine Foundations and Modelling of Geofiltration Flow	M. Dapkienė	9
9	Analysis of Reconstruction Options for the Service Bridge in Šveicarija Hydroscheme	R. Šadzevičius	8
10	Optimization of Water Bodies Improvement (Cleaning) Works	R. Šadzevičius	9
11	Investigations on the Technical Condition of Squares and Sidewalks of Kupiškis City	V. Gurskis	7

12	Re-use of Concrete Waste in the Production of Aggregates for Normal Concrete	R. Skominas	9
13	The Investigation and Assessment of the Technical Condition of the Roud Culverts in the Molėtai District Municipality	V. Gurskis	8
14	Assessment of the Quality of Sludge Produced in Aquaculture Farms and Evaluation of it Use	G. Žibienė	9
15	Analysis of the Condition of Drainage Ditches and their Structures in Molėtai District	A. Kvaraciejus	10
2024			
1	Wastewater Sludge Characteristics and its Utilization Possibilities in LTD „Jurbarko vandenys”	A. Povilaitis	8
2	Assessment of the Condition of the Roads in the Akmenė District, Lithuania	A. Povilaitis	10
3	Technical State Analysis of Dams in Trakai District	R. Šadzevičius	8
4	Technical State Analysis of Hydraulic Structures in Viekšniai Mill	R. Šadzevičius	6
5	Creation of A Bim Environment for the Hydraulic Structures of Širvėna Lake	R. Skominas	10
6	Analysis of the Condition and Reconstruction Efficiency of Bridges in the Reclamation Structures Inventory of Rokiškis District	R. Skominas	10
7	Comparative Analysis of Drinking Water Filters	M. Dapkienė	9
8	Impact of Urbanisation in the Floodplain of the Nemunas River on the Flood Risk (on the Example of the Section from the Confluence of Nemunas and Neris Rivers to Virbaliūnai)	A. Kvaraciejus	9
9	Analysis of the Status and Future Perspectives of Reclamation Ditches in Kaunas District	A. Kvaraciejus	7
10	Analysis of the Technical Condition of Prefabricated Reinforced Concrete Bridges on the Roads of Local Significance in the Kaunas District	V. Gurskis	10
11	Analysis of Sustainable Composting of Sewage Sludge by JSC „Kaišiadorių vandenys“ Using Other Municipal Waste	A. Radzevičius	9
12	Feasibility Analysis of Reconstruction of Plungė Wastewater Treatment Plant	M. Dapkienė	10

ANNEX 3

LIST OF TEACHING STAFF OF THE FIELD COURSES

The second cycle study programme ***Hydraulic Engineering***

No	Surname, name	The pedagogical and/or scientific degree	The research interests and 3 major works over the last 5 years	The courses taught	The pedagogical work experience (years)	The practical work experience in the course field (years)	The current workload at the HEI
1.	Adamonytė Inga	assoc. prof. dr.	T002, T004 Drainage technologies 1. Maja Radziemska, Mariusz Zygmunt Gusiatin, Zbigniew Mazur, Algirdas Radzevičius, Agnieszka Bęś, Raimondas Šadzevičius, Jiri Holatko, Midona Dapkienė, **Inga Adamonytė** and Martin Brtnicky. Composite Biochar with Municipal Sewage Sludge Compost—A New Approach to Phytostabilization of PTE Industrially Contaminated Soils. // Energies. Basel: MDPI AG. 2023, 16(4), 1778; Science Citation Index Expanded (Web of Science); Scopus; Current Contents / Engineering, Computing & Technology. [20.500.12259/247798] [2023] [S1] [WOS => title: Energies, if: 3.2, 2022, quartile: Q1] 2. Marcinkevičienė, Aušra ; Velička, Rimantas ; Kosteckas, Robertas ; Rudinskienė, Aušra ; **Adamonytė, Inga** ; Kriaučiūnienė, Zita . Effects of nitrogen rates on the productivity and nutritive value of forage grass grown under extreme climatic conditions // Agronomy-Basel. Basel : MDPI AG, 2021, vol. 11 iss. 12, p. 1-13, ISSN 2073-4395. doi:10.3390/agronomy11122572. Science Citation Index Expanded (Web of Science); Current Contents / Agriculture, Biology and Environmental Sciences; Scopus. [20.500.12259/146487] [2021] [A001] [S1] [WOS => title: Agronomy-Basel, if: 3.949, aif: 3.852, aif_min: 3.478, aif_max: 4.226, cat: 2, av: 0.989, year: 2021, quartile: Q1] 3. Šadzevičius, Raimondas ; **Adamonytė, Inga** ; Gabryś, Katarzyna; Kucharski, Michał. Main physical-mechanic properties of concrete samples taken from Bražuolė – first removed dam in Lithuania // Acta Scientiarum Polonorum Architectura, 2022, t. 20, nr. 4,	Research Methodology; Management of Investment Projects; Management of International Projects; Technology of Drainage and Irrigation	26	9	1,0

			p. 11 - 19, ISSN 1644-0633, 2544-1760. doi:10.22630/ASPA.2021.20.4.30. < https://hdl.handle.net/20.500.12259/245768 > < 10.22630/ASPA.2021.20.4.30 >. Index Copernicus. [20.500.12259/245768] [2022] [T004] [S4] [ai: 0.354, iai: 0.354, na: 4, nia :2, nip: 1, pai: 0.354, piai: 0.354, al: 0.643]				
2.	Baublys Raimundas	lect. msc.	T002, T004; Rivers, Rivers Morphology, Hydrology; 1. Klimašauskas, Mindaugas; Šaulys, Valentinas; **Baublys, Raimundas**; Survilė, Oksana. Hydraulic conductivity of drainage ditch backfill with a lime additive in clay soils // Environmental engineering and management journal. Iasi: Gheorghe Asachi Technical University of Iasi. ISSN 1582-9596, 2020, Vol. 19, iss. 3, p. 497-504. Science Citation Index Expanded (Web of Science); IndexCopernicus; Environment Complete (EBSCO); Scopus. [20.500.12259/108574] [2020] [S1] [WOS => title: Environmental Engineering and Management Journal, if: 1.186, aif: 3.98, aif_min: 3.98, aif_max: 3.98, cat: 1, av: 0.298, year: 2018, quartile: Q4] [SCOPUS => title: Environmental Engineering and Management Journal, citescore: 1.03, snip: 0.902, sjr: 0.345, year: 2018, quartile: Q3] [ai: 0,5, iai: 0,25, na: 4, nia :2, nip: 0, pai: 0,798, piai: 0,399, al: 0.571]. 2.Zaborowski, Stanisław; Wicher-Dysarz, Joanna; Walczak, Natalia; Nieć, Jakub; **Baublys, Raimundas**. Application of physical and numerical modeling for determination of waterway safety under the bridge in Kaunas City, Lithuania // Water, 2023, t. 15, nr. 4, p. 1 - 23, ISSN 2073-4441. doi:10.3390/w15040731. Science Citation Index Expanded (Web of Science); Current Contents (Agriculture, Biology and Environmental Sciences); Scopus. [20.500.12259/249516] [2023] [T004] [S1] [WOS => title: Water, if: 3.53, aif: 5.381, aif_min: 4.453, aif_max: 6.309, cat: 2, av: 0.622, year: 2021, quartile: Q2] 3.Jurevičius, Linas ; **Baublys, Raimundas** . Using remote survey methods for ecologically sustainable water management of the large hydropower plant (HPP) reservoir // HIC 2022 : 14th International conference on hydroinformatics water INFLUENCE − Water INFormatic soLUtions and opEN problems in the cycle from Clouds to ocEan 4-8 July 2022, Bucharest, Romania, 2022, p. 1 - 4. Prieiga per internetą: < https://hdl.handle.net/20.500.12259/246234 >. [20.500.12259/246234] [2022] [T004] [P1d] [ai: 0.5, iai: 0.5, na: 2, nia :2, nip: 0, pai: 0.5, piai: 0.5, al: 0.286]	Restoration of Water Bodies; Inland Waterways Engineering	17	17	0,5
3.	Dapkienė Midona	assoc. prof. dr.	T002, T004, Wastewater Treatment Technologies; Assessment of status of water bodies; 1. Maja Radziemska, Mariusz Zygmunt Gusiatin, Zbigniew Mazur, Algirdas Radzevičius, Agnieszka Bęś, Raimondas Šadzevičius, Jiri Holatko, **Midona Dapkienė,** Inga	Wastewater Treatment Technologies,	23	7	0,85

			Adamonytė and Martin Brtnicky. Composite Biochar with Municipal Sewage Sludge Compost—A New Approach to Phytostabilization of PTE Industrially Contaminated Soils. // Energies. Basel: MDPI AG. 2023, 16(4), 1778; Science Citation Index Expanded (Web of Science); Scopus; Current Contents / Engineering, Computing & Technology. [20.500.12259/247798] [2023] [S1] [WOS => title: Energies, if: 3.2, 2022, quartile: Q1] 2. Česonienė, Laima; **Dapkienė, Midona**; Punys, Petras. Assessment of the impact of small hydropower plants on the ecological status indicators of water bodies: a case study in Lithuania // Water. Basel : MDPI. ISSN 2073-4441, 2021, vol. 13, iss. 4, p. 1-24. doi:10.3390/w13040433. Science Citation Index Expanded (Web of Science); Current Contents (Agriculture, Biology & Environmental Sciences); Scopus. [WOS => title: Water, if: 2.544, aif: 2.886, aif_min: 2.886, aif_max: 2.886, cat: 1, av: 0.881, year: 2019, quartile: Q2] [SCOPUS => title: Water (Switzerland), citescore: 3, snip: 1.074, sjr: 0.657, year: 2019, quartile: Q2]. 3. Česonienė, Laima; Šileikienė, Daiva; **Dapkienė, Midona**. Influence of anthropogenic load in river basins on river water status: a case study in Lithuania // Land. Basel : MDPI AG, 2021, vol. 10, iss. 12, 2021, p. 1-16, ISSN 2073-445X. doi:10.3390/land10121312. Social Sciences Citation Index (Web of Science); Current Contents / Social and Behavioral Sciences; Scopus. [20.500.12259/146028] [2021] [N012] [S1] [WOS => title: Land, if: 3.905, aif: 5.013, aif_min: 5.013, aif_max: 5.013, cat: 1, av: 0.779, year: 2021, quartile: Q2]	Reliability of Hydraulic Structures			
4.	Jonikavičius Donatas	lect.dr.	T004, A004 Remote Sensing in Evironmental Engineering, Agriculture and Forestry; Geographic information systems 1. Juknelienė, Daiva ; Česonienė, Laima ; **Jonikavičius, Donatas** ; Šileikienė, Daiva ; Tiškutė-Memgaudienė, Daiva ; Valčiukienė, Jolanta ; Mozgeris, Gintautas . Development of land cover naturalness in Lithuania on the edge of the 21st century: trends and driving factors // Land. Basel : MDPI, 2022, t. 11, nr. 3, p. 1 - 20, ISSN 2073-445X. doi:10.3390/land11030339.. Social Sciences Citation Index (Web of Science), year: 2022, quartile: Q2] 2. Forzier, Giovanni; Pecchi, Matteo; Girardello, Marco; Mauri, Achill; Klaus, Marcus; Nikolov, Christo; Ruetschi, Marius; Gardiner, Barry; Tomaštík, Julián; Small, David; Nistor, Constantin; **Jonikavičius, Donatas** ; Spinoni, Jonathan; Feyen, Luc; Giannetti, Francesca; Comino, Rinaldo; Wolynski, Alessandro; Pirotti, Francesco; Maistrelli, Fabio; Savulescu, Ionut; Wurpillot-Lucas, Stephanie; Karlsson, Stefan; Zieba-Kulawik,	Spatial Data Analysis	7	10	0,9

			Karolina; Strejczek-Jazwinska, Paulina; Mokroš, Martin; Franz, Stefan; Krejci, Lukas; Haidu, Ionel; Nilsson, Mats; Wezyk, Piotr; Catani, Filippo; Chen, Yi-Ying; Luyssaert, Sebastiaan; Chirici, Gherardo; Cescatti, Alessandro; Beck, Pieter S. A. A spatially explicit database of wind disturbancesin European forests over the period 2000–2018 // Earth system science data. Göttingen : Copernicus Gesellschaft mbH, 2020, vol.12, iss. 1, p. 257–276, ISSN 1866-3508. doi:10.5194/essd-12-257-2020. Science Citation Index Expanded (Web of Science); year: 2020, quartile: Q1] 3.**Jonikavičius, Donatas** ; Mozgeris, Gintautas ; Juodkienė, Vytautė; Stravinskas, Henrikas; Tebėra, Albinas. Detection of early stage bark beetle infestations in spruce stands using multitemporal low cost hyperspectral imaging // Brazilian journal of forestry research. Colombo : Embrapa Florestas, 2019, vol. 39, spec. iss, p. 380-380, ISSN 1809-3647. < http://iufro2019.com/wp-content/uploads/2019/10/Anais_Iufro_Final_reduzido-1.pdf >				
5.	Gurskis Vincas	assoc. prof. dr.	T002, Building Materials and Structures, Construction Law; 1. Borg, Ruben Paul; Vaičiukynienė, Danutė; **Gurskis, Vincas;** Nizevičienė, Dalia; Skominas, Rytis; Ramukevičius, Dainius; Šadzevičius, Raimondas. Alkali-activated material based on red clay and silica gel waste // Waste and biomass valorization. Dordrecht : Springer. ISSN 1877-2641, 2020, vol. 11, iss. 6, p. 2973–2982. doi:10.1007/s12649-018-00559-9. Expanded (Web of Science); SpringerLINK; Ingenta Connect; Scopus; CAB Abstracts. [20.500.12259/99922] [2020] [S1] [WOS => title: Waste and Biomass Valorization, if: 3.703, aif: 5.201, aif_min: 5.201, aif_max: 5.201, cat: 1, av: 0.712, year: 2020, quartile: Q2] 2. **Gurskis, Vincas;** Skominas, Rytis; Šadzevičius, Raimondas. Multi-criteria comparative analysis of water-supply and sewerage pipes manufactured from different materials // Rural development 2021 : challenges for sustainable bioeconomy and climate change [elektroninis išteklius] : proceedings of the 10th international scientific conference, 21-23 September, 2021, Vytautas Magnus University Agriculture Academy, Lithuania. 2021, t. 2021, nr. 1, p. 80 - 86, ISSN 1822-3230, 2345-0916. doi:10.15544/RD.2021.014. 3. Šadzevičius, Raimondas; Gurskis, Vincas; Ramukevičius, Dainius. Research on the properties of concrete with hemp shives // Construction of optimized energy potential = Budownictwo o zoptymalizowanym potencjale energetycznym, 2023, nr. 12, p. 25 - 32, ISSN 2544-963X, 2299-8535. doi:10.17512/bozpe.2023.12.03. <	Building Legal Regulation	22	7	0,6

			10.17512/bozpe.2023.12.03 >. Index Copernicus; BazTech. [20.500.12259/253850] [2023] [S4] [ai: 0.333, na: 3, nia: 3, nip: 0, pai: 0.333].				
6.	Kasiulis Egidijus	assoc. prof. dr.	T002; Coventional and Hydrokinetic Energy Conversion and its Impact on Environment, Sustainable Water Management 1. Jurasz, Jakub; Tomczyk, Paweł; Bochenek, Bogdan; Kuriqi, Alban; **Kasiulis, Egidijus** ; Chen, Diyi; Ming, Bo. Solar-hydro cable pooling – Utilizing the untapped potential of existing grid infrastructure // Energy conversion and management, 2024, t. 306, p. 1 - 13, ISSN 0196-8904, 1879-2227. doi:10.1016/j.enconman.2024.118307. [WOS => title: ENERGY CONVERSION AND MANAGEMENT, if: 10.4, aif: 5.6, aif_min: 4.3, aif_max: 7.4, cat: 3, av: 1.962, year: 2022, quartile: Q1] 2. Jurevičius, Linas ; Punys, Petras ; Šadzevičius, Raimondas ; **Kasiulis, Egidijus**. Monitoring dewatering fish spawning sites in the reservoir of a large hydropower plant in a lowland country using unmanned aerial vehicles // Sensors, 2023, t. 23, nr. 1, p. 1 - 19, ISSN 1424-8220. doi:10.3390/s23010303. [WOS => title: SENSORS, if: 3.9, aif: 4.333, aif_min: 4.1, aif_max: 4.5, cat: 3, av: 0.892, year: 2022, quartile: Q2] 3.Quaranta, Emanuele; Bodis, Katalin; **Kasiulis, Egidijus**; Mcnabola, Aonghus; Pistocchi, Alberto. Is there a residual and hidden potential for small and micro hydropower in Europe? A screening-level regional assessment // Water resources management, 2022, t. 36, nr. 6, p. 1745 - 1762, ISSN 0920-4741, 1573-1650. doi:10.1007/s11269-022-03084-6. [WOS => title: WATER RESOURCES MANAGEMENT, if: 4.3, aif: 4.55, aif_min: 4.4, aif_max: 4.7, cat: 2, av: 0.941, year: 2022, quartile: Q1]	Urban Water Management; , Water Power Plants, Decision Support Systems For Water Management	5	7	0,55
7.	Kvaraciejus Algis	assoc. prof. dr.	T002 Sustainable Water Resources Management (Hydropower, Restoration of Lakes and Wetlands, and Multi-criteria Analysis) 1. Punys, Petras ; Vyčienė, Gitana ; Jurevičius, Linas ; **Kvaraciejus, Algis** . Small hydropower assessment of Uganda based on multisource geospatial data // Water, 2023, t. 15, nr. 11, p. 1 - 20, ISSN 2073-4441. doi:10.3390/w15112051. 2.Kasiulis, Egidijus ; Punys, Petras ; **Kvaraciejus, Algis** ; Dumbrauskas, Antanas ; Jurevičius, Linas . Small hydropower in the Baltic States - current status and potential for future development // Energies. Basel : MDPI AG, 2020, vol. 13, iss. 24, 2020, p. 1-21, ISSN 1996-1073. doi:10.3390/en13246731. 3. Punys, Petras ; Radzevičius, Algirdas ; **Kvaraciejus, Algis** ; Gasiūnas, Valerijus ; Šilinis, Linas . A multi-criteria analysis for siting surface-flow constructed wetlands in tile-drained agricultural catchments: the case of Lithuania // Agricultural water management.	Hydrologic Modelling System	23	9	1,0

			Amsterdam : Elsevier Science, 2019, vol. 213, iss. 1, 2019, p. 1036-1046, ISSN 0378-3774. doi:10.1016/j.agwat.2018.12.020				
8.	Miseckaitė Otilija	Lect. msc.	T004, T002; Environmental Impact of Drainage; Application of Biotechnology in Drainage and Irrigation Systems; 1. **Miseckaitė, Otilija**. Impact of climate change on the hydrological changes of subsurface drainage // Proceedings of International congress and workshop on agricultural structures and irrigatioon, 12-15 May, 2022, Diyarbakr, Turkiy, 2022. Prieiga per internetą: < https://hdl.handle.net/20.500.12259/241037 >. 2. **Miseckaitė, Otilija**. Water and soil environmental risk assessment in Lithuania // Contaminated sites 2022 : international conference, Senec, Slovak Republic, 12–14 October 2022, 2022, p. 32 - 35, ISBN 9788082130846. Prieiga per internetą: < https://hdl.handle.net/20.500.12259/244446 >. 3. **Miseckaitė, Otilija**. Agricultural contamination // Water scarcity, contamination and management / editors: A. Tiwari, A. Kumar, A. Singh, T.N. Singh, E. Suozzi, G. Matta, S. Russo, 2022, t. 5, p. 1 - 6, ISBN 9780323853781, 9780323903219, ISSN 2542-7946. Prieiga per internetą: < https://hdl.handle.net/20.500.12259/241043 >	Technology of Drainage and Irrigation	7	7	0,5
9.	Povilaitis Arvydas	prof. (HP), dr.	T004, T002; Sustainability of Aquatic Ecosystems. Research on Water Balance and Quality Parameters. Application of Biotechnology in Drainage Systems; 1. Plunge, S., Gudas, M. and **Povilaitis, A**., 2022. Effectiveness of best management practices for non-point source agricultural water pollution control with changing climate–Lithuania's case. Agricultural Water Management, 267, p.107635. (Q1). 2. **Povilaitis, Arvydas;** Matikienė, Jolanta; Vismontienė, Rasa. Effects of three types of amendments in woodchip-denitrifying bioreactors for tile drainage water treatment // Ecological engineering. Amsterdam : Elsevier Science, 2020, vol. 158., doi:10.1016/j.ecoleng.2020.106054 (Q1) 3. **Povilaitis, Arvydas**; Matikienė, Jolanta. Nitrate removal from tile drainage water: The performance of denitrifying woodchip bioreactors amended with activated carbon and flaxseed cake // Agricultural water management. Amsterdam : Elsevier Science, 2020, vol. 229. ISSN 0378-3774, doi:10.1016/j.agwat.2019.105937. (Q1)	Restoration of Disturbed Water Ecosystems; Research Methodology	32	25	0,6
10.	Punys Petras	prof. (HP) dr.	T002; Enginering Hydrology, Hydropower;	Hydrologic Modelling System,	38	10	0,5

			1**. Punys, P**.; Jurevičius, L.; Balčiūnas, A. HYPOSO Map Viewer: A Web-Based Atlas of Small-Scale Hydropower for Selected African and Latin American Countries. Water 2024, 16, 1276. https://doi.org/10.3390/w16091276 Q2 2. **Punys, Petras;** Kvaraciejus, Algis; Dumbrauskas, Antanas; Šilinis, Linas; Popa, Bogdan. An assessment of micro-hydropower potential at historic watermill, weir, and non-powered dam sites in selected EU countries // Renewable energy. Oxford : Elsevier Ltd. ISSN 0960-1481, 2019, vol. 133, p. 1108-1123. doi:10.1016/j.renene.2018.10.086; Q1 3. **Punys, Petras** ; Radzevičius, Algirdas ; Kvaraciejus, Algis ; Gasiūnas, Valerijus ; Šilinis, Linas . A multi-criteria analysis for siting surface-flow constructed wetlands in tile-drained agricultural catchments: the case of Lithuania // Agricultural water management. Amsterdam : Elsevier Science. ISSN 0378-3774, 2019, vol. 213, iss. 1, p. 1036-1046. doi:10.1016/j.agwat.2018.12.020; Q1	Decision Support Systems For Water Management			
11.	Radzevičius Algirdas	prof., dr.	T002,T004 Application of Nano and Other Technologies in Water Management and Construction Processes. Development of Innovative Wastewater Treatment Technologies; 1. Maja Radziemska, Mariusz Zygmunt Gusiatin, Zbigniew Mazur, **Algirdas Radzevičius**, Agnieszka Bęś, Raimondas Šadzevičius, Jiri Holatko, Midona Dapkienė, Inga Adamonytė and Martin Brtnicky. Composite Biochar with Municipal Sewage Sludge Compost—A New Approach to Phytostabilization of PTE Industrially Contaminated Soils. // Energies. Basel: MDPI AG. 2023, 16(4), 1778; Science Citation Index Expanded (Web of Science); Scopus; Current Contents / Engineering, Computing & Technology. [20.500.12259/247798] [2023] [S1] [WOS => title: Energies, if: 3.2, 2022,Q1] 2.Gabryś, Katarzyna; **Radzevičius, Algirdas** ; Szymański, Alojzy; Šadzevičius, Raimondas. Shear strength characteristics of recycled concrete aggregate and recycled tire waste mixtures from monotonic triaxial tests // Materials. Basel: MDPI AG. ISSN 1996-1944, 2022, vol. 14, iss. 23, p. 1-17. doi:10.3390/ma14237400. Science Citation Index Expanded (Web of Science); Current Contents (Engineering, Computing & Technology). [20.500.12259/146166] [2021] [S1] [WOS => title: Materials, if: 3.623, Q1] 3. Vaičiukynienė, Danutė; **Radzevičius, Algirdas;** Mikelionienė, Agnė; Kantautas, Aras; Bajare, Diana. The influence of zeolitic by-product containing ammonium ions on properties of hardened cement paste“. Journal of Minerals Basel : MDPI. ISSN 2075-163X. 2021, vol. 11, iss. 2, art. no. 123, p. 1-11. DOI: 10.3390/min11020123. Science Citation Index Expanded (WOS)Q2	Wastewater Treatment Technologies;	40	18	0,95

12.	Ramukevičius Dainius	lect. msc.	T002; The Evaluation of Technical State of Hydraulic Structures and Agricultural Buildings, Research of Local Rational Materials and Structures, 1.Gabryś, Katarzyna; Šadzevičius, Raimondas ; Dapkienė, Midona; **Ramukevičius, Dainius** ; Sas, Wojciech. Effect of a fine fraction on dynamic properties of recycled concrete aggregate as a special anthropogenic soil // Materials, 2023, t. 16, nr. 14, p. 1 - 22, ISSN 1996-1944. doi:10.3390/ma16144986. [WOS => title: Materials, if: 3.4, aif: 6.02, aif_min: 4.4, aif_max: 7.5, cat: 5, av: 0.566, year: 2022, quartile: Q2] [SCOPUS => title: Materials, citescore: 5.2, snip: 1.067, sjr: 0.563, year: 2022, quartile: Q2] 2.Kielė, Andrius; Vaičiukynienė, Danutė ; Bertašius, Šarūnas; Krivenko, Pavel; Bistrickaitė, Rėda; Jocius, Vytautas; **Ramukevičius, Dainius** . Alkali-activated slag coatings for fire protection of OPC concrete // Materials, 2023, t. 16, nr. 23, p. 1 - 15, ISSN 1996-1944. doi:10.3390/ma16237477. [T004] [S1] [WOS => title: Materials, if: 3.4, aif: 6.02, aif_min: 4.4, aif_max: 7.5, cat: 5, av: 0.566, year: Aplinkosaugos statiniai 21 9 0,72022, quartile: Q2] 3.Borg, Ruben Paul; Vaičiukynienė, Danutė; Gurskis, Vincas; Nizevičienė, Dalia; Skominas, Rytis; **Ramukevičius, Dainius;** Šadzevičius, Raimondas. Alkali-activated material based on red clay and silica gel waste // Waste and biomass valorization. Dordrecht : Springer. ISSN 1877-2641, 2020, vol. 11, iss. 6, p. 2973–2982. doi:10.1007/s12649-018-00559-9. [WOS => title: Waste and Biomass Valorization, if: 3.703, aif: 5.201, aif_min: 5.201, aif_max: 5.201, cat: 1, av: 0.712, year: 2020, quartile: Q2]	Environment Protection Structures	21	9	0,7
13.	Skominas Rytis	assoc. prof. dr.	T002; Reliability and Longevity of Hydraulic Structures, the Use of Waste in Concrete (Green Concrete); 1. Sas, W., Dzięcioł, J., Radzevičius, A., Radziemska, M., Dapkienė, M., Šadzevičius, R., **Skominas R.,** Głuchowski A. (2021). Geotechnical and environmental assessment of blast furnace slag for engineering applications. Materials, 14(20), 1-13. doi: 10.3390/ma14206029. Science Citation Index Expanded (Web of Science); Current Contents (Engineering, Computing & Technology); Scopus. [20.500.12259/145353] [2021] [S1] [WOS => title: Materials, if: 3.623, aif: 5.679, aif_min: 3.615, aif_max: 7.254, cat: 5, av: 0.642, year: 2020, Q1] 2. Głuchowski, A., Šadzevičius, R., **Skominas, R.,** & Sas, W. (2021). Compacted anthropogenic materials as backfill for buried pipes. Materials, 14(4), 1-19. Science	Reliability of Hydraulic Structures, Building Legal Regulation	16	16	1,0

			Citation Index Expanded (Web of Science); Current Contents (Engineering, Computing & Technology); [WOS => title: Materials, if: 3.623, year: 2020, quartile: Q1] 3. Gjunsburgs, B.; Radzevičius, A.; Šadzevičius R.; **Skominas R**. Scours evolution at bridge abutments under unsteady flow events. Iranian journal of science and technology, transactions of civil engineering Cham : Springer international publishing AG, 2020.				
14.	Šadzevičius Raimondas	assoc. prof. dr.	T002; The Evaluation of Technical State of Hydraulic Structures and Agricultural Buildings, Research of Local Rational Materials and Structures, Witkowska-Dobrev, Joanna; Szlachetka, Olga; Francke, Barbara; Chyliński, Filip; Małek, Marcin; **Šadzevičius, Raimondas;** Ramukevičius, Dainius; Frąk, Magdalena; Dzięcioł, Justyna; Kruszewski, Mirosław; Klimek, Agnieszka; Dohojda, Marek; Sas, Wojciech. Effect of different water-cement ratios on the durability of prefabricated concrete tanks exposed to acetic acid aggression // Journal of building engineering, 2023, t. 78, p. 1 - 15, ISSN 2352-7102. doi:10.1016/j.jobe.2023.107712. Science Citation Index Expanded (Web of Science); Scopus. [20.500.12259/256620] [2023] [S1] [WOS => title: Journal of Building Engineering, if: 6.4, aif: 5.15, aif_min: 4.7, aif_max: 5.6, cat: 2, av: 1.29, year: 2022, quartile: Q1] 2. Soból, Emil; Gabryś, Katarzyna; Zabłocka, Karina; **Šadzevičius, Raimondas**; Skominas, Rytis ; Sas, Wojciech. Laboratory studies of small strain stiffness and modulus degradation of Warsaw mineral cohesive soils // Minerals. Basel : MDPI, 2020, vol. 10, iss. 12, 2020, p. 1-19, ISSN 2075-163X. doi:10.3390/min10121127. Science Citation Index Expanded (Web of Science); [WOS => title: Minerals, if: 2.644, aif: 3.175, aif_min: 2.997, aif_max: 3.273, cat: 3, av: 0.82, year: 2020, quartile: Q2] 3.Głuchowski, Artur; Gabryś, Katarzyna; Soból, Emil; **Šadzevičius, Raimondas** ; Sas, Wojciech. Geotechnical properties of anthropogenic soils in road engineering // Sustainability. Basel : MDPI AG, 2020, vol. 12, iss. 12, 2020, p. 1-25, ISSN 2071-1050. doi:10.3390/su12124843. Social Sciences Citation Index (Web of Science); [WOS => title: Sustainability, if: 3.251, aif: 4.78, aif_min: 4.359, aif_max: 5.201, cat: 2, av: 0.663, year: 2020, quartile: Q2]	Design of Hydraulic Structures, Building Information Modeling (BIM), Environment Protection Structures; Modelling of Seepage; Reconstruction of Hydraulic Structures	13	9	0,8
15.	Žibienė Gražina	assoc. prof. dr.	T002, The Evaluation of Technical State of Hydraulic Structures, Environmental Impact Assessment, Aquaculture technologies; 1. **Žibienė, Gražina;** Žibas, Alvydas. 2019. Impact of Commercial Probiotics on Growth Parameters of European Catfish (*Silurus glanis*) and Water Quality in Recirculating Aqauculture Systems. Aquaculture International. DOI: 10.1007/s10499-019-00428-9.	Optimization of water supply and sewer systems, Design of Hydraulic	25	23	1,0

			2. **Žibienė, Gražina;** Žibas, Alvydas. 2019. The Use of Zeolite for Water Quality Management in Cold Water Recirculation Aquaculture Systems // Rural Development-2019/ Vytautas Magnus University. 2019. http://doi.org/10.15544/RD.2019.018. 3. **Žibienė, Gražina**; Česonienė, Laima; Žibas, Alvydas; Brazauskas, Mantas. nfluence of different fertilizers on the water quality of aquaculture ponds // AgoEco 2024/ Vytautas Magnus University. 2024.	Structures, Building Information Modeling (BIM)			

Research fields: T002 – Civil Engineering, T004 – Environmental Engineering, A004 – Forestry.

ANNEX 4

MAIN LIST OF PROJECTS CARRIED OUT BY TEACHERS

International projects

1. HORIZON 2020: Hydropower solutions for developing and emerging countries (HYPOSO), 2019-2023;
2. HORIZON EUROPE: New governance models to enhance nutrient pollution handling and nutrient recycling (NENUPHAR), 2023-2027;
3. HORIZON EUROPE: PRocess Innovations for the Mineral industry focusing on ROasting and Calcination Kiln technologies and supported by novel pre- and post-processing (PRIM-ROCK), 2024-2028;
4. HORIZON EUROPE: Geothermal Extraction and Upgrade with Flexible Usage for Industrial Heat Applications (GEOFLEXHEAT), 2024-2027;
5. HORIZON EUROPE: Streamlining the optimisation of Sustainable Thermal Energy systems and Prototype technologies in process industries (StreamSTEP), 2024-2028;
6. LIFE: Boosting the sustainability of the urban water cycle: energy harvest in water industry using micro-hydropower technology (LIFE NEXUS), 2018-2023;
7. LIFE: Green Farm for Life (GFarm), 2023-2026;
8. INTERREG: Renewable Energies in European Water Mills, 2024-2028;
9. NAWA: Stronger Together – Strategic partnerships of the University of Silesia in Katowice within the Transform4Europe network, 2022-2024;
10. COST: Pan-European Network for Sustainable Hydropower, 2022-2026;
11. Climate adapted agriculture – Baltic Agrifuture, 2020-2021;
12. Solution Proposal for Education-Job Mismatch Within European Region by Using Artificial Intelligence Algorithms EMLT + AI, 2022-2025.
13. Erasmus+ Nr. 2023-1-LT01-KA220-HED-000154247 „The Digital Blue Carrier for a Post-Carbon Future - Curriculum Innovations in Aquaculture“, 2023;
14. Nordplus Higher Education project ID NPHE-2023/10516 SUKACKO - „Education for Sustainable Water Bodies and Coasts“, 2023;

National projects

15. Studies on Silting of Drainage Systems, 2019-2021;
16. Renewable Energy, Sustainable Construction and "Smart Barn" Principles in Agricultural Buildings, 2019-2022;
17. Research of Geosynthetics, 2021; Improving the Technology for the Practical Use of Geotextile Knitted Sock Liners, 2019-2021,
18. Development of Models for Sustainable Dairy Farms, Scientific and Economic Justification of Recommended Solutions, 2019-2020;
19. Smart Controlled Drainage System, 2020-2021;
20. Research on the Effectiveness of Bioenergy LT Probiotics in Wastewater Treatment Processes, 2021;
21. Establishment of Criteria and Development of a Methodology for Determining the Most Suitable Hydrological Drought Indicator for Natural and Catastrophic Hydrological Phenomena in Lithuania, 2021-2022;
22. Study on the Ecological and Socio-Economic Assessment of Dams, 2021-2022;

23. Research on the Condition Assessment, Reconstruction, or Renaturalization Possibilities of Abandoned Hydraulic Structures, 2022-2025;
24. Development of Recommendations for Innovative Solutions to Reduce the use of Natural Resources in Aquaculture and the Use of Sludge from Aquaculture Ponds and Closed Aquaculture Systems, 2022-2023;
25. RB3-0402 Neris bridge 19.4 – 21.1 km (1.51 km) monitoring of environmental impacts during construction, 2022-2025;
26. European Innovation Partnership Operational Group Project 'Utilization of Organic Carbon for the Development of Ecosystem Services by Adapting Farming to Climate Change', 2023-2025;
27. Assessment of the Technical Condition of the Vaitiekūnai Hydraulic Structures on the Šušvė River in the Radviliškis District, 2023;
28. European Innovation Partnership Operational Group Project 'Sustainable Agriculture – Sustainable Soil and Plant-Based Resources' 2023-2025;
29. Recommendations on Technological Standards for Fish Farming in Aquaculture Ponds and Closed Systems, 2023;
30. Feasibility Study on the Use of Areas with Non-operational Drainage Systems, 2024-2026.