APPLICATION

Study field "Environmental Protection" for assessment

Study field	*Environmental Protection*
Title of the higher education institution	*Latvijas Universitāte*
Registration code	*3341000218*
Legal address	*RAIŅA BULVĀRIS 19, CENTRA RAJONS, RĪGA, LV-1050*
Phone number	*67034301*
E-mail	*lu@lu.lv*

Self-evaluation report

Study field "Environmental Protection"

University of Latvia

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1. Information on the Higher Education Institution/College

1.1. Basic information on the higher education institution/ college and its strategic development fields,.

University of Latvia (hereinafter – UL) was founded in 1919 and is the only classical university in Latvia. The University of Latvia is a university of science, incorporating and developing the country's main study and scientific research potential in the field of humanities, natural, technical, and social sciences. UL serves science and fatherland. By participating in worldwide research and educational processes, it contributes to the growth and sustainability of the Latvian state and nation. UL retains its status as the largest higher education institution (hereinafter – HEI) in the country in terms of the number of students.

Mission: The mission of the UL is expressed in its motto “For Science and Fatherland”. The UL contributes to global science, higher education, knowledge, technology transfer and innovation, and ensures the growth of Latvian democracy and culture, the development of the Latvian language and the prosperity of the national economy.

Vision: Space for excellence, environment for development, time for responsibility. The UL is a university of science of high international standing. The UL creates an interdisciplinary, open, and innovation oriented excellent work and study environment. Activities of the UL form the basis for the sustainable development and economic transformation of Latvia.

Values:

- University community;
- Excellence;
- Science-based development;
- Openness;
- Cooperation;
- Academic freedom.

UL plays a significant role not only in the development of the higher education system in Latvia, but also in the growth of the country's economy, providing cutting edge studies and research, based on the unity of higher education and science. The UL actively participates in solving topical problems of the state and society, and is the centre of intellectual life in Latvia, where new knowledge is created, while nurturing the national language, culture and promoting the development of the state and society. The UL focuses its efforts on providing quality studies and developing scientific excellence, creating structures open to interdisciplinary and transdisciplinary research and studies, ensuring a high return on invested resources, sustainable and environmentally friendly use of resources. The UL is evolving as a modern international academic centre, creating an environment and infrastructure for excellence in studies, research, and innovation.

The study process at the UL is implemented at 13 faculties, 7 regional branches (available only in Latvian) and 3 medical colleges. Research activities are also performed at 18 research institutes, and various research, training and consulting activities are conducted in 27 study centres. The UL Regional Centre (available only in Latvian) coordinates and supervises the activities of the UL regional branches, as well as promotes cooperation between the UL and local authorities in the fields of human resources development, education and interdisciplinary research. The UL has more than 200 bilateral cooperation agreements with universities in 51 countries. The UL Culture Centre

(available only in Latvian) is represented by more than 20 amateur arts groups – choirs, dance groups, vocal ensembles, early music ensembles, theatre, a brass band, and a ceramics studio. The UL Sports Centre organises UL sports activities for up to 40 different sports classes in 11 sports – basketball, wrestling, group fitness classes, football, floorball, table tennis, kendo, general fitness, volleyball, cheerleading and self-defence. Within the UL regular activities are also performed by basic structural units: Museum of the UL, the UL Botanical Garden, the UL Experimental Rhododendron Breeding Nursery "Babīte", the University of Latvia Press, and the UL Baldone Observatory (available only in Latvian). The UL foundations are also operating successfully: UL Foundation and the Alumni Club (available only in Latvian).

To implement structural changes at the UL and promote interdisciplinarity, on November 16, 2023, the UL Council supported the Rector's Consolidation proposal for a five-faculty model, which includes 29 UL academic institutions. The new five-faculty model will consist of UL's Faculty of Medicine, Natural Sciences, Mathematics and Computing; Faculty of Economics and Social Sciences; Faculty of Humanities; Faculty of Educational Sciences and Psychology; and the Faculty of Law. **The Faculty of Medicine, Natural Sciences, Mathematics and Computing** will include the Faculty of Biology, Faculty of Computing, Faculty of Geography and Earth Sciences, Faculty of Physics, Mathematics and Optometry, Faculty of Chemistry, Faculty of Medicine, Institute of Geodesy and Geo-Information, Institute of Chemical Physics, Institute of Astronomy, Institute of Microbiology and Biotechnology, Institute of Atomic Physics and Spectroscopy, Institute of Materials Mechanics, Institute of Biology, Institute of Physics, Centre for Transdisciplinary Educational Innovation, and the Centre for Research of Natural Resources. **The Faculty of Economics and Social Sciences** will include the Faculty of Business, Management and Economics, Faculty of Social Sciences, and the Academic Centre for European and Societal Development Studies. **The Faculty of Humanities** will comprise the Faculty of Humanities, Faculty of History and Philosophy, Faculty of Theology, Institute of Philosophy and Sociology, Institute of Latvian History, Institute of Latvian Language, International Institute of Indian Studies, and the Institute of Livonian. **The Faculty of Education Sciences and Psychology** has been renamed from the previous Faculty of Pedagogy, Psychology and Art, while the Faculty of Law will maintain its current identity, continuing to prepare industry professionals and ensuring its sustainability. The decision will take effect from January 2, 2024, with changes being implemented gradually. To ensure the continuity of the university's operations, a transition period has been planned until September 1, 2024.

Over 30 meetings and discussions have taken place in the development and formation of the new university structure model, during which opinions of various groups interested in the university's development—including faculty and institute employees, students, alumni representatives, UL seniors, UL Council, Advisory Conventions, and Expert Councils—were discussed. By carrying out internal consolidation and following the good practices of Northern European universities, the University of Latvia is improving its organisational structure to boost its competitiveness, promote staff development, and provide comprehensive management of education and science. By creating a modern and effective governance-based structure, UL strives for higher quality in education and excellence in science, promoting a multidisciplinary and team-based approach. Our goal is to create conditions for everyone to effectively realise their potential for growth, forming adaptive plans, using a diverse range of research offerings, and choosing paths in academic or professional careers. With this decision on the consolidated faculties model, significant and ambitious changes are underway to focus efforts on achieving excellence in both research and education quality.

As of October 1, 2023, UL employs 3,155 people, including 1,390 academic staff and 1,765 general staff. In 2022, the university closed with a turnover of 98.4 million euros, and its equity as of December 31, 2022, was 133.1 million euros, or 65% of assets. UL's primary operations are in Riga at Raina Boulevard 19 and in the Tornakalns Academic Center, as well as in various locations in

Riga and regional branches in Aluksne, Bauska, Cesis, Jekabpils, Kuldiga, Madona, and Tukums.

In the world university ranking *Times Higher Education* for excellence in science, the UL is ranked 482nd, with an overall ranking of 1001-1200 range (2023).

The UL implements study programmes at all levels, covering 28 branches of science and 22 study fields. The UL 13 faculties offer 112 study programmes. See Table 1.1.1. for the study fields, the number of study programmes and the accreditation periods.

Table 1.1.1

Study fields implemented in the UL, number of study programmes and accreditation periods (31.12.2023.)

No	Study fields	Number of study programmes	Accreditation period
1.	Architecture and Construction	1	08.06.2022-09.06.2028.
2.	Wildlife Sciences	4	19.12.2023-20.12.2029.
3.	Economics	8	08.09.2021-09.09.2027.
4.	Physics, Materials Science, Mathematics and Statistics	6	04.10.2023-05.10.2029
5.	Geography and Earth Sciences	5	01.03.2023-02.03.2029.
6.	Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science	4	23.08.2023-24.08.2029.
7.	Internal Security and Civil Protection	4	05.06.2013-31.12.2024.
8.	Information and Communication Sciences	4	17.05.2023-18.05.2029
9.	Education, Pedagogy and Sports	9	12.06.2013-31.12.2024.
10.	Chemistry, Chemical Technologies and Biotechnology	2	25.10.2023-26.10.2029
11.	Arts	1	24.11.2021-25.11.2027.
12.	Psychology	3	21.06.2019-21.06.2025.
13.	Sociology, Political Science and Anthropology	8	17.11.2023-16.11.2029.
14.	Social Welfare	2	14.09.2022-13.09.2028

No	Study fields	Number of study programmes	Accreditation period
15.	Religion and Theology	3	13.09.2023-14.09.2029
16.	Law	4 (+2*)	21.06.2019-21.06.2025.
17.	Translation	1	14.05.2013-31.12.2024.
18.	Management, Administration and Management of Real Property	8	29.09.2021-30.09.2027.
19.	Language and Culture Studies, Mother Tongue Studies, and Language Programmes	10	06.12.2023-07.12.2029.
20.	Health Care	14	01.02.2023 -02.02.2029
21.	History and Philosophy	6	13.09.2023-14.09.2029
22.	Environmental Protection	3	05.06.2013-31.12.2024.

*licenced on 02.08.2023. and are not yet included in the respective field of study.

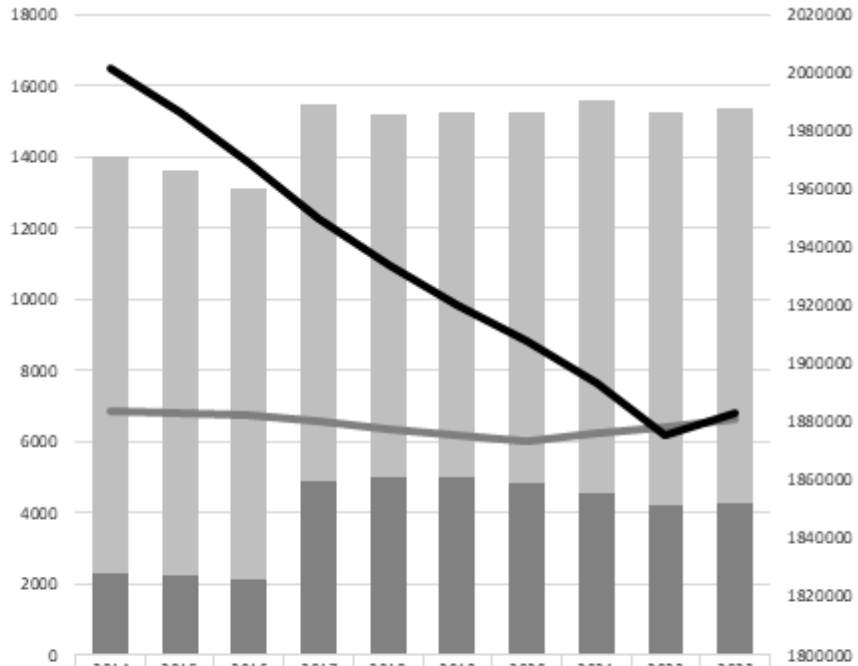
UL's study programs in specific fields of study are also available in seven UL branches across Latvia. For the 2023/2024 academic year, a total of 5 different study programs are offered in 2 fields of study in the branches, ranging from short-cycle professional higher education programs to professional bachelor's and master's degree programs. See table 1.1.2 for the number of study directions and programs offered in the branches.

Table 1.1.2

Number of study fields and study programmes implemented in the regional branches of the UL, data as of 2023

Regional branches	Aluksne	Bauska	Cesis	Jekabpils	Kuldiga	Madona	Tukums
Number of study fields	2	2	2	2	2	1	1
Number of study programmes	3	3	4	5	4	2	2
Number of students	56	213	513	135	296	76	291

As of October 1, 2023, 15,350 students are studying at UL, with 43% financed by state budget funds. About 10% of students are studying in UL branches. Each year, more than five thousand new students enrol. See figure 1.1.1 for student enrolment trends over the last ten years.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of students studying full-time at UL	11715	11360	10967	10630	10203	10240	10457	11054	11023	11061
Number of students studying part-time at UL	2305	2240	2133	4870	4997	5010	4803	4536	4227	4289
Number of students studying on budget at UL	6837	6784	6768	6583	6359	6181	6029	6253	6417	6647
Population in Latvia	2001468	1986096	1968957	1950116	1934379	1919968	1907675	1893223	1875757	1883008

Source: Population at the beginning of year, population change and key vital statistics - Indicators and Time Period.PxWeb (stat.gov.lv)

***Fig. 1.1.1.** Number of students at the UL compared to the population of Latvia, 2014-2022*

The UL Senate approved Strategic Study Program Clusters, study programs, and lifelong learning priorities for medium and long-term development, as well as long-term priority research areas and scientific activities, as outlined in UL's Study Process Development Plan until 2023 and UL Scientific Activity Development Plan until 2030. Both plans define the essential resources, and most effective funding, organisation, and management forms necessary for the realisation and development of education and science activities. The documents are based on Latvia's "Future Skills for Future Society" Education Development Guidelines 2021-2027 and the Latvian Science, Technology Development and Innovation Guidelines 2021-2027 and are informed by UL's strategic specialisation and mission as established in the UL Constitution.

Approved by the UL Senate, the UL medium-term development strategy for 2021-2027 (UL Strategy 2021-2027 LV, ENG) articulates the UL mission statement and defines strategic goals in six development areas, three each in core and institutional realms. Goals encompass science, education, public education, as well as staff and organisational culture, environment, and governance.

The 2021-2027 UL Strategy envisions the university's further development as an internationally recognized science centre, refinement of unique study and lifelong learning programs, and offerings for competitive work and study conditions. UL continues the work started in the previous strategic period to achieve the highest level of scientific excellence, promote student-oriented studies, and develop a modern study environment. UL is strategically fostering its involvement and contribution to Latvian society, refining necessary work conditions and environments for talent development. Sustainable growth is increasingly important and becomes a guiding principle across all of its activities. Significant attention is given to ensuring academic honesty and strengthening a value-

oriented UL organisational culture. See table 1.1.3 for UL's current strategic directions and goals.

Table 1.1.3

The UL Strategic Goals Map, 2021-2027

Development directions (D)	Strategic goals (G)
Development of principal activities	
1.D. Scientific excellence	1.G. Internationally recognized research university
2.D. Development of studies	2.G. Unique study offer and high competitiveness of graduates
3.D. Contribution to society	3.G. University activities as a basis for the growth of Latvia
Institutional development	
4.D. Talent development	4.G. Development- and excellence-oriented HR policy
5.D. Environment and governance	5.G. Green thinking, attractive, sustainable university environment, and effective administrative support
6.D. Organisational culture	6.G. Inclusive, cooperation- and innovation-focused culture

The outcomes of the implementation of *the UL Strategy 2021-2027* are measured by twenty-one performance indicators, five of which have been designated as *the UL Key Performance Indicators*. They are – research funding from foreign sources per full-time equivalent of academic staff in EUR, co-publications with foreign partners in *Scopus* and *Web of Science* databases (%), the percentage of graduates who are satisfied (rated at least 'good') with the quality of their studies (%); the percentage of foreign students at UL (%), as well as the commercialisation revenue (EUR/thousands).

1.2. Description of the management structure of the higher education institution/ college, the main institutions involved in the decision-making process, their composition (percentage depending on the position, for instance, the academic staff, administrative staff members, students), and the powers of these institutions.

The main decision-making bodies of the UL are the Constitutional Assembly, the Senate, the Council, the Rector, and the Academic Arbitration Court. See Table 1.2.1 for the proportion of the composition of the main decision-making bodies of the UL and the terms of the elections.

Table 1.2.1

Characterisation of the terms of election, proportion of the composition, and authority of the main decision-making bodies of the UL

Decision-making Body	Term of Election	Total Number of Participants	Representation of Academic Staff	Representation of General staff	Student Representation
Constitutional Assembly	3 years	200	65%	10%	25%
Council	4 years	11	45.5%*		
Senate	3 years	50	76%	4%	20%
Rector	4 years	1	100%		
Academic Arbitration Court	3 years	5	80%		20%

*In the UL Council there are 11 members, of whom: five, selected in accordance with the procedure laid down in the Constitution of the University, are nominated by the Senate (45,5%); one, an eminent academic outside the University, is nominated by the President of the Republic (9%); five representatives of the public in accordance with the procedure established by the Cabinet of Ministers, involving the public in the selection process (including graduate organizations, industry associations and employers, representatives of academic, research and creative organizations, persons with internationally significant achievements in science, arts or business, representatives of sectoral ministries and local governments), shall be selected by the ministry under whose supervision the higher education institution is placed and nominated by the Cabinet of Ministers (45,5%).

For characterisation of the authority of the main UL decision-making bodies, see chapter 1.2. of *the UL Quality Management Handbook*. (*The Quality Management Handbook* is available in the section *Other annexes*)

The governance structure of the UL: LV, ENG

1.3. Description of the mechanism for the implementation of the quality policy and the procedures for the assurance of the quality of higher education. Description of the stakeholders involved in the development and improvement of the quality assurance system and their role in these processes.

The *Quality Policy* and the resulting *Quality Action Policy* are a set of quality-related principles, objectives and the actions necessary for their achievement. UL quality is defined as a measure of excellence, which characterises the ability to meet and exceed the visible and future needs of the involved parties, as well as to ensure the compliance of processes with the regulated requirements of the relevant sector, and international standards recognised in the organisation management.

The quality management system of the UL is implemented in accordance with the principles of the *Total Quality Management* (TQM), integrating the approach of excellence into the corporate culture of the UL. For the implementation of total quality management, the UL uses an internationally recognised and applicable quality management methodology – the *European Foundation of Quality Management* (EFQM) excellence model. In the core activities the quality management system is deepened by developing internal quality assurance systems integrated into the quality management system, which are based on current sectoral standards and frameworks.

The internationally recognised *Results–Approach–Deployment–Assessment–and–Refine* (RADAR) methodology is used to ensure the cycle and continuity of quality management at the UL; the *Plan–Do–Check–Act* (PDCA) approach is used in quality assurance systems.

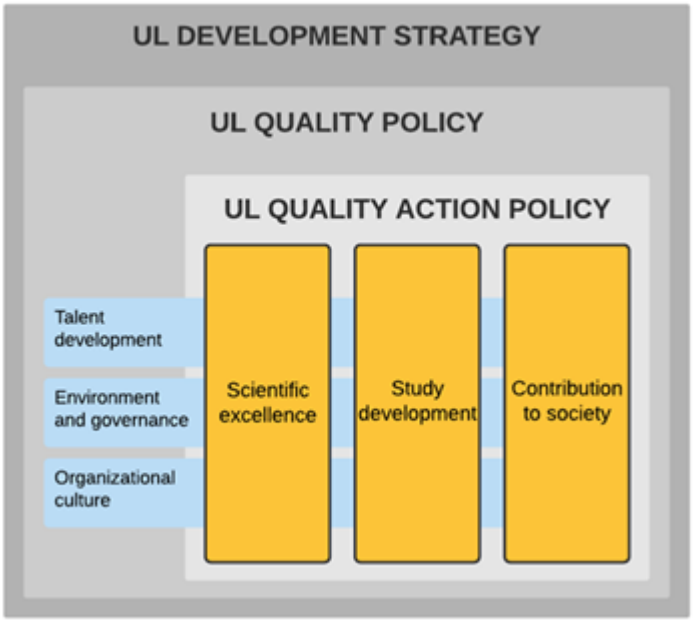


Fig. 1.3.1. *Hierarchy of the Quality Policy and Action Policies at the UL*

The quality management system documents are structured hierarchically according to the EFQM 2020 model: direction identification documents, implementation documents and documents supporting results. Figure 1.3.1 shows the UL's direction-setting documents.

Hierarchically, the highest quality management system documents are UL’s Study Process Development Plan until 2030, UL Scientific Activity Development Plan until 2030 and the UL Strategy 2021.-2027, the promotion of which is the fundamental objective of the Quality Management System. The coordination of planning documents within the quality management framework provides the implementation and development of processes in compliance with the Strategic and Quality Goals of UL.

UL perspective regarding the quality of the implementation of the Strategy has been described by covering all the key areas of activity in the UL Quality Policy, as well as specified in the main strategic development directions (scientific activity, studies and collaboration with society, as well as horizontally in the areas of talent development, environment and governance, and organizational culture) - in the UL Quality Action Policy.

Figure 1.3.2 provides a diagram of a quality management system with an integrated quality assurance system for studies. For a more detailed description of the UL Quality Management System, see Chapter 2.1 of the *UL Quality Management Handbook*. (*The Quality Management Handbook* is available in the section *Other annexes*)

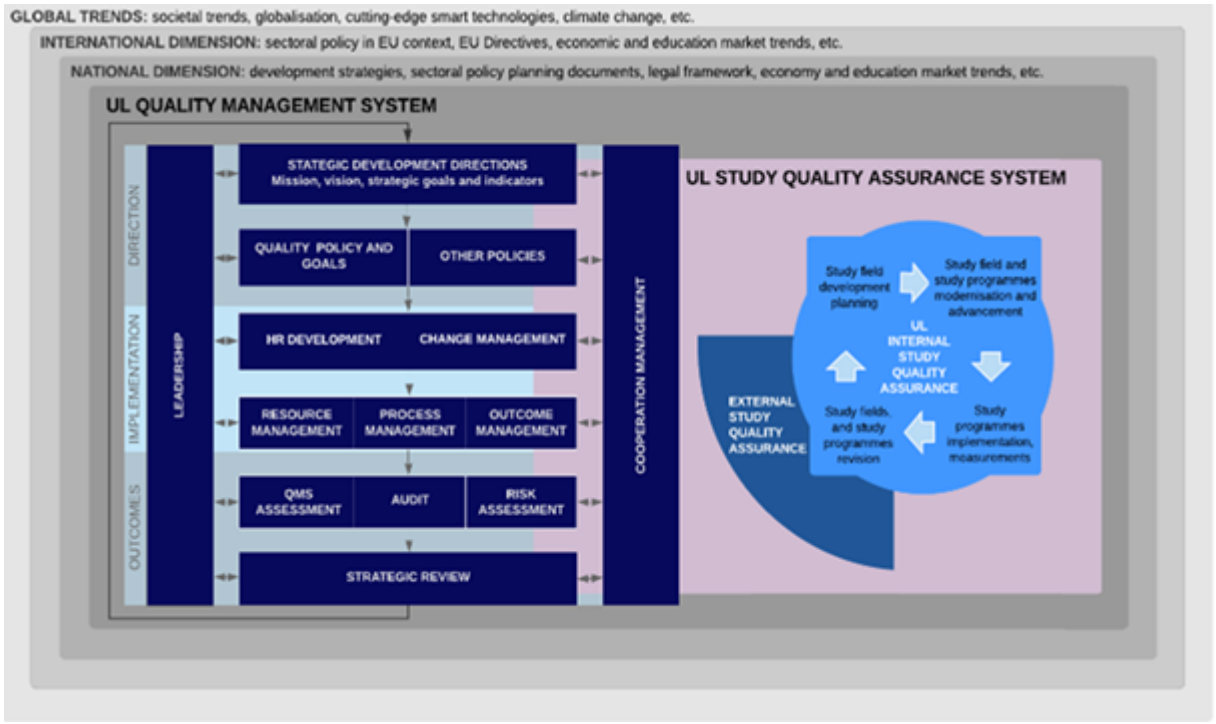


Fig. 1.3.2. *The UL Quality Management System and Principles of the Study Quality Assurance System of the UL*

To ensure the quality of higher education, the UL implements the Quality Assurance System for Studies, which includes procedures for planning, ensuring, measuring, and evaluating the quality of higher education in accordance with the requirements of legislation of Latvia, *the European Standards and Guidelines (ESG) for quality assurance in the European Higher Education Area (EHA)*, as well as for internal needs. In the UL planning for the development of the study field and improvement of the study programmes for a period of 6 years is ensured. The procedure for the implementation of study programmes is established in the internal legal acts of the UL, including regulation of the development of new study programmes, admission requirements, matriculation and registration for studies, development, implementation and review of study courses and modules, planning, implementation and assessment of study internship, organisation of assessments and final examinations, and rotation, the principles of academic integrity and their observance, exmatriculation, awarding of diplomas and certificates, the recognition of knowledge, skills, competence acquired through non-formal and extra-curricular education or in professional experience, recognition of learning outcomes achieved in the previous education, and referencing of academic activity, the procedure for conducting surveys, submission of student proposals and complaints, contestation of administrative decisions, doctorate promotion process, etc. UL ensures that the measurements and data necessary for quality assessment and improvement are collected and used for both immediate corrective action and regular evaluation and planning of further improvement. The 6-year study field development plan is monitored annually, the measurements are analysed, and the SWOT is discussed, if necessary, by introducing changes to the operational study programme implementation plans, to the study field plan or, when assessing the overall development of study fields within the framework of the UL Strategic Control, by making amendments to the UL Strategic Action Plans. For more information on quality assurance of studies, see Chapter 3.1 of *the UL Quality Management Handbook*. For the breakdown of responsibilities for quality management and assurance, see Section 2.5 of *the UL Quality Management Handbook*.

The UL quality assurance system is based on the participation of key stakeholders in the quality assessment and improvement of the UL activities. Stakeholders of the UL are natural or legal persons, domestic and international, who use the services of the UL or whose socio-economic

situation is affected by the activities of the UL. The key stakeholders are defined in Article 12 of *the UL Quality Policy*. For the description and examples of the roles of key stakeholders in quality management, see Section 3.2, subsection 1.2 (Table 3.6) of *the UL Quality Management Handbook*.

1.4. Fill in the table on the compliance of the internal quality assurance system of the higher education institution/ college with the provisions of Section 5, Paragraph 2(1) of the Law on Higher Education Institutions by providing a justification for the given statement. In addition, it is also possible to refer to the respective chapter of the Self-Assessment Report, where the provided information serves as justification.

1.	The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.	The UL has formulated the Quality Policy, which is detailed in the Quality Action Policy in line with its strategic core activities. For quality assurance of higher education, the UL Studies Quality Assurance System (in compliance with ESG) has been implemented and integrated into the UL Quality Management System (in compliance with EFQM). For more information, see Part I, Section 1.3 of this document and Section 3.1 of the UL Quality Management Handbook (The Quality Management Handbook is available in the section Other annexes) The establishment, maintenance, and improvement of the UL quality management system are performed by the management and heads of core structural units (deans of faculties) and their delegated employees. The Academic Department is responsible for the establishment, implementation, and improvement of the study quality assurance system, in close cooperation with the heads of study fields and directors of study programmes. Two collegiate committees have been established for quality assessment with the participation of the UL stakeholders: The Quality Advisory Committee and the Study Programme Quality Assessment Committee. For more information, see Section 2.5 of the UL Quality Management Handbook.

2.	A mechanism for the creation and internal approval of the study programmes of the higher education institution/ college, as well as the supervision of their performance and periodic inspection thereof, has been developed.	The development and internal approval of study programmes are stipulated in the Regulations of the University of Latvia on Study Programmes and Continuing Education Programmes (the UL Senate Decision No 102 of 24.04.2017). For more information, see part II, subsection 2.2.2. of this report, as well as subsection II of Section 3.1 the UL Quality Management Handbook Periodic quality review of study programmes is stipulated in the Procedure for Preparation of Annual Reports on UL Study Fields (the UL Order No 1/290 of 14.07.2020). For more information, see part II, subsection 2.2.2. of this report, Section 3.1, subsections IX, and X of the UL Quality Management Handbook.
3.	The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and made public.	Information related to learning outcomes, including assessment, is contained in study course descriptions, the preparation and updating of which, as well as the rules for their publication, are stipulated in the Procedure for the Development and Actualisation of Study Courses at the University of Latvia (the UL Order No 1/277 of 10.08.2018). Process and assessment of entrance examinations and final examinations, as well as the assessment and recognition of learning outcomes achieved in previous education or professional experience, are regulated by the relevant regulations of the UL. For more information, see part II, subsections 2.1.4. and 2.1.5. of this report. The desired ethical and fair conduct and justice are ensured at the UL by internally regulating issues related to the academic freedom and academic integrity, electing, and ensuring the Academic Arbitration Court, and ensuring the operation of the Academic Ethics Committee, as well as regulating the principles of protection of intellectual property rights. For more information, see part II, subsection 2.1.6. of this report, and the Quality Management Handbook, Section 3.2, subsection 2.1.

4.	Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.	The principles of personnel management at the UL in the areas of personnel selection, labour relations, motivation system and personnel development are defined in the UL Human Resource Management Policy (the UL Senate Decision No 264 of 28.01.2019). Accordingly, the development of academic staff is planned for the medium-term, and training plans are drawn up for the year. The qualification requirements of the staff are defined in the internal regulatory enactments of the UL in accordance with the external regulatory enactments, however the requirements for ensuring the quality of work – within the framework of regular staff appraisal, including the analysis of students' satisfaction with the delivered study courses, as well as the results of scientific activity. For more information on attracting, engaging, developing, and retaining staff: see part 2, subsections 2.3.5. and 2.3.6. of this report, and the UL Quality Management Handbook, Section 3.2, subsection 3.2.
5.	The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available, and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.	Information on students' grades is accumulated in the information system of the University of Latvia (hereinafter – ULIS) and analysed in the framework of study course implementation (including student-centred approach) and study programme improvement. Satisfaction of students and graduates with the study programme is monitored through communication activities of staff involved in the implementation of study programmes, representation of students and graduates in decision-making and advisory bodies, as well as by conducting surveys in accordance with the Regulation on the Procedure of Regular Surveys for the Evaluation of Studies at the University of Latvia (the UL Order No 1-4/260 of 12.06.2023.). For more information on the involvement of stakeholders in quality assurance see part II, subsection 2.2.4. of this report, and Section 3.2, subsection 1.2 of the UL Quality Management Handbook. Issues related to the efficiency of academic staff, available study resources and their costs are monitored in the core structural units (faculties, institutes, etc.) as well as centrally. For more information on study information management, see part II, Section 2.3. of this report, and Section 3.1, subsection VII of the UL Quality Management Handbook. The performance management system of the UL results had been introduced and implemented at the UL, within which the key performance indicators of the UL are monitored according to which further strategic decisions are made. For more information, see Section 3.2, subsection 7 of the UL Quality Management Handbook.

6.	The higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing their quality assurance systems.	The development of each study field is planned in accordance with the 6-year development strategy of the UL. The monitoring of the plan and the evaluation of its effectiveness are conducted within the framework of the annual self-assessment of the study field. These processes take place at the level of the respective Study Field Council, the core structural unit(s) implementing the study field (a study field may be implemented by several faculties), as well as at the level of the administration and the Senate. The UL provides the external evaluation required by the legislation, obtaining additional external quality certificates for individual programmes. For more information, see Part II, subsection 2.2.2. of this report, and Section IX and X of the UL Quality Management Handbook. To promote the quality and competitiveness of the study programmes of the UL, UL creates and finances internal grant projects (Fund for improvement of the study quality of the UL), as well as attracts external funds (European Social Fund (https://www.ozolzile.lu.lv/projekti/eiropas-socialais-fonds/)(available only in Latvian), Erasmus+ (https://www.ozolzile.lu.lv/projekti/erasmus/)).

2.1. Management of the Study Field

2.1.1. Aims of the study field and their compliance with the scope of activities of the higher education institution/ college, the strategic development fields, as well as the development needs of the society and the national economy. The assessment of the interrelation of the study field and the study programmes included in it.

The relevance of the study field “Environmental protection” and the study programmes is determined not only by the fact that it provides education and research in the direction of environmental protection (natural environment and human environment) but also offers knowledge necessary to ensure the sustainability of development. The necessity of the study field currently and in perspective is determined by its relevance at international, national, and local levels (for example, at the level of enterprises and municipalities). The relevance of the study field is determined globally by the set of Sustainable Development Goals (UN Convention on Sustainable Development) but at the EU level by the determined strategic development goals of the European Union (EU Sustainable Development Strategy – Lisbon Strategy and Gothenburg Declaration, EU Green Course). Ensuring the solution of nature protection tasks is a direct task of many EU Framework Directives (REACH, Water Framework Directive, and others), providing specific assignments for member states, including, certainly, Latvia and which requirements are integrated into the legislation of Latvia. From the point of view of the interests of the Republic of Latvia, the relevance of the study field “Environmental protection” and the study programmes is determined by the need to fulfill the requirements of international and EU regulatory acts and the fact that sustainable development, green economy, and environmental protection are defined as the strategic directions of the development of state of Latvia. This has been repeatedly emphasized in the content of the National Development Plan, Sustainable Development Strategy “Latvia 2030”

and other development planning documents. The field of environment figures among several priority directions of science and innovation. The aim of the study field “Environmental protection” and the study programmes is to promote the tasks set by the state, to prepare educated specialists to solve them, and this determines the relevance of the perspective and the current issues of education and research in this direction. The task of the study field “Environmental protection” and the study programmes is to ensure with specialists in state management institutions of Latvia (the Ministry of Environmental Protection and Regional Development of the Republic of Latvia, the Ministry of Climate and Energetics, municipalities, State Environmental Service, Regional Environmental Boards), environmental quality control institutions (SLLC “Latvian Environment, Geology, and Meteorology Centre”, Institute of Food Safety, Animal Health and Environment “BIOR” and others), consulting companies, enterprises developing environmental technologies, enterprises providing quality systems and other institutions.

The study field “Environmental protection” involves three study programmes, as indicated in **Table 2.1.1.1**.

Table 2.1.1.1.

The study programmes of the study field

No	Name of the study programme	LRI code	Length and amount, CP	Type and form of studies	Language of implementation	Awarded degree and/or qualification	The requirements set when starting the study programme	Place of implementation
1.	*Academic bachelor’s (first cycle) study programme* ***“Environmental science”***	43431	3 years 120 CP (180 ECTS)	*Full-time intramural studies*	*Latvian*	*Natural Sciences Bachelor’s Degree in Environmental Science*	*Secondary education*	UL FGES
2.	*Academic master’s (second cycle) study programme* ***“Environmental science”***	45431	2 years, 80 CP (120 ECTS)	*Full-time intramural studies*	*Latvian*	*Natural Sciences Master’s Degree in Environmental Science*	*Higher education of the first cycle (bachelor’s degree or second-level professional higher education (or equivalent to it higher education)) in natural sciences, environmental science, engineering sciences, agricultural sciences or forestry sciences and an entrance examination*	UL FGES
3.	*Academic bachelor’s (first cycle) study programme* ***“Research and protection of Cultural and Environmental Heritage”***	*43431*	*4 years 160 CP (240 ECTS)*	*Full-time intramural studies*	*Latvian, English*	*Natural Sciences Bachelor’s Degree in Environmental Science*	*Secondary education*	UL FGES

From these three study programmes, the academic bachelor's study programme "Research and protection of Cultural and Environmental Heritage" (formerly "Cultural and environmental heritage" till 24th October, 2023) was created within the framework of project No 8.2.1.0/18/A/015 "Creation of Internationally Competitive Study Programmes Promoting the Development of the National Economy of Latvia in the University of Latvia" in cooperation with the Art Academy of Latvia, and was licensed on August 24, 2022.

The UL has defined its mission, vision, as well as the UL's Development Directions and Strategic Goals in the UL Strategy 2021–2027. It was created considering the vision of the UL management, employees, students, and society representatives regarding the development needs and trends of the institution, society, and national economy. The same principles and priorities set by the UL were used in determining the objectives of the study field (SF) (Annex 3). The objectives of the SF are formed by following the Latvian and international development trends in the corresponding to the SF scientific branches and the current international issues of the academic environment and higher education. The objectives of the SF are structured according to the six UL's Development Directions in the sections of core activities and institutional development. The goal is emphasized by the priorities of the SF in the framework of the UL's Strategic Goals, focusing on the challenges to be solved at the SF level. The defined goals are compiled in Table 2.1.1.2. The interlinking of the study programmes included in the objectives of the SF can be characterized by several aspects: 1) from an administrative point of view, all programmes are implemented within the framework of one basic structural unit – the Faculty of Geography and Earth Sciences of the UL (UL FGES). It means that the SF and its programmes' objectives and the development plan are easier to connect with the goals and priorities of the faculty, furthermore, the linking exists with the study programmes of the study field "Earth sciences"; 2) in terms of content, the programmes of the SF have a significant interlinking, because, at the initial stage of the programmes, a series of standard courses at the bachelor's level exist, mostly in natural sciences; 3) the SF's programmes are closely interlinked administratively, thematically and content-wise, thus providing broad opportunities for effective, interdisciplinary and innovative implementation of the SF EP; 4) interlinking of study programmes is emphasized by the linking in research affecting the development of both academic staff and elaboration of students' qualification theses.

2.1.2. SWOT analysis of the study field with regard to the set aims by providing explanations on how the higher education institution/ college expects to eliminate/ improve weaknesses, prevent threats, and avail themselves of the given opportunities, etc. The assessment of the plan for the development of the study field for the next six years and the procedure of the elaboration thereof. In case there is no development plan elaborated or the aims/ objectives are set for a shorter period of time, information on the elaboration of the plan for the development of the study field for the next assessment period shall be provided.

The development of the SF EP objectives, Development Plan, and SWOT analysis was realized in several steps. Initially, a working group formed by a collective of the SF programmes' directors and corresponding heads of departments, supplemented by an industry representative, prepared draft documents. These were discussed in several iterations in the Development Plan elaboration working group, the SWOT analysis working group, and the SF EP Council. Afterward, the Development Plan was discussed with the representatives of the Academic Department and student representatives from the Student Council of the UL FGES, then followed by a discussion on the draft document at

the meeting of the SF EP Council. At each of the steps, suggestions, remarks, and reprimands were applied to improve the documents. The final version of the Development Plan was approved by the SF EP Council on 16.02.2023. and by the UL FGES Council on 20.02.2023.

The SWOT analysis of the study field is reflected in **Table 2.1.2.1**.

Table 2.1.2.1.

The SWOT analysis of the study field

Internal Factors	
Strengths	**Weaknesses**
1. Comprehensive higher education in environmental science, relevant to the labour market and research provision. 2. The study programmes included in the study field (bachelor's, master's) provide three-level studies corresponding to the three-cycle degree system of the Bologna Process. 3. Experienced, highly qualified, creative and professional academic staff. 4. Successful involvement of social partners in the study process. 5. Balanced theory and practice in the content of study programmes; opportunities for field courses and internships during studies. 6. The equipment and capacity of the laboratories at the UL Natural Sciences Centre, availability of IT, and library resources are the basis for successful studies and research. 7. Close cooperation in the study process and research with other study areas at the UL and other universities (Riga Technical University, Daugavpils University, Latvia University of Life Sciences and Technologies) and research institutes in Latvia. 8. Active involvement in scientific projects at international and national level, including those related to the achievement of the goals set in the environmental and climate policy of Latvia. 9. Good cooperation with employers and graduates in improving and popularizing the study field. 10. Provision of state publicly funded study places. 11. The ability of study programmes' graduates to compete successfully in Europe, including the labour market of Latvia.	1. Relatively high student attrition rate – the number of students not completing their studies, mainly in the first study year. 2. Different level of students' preparedness when starting their studies. 3. Insufficient state public funding to ensure the study process and scientific research. 4. Low proportion of foreign visiting university lecturers in the course of studies and limited financial and regulatory opportunities to attract high-level foreign university lecturers. 5. Insufficiently used available Erasmus and Erasmus+ programmes funds for the mobility of students and academic staff. 6. Communication problems in the organization, implementation and improvement of the study process. 7. Insufficiently used possibilities of the e-study environment. Overlapping of the content of individual study courses. 8. Insufficient use of foreign languages in the study process. 9. Lack of motivation for individual university lecturers to improve study content and teaching methods.

External Factors	
Opportunities	**Threats**
1. Opportunities to use offered by the UL and other institutions to increase the qualifications and competence of university teachers. 2. Using of funds provided by Erasmus, Erasmus+ and other programmes to increase the mobility of academic staff and students. 3. Exploiting the infrastructure of the UL Natural Sciences Centre in the development of interdisciplinary and interuniversity research. 4. Attracting the EU financial resources to increase the quality of studies, as well as the development of study programmes and research projects. 5. Expanding cooperation with state and commercial institutions, increasing the quality of the study process and the volume of applied research. 6. Attracting qualified university lecturers from Latvia and abroad using EU funds. 7. Broader and more diverse advertising of study programmes on social networks, the UL homepage and other Internet sites, as well as in schools. 8. Using the European Green Deal in popularizing the importance and current issues of the study field and attracting funds for the improvement of the study process. 9. Increasing the openness of the study programmes in cooperation with other study programmes.	1. Decreasing of the number of school graduates due to demographic processes (including emigration) and economic problems. 2. Decrease in the level of knowledge of school graduates in natural sciences and mathematics affecting the students' ability to acquire the study programme. 3. Insufficiency of financial resources for further education of academic staff and research. 4. Early involvement of students in the labour market hindering the acquiring of the study content. 5. Uncertainties in the course of the reforms implemented in secondary schools and the results to be achieved. 6. Uncertainty in higher education reform. 7. The dominance of remote studies, emergency situations reducing the motivation of academic staff and students. 8. Non-competitive remuneration for academic staff in the labour market of Latvia. 9. Risks caused by the reorganization of the UL structure.

In order to eliminate the weaknesses of the SF and reduce the threats, a set of measures is planned ensuring and/or promoting, respectively:

- various forms of studies according to the students' needs,
- inclusive studies,
- implementation of the student-centred study process,
- a higher level study demand,
- active cooperation with schools, students and teachers.

In general, it will popularize the study programmes, promote student satisfaction with studies, directly and indirectly contributing to the increase in the number of students, reducing the student attrition, which results in increased number of graduates. Strengths indicated as 1, 2, 3, 4, 6, 7 and options indicated as 2, 3, 4, 5 will be used to address the weakness points. A planned set of measures will ensure:

- active cooperation with schools, students and teachers,

- timely and accurate circulation of internal information,
- inter-institutional cooperation.

It will improve the flow of internal and external information, including providing students and teachers with more accurate information about the opportunities for studies and employment of graduates.

A set of activities is planned that promotes the growth of teaching staff, which may result in new professors (including associate professors):

- promoted implementation of internationally recognized research,
- implemented science-based studies (attracting industry specialists from researchers),
- improved staff skills in university lecturing.

In addition, it is planned to ensure the regeneration of the SF's academic staff with internationally recognized specialists, including by promoting the growth of local university lecturers.

The mechanisms will be defined and implemented to inform students about courses in related fields and their choice, including recommendations on interdisciplinary study courses.

The SWOT analysis of the study field "Environmental protection" reveals that strengths are dominant. The management of the study field has set the goal of further reinforcing and developing the strengths of the direction and reducing threats and weaknesses. Taking into account the orientation towards the development of environmental science and the preparation of specialists in demand on the labour market, it is planned to expand the cooperation with other environmental protection institutions (state institutions, private companies and the non-governmental sector) in Latvia. An important direction of development is the expansion of cooperation with universities research institutes in Latvia and abroad. The future development opportunities of the study field can be evaluated positively allowing to reduce threats and overcome them. The study field should be developed in such a way that the study programmes of the UL provide the best education in environmental science both in Latvia and in the Baltic Sea area. The SWOT analysis of the study field is the basis for the SF Development Plan.

Taking into account the SWOT analysis, the SF Development Plan provides for:

1. Ensuring the regular updating of the content of study courses, taking into account the current issues in environmental protection, trends in environmental science, as well as the needs of the labour market;
2. Increasing and stabilizing the number of students in bachelor's and master's study programmes, reducing student attrition;
3. Increasing the number of academic staff and students actively involved in the activities of academic mobility;
4. Promoting the internship of academic staff in universities of Latvia and abroad, in national economy and environmental protection institutions;
5. Increasing the student involvement in the implementation of research projects;
6. Ensuring the operation and renewal of the existing infrastructure by attracting funding within the framework of research projects.

2.1.3. The structure of the management of the study field and the relevant study programmes, and the analysis and assessment of the efficiency thereof, including the assessment of the role of the head of the study field and the heads of the study programmes, their responsibilities, and the cooperation with other heads of the study

programmes, as well as the assessment of the support by the administrative and technical staff of the higher education institution/ college provided within the study field.

Collegiate responsibility for the administration of the study field lies with the UL decision-making bodies – the Senate, the UL Study Programme Quality Assessment Commission (hereinafter – SP QAC) (headed by vice rectors), respective faculty councils and study field councils, which evaluate study quality and decide on study quality assurance measures.

The governance of the UL is responsible for the study quality assurance, delegating responsibility for the development and functioning of the study quality assurance system to the Academic Department.

The responsibility for the development of the study field and quality of implemented study programmes lies with the head of the study field and dean, study programme directors, and subprogramme directors.

Each lecturer is responsible for the quality of the content and implementation of the study course, research activity and professional development.

The students' responsibility is defined in their rights and obligations to promote the achievement of the UL goals and excellence in studies, participating in the UL collegial institutions and regularly expressing their opinion in student surveys**.**

See Annex 4, the scheme of the UL field of study and the study programs included in it.

The Regulations on the University of Latvia Study Field Management (the UL Senate Decision No 70 of 27.01.2020) determine the procedure for the management, quality assurance and development of study fields at the UL; the functions and operating principles of the respective Study Field Council; qualification requirements, duties, responsibilities, and rights of the head of the study field, study programme director, and the head of the subprogramme of the respective study field.

Each UL study programme has **a study programme director** who directs the development and implementation of the study programme. The director of the study programme is approved by the Senate on the proposal of the respective Faculty Council. The study programme director is a member of the Study Field Council of the respective branches of science and coordinates their activities with the respective Head of the Study Field and Study Field Council. The study programme director is accountable for their activities to the dean of the faculty. Responsibilities of the study programme directors include ensuring a well-functioning, sustainable operation of the study programme in accordance with the procedures specified by the UL and other responsibilities. If the study programme covers several subprogrammes providing a specific qualification or specialisation, then each subprogramme may have their own head. In this case, part of the study programme director's duties is performed by the head of the subprogramme. The **head of the subprogramme** is approved by the respective Faculty Council. The head of the subprogramme is accountable for their activities to the study programme director.

The competence of the head of the study field is to ensure the management and development of the study field. The head of the study field is approved by the Rector on the proposal of the dean of the respective faculty. The head of the study field is accountable to the respective Study Field Council and the dean. The heads of study fields, in cooperation with the study programme directors and the director of the UL Regional Centre, in cases when the study programmes included in the study field are implemented in the UL regional branches, ensure the revision, development planning and implementation of study programmes included in the study field. Heads of study fields

organise the work of study field councils, as well as regularly organise the development of annual study field reports and their promotion for review and approval to the respective Study Field Council and respective Faculty Council. Heads of study fields in cooperation with the study programme directors and the Academic Department of the UL ensure the accreditation and re-accreditation of the study field and perform other duties. The Head of the Study Field may have deputies.

The Study Field Council is a collegial study field management body, which supervises academic, professional (including residency) and doctoral study programmes of all levels within one study field. The participants of the respective Study Field Council is the head of the study field and its deputy, if there is one, the study programme directors and subprogramme directors relevant to the study field, the representatives of the students in respective programmes (not less than 20% of the composition of the Study Field Council, promoting the representation of all levels of study programmes, as well as the largest possible number of study programmes, nominated by the students self-government), representatives of employers and cooperation partners of the study field (candidates are nominated by the heads of structural units, heads of study fields, study programme directors and heads of subprogrammes). The composition of the Study Field Council may be supplemented with graduates of the respective study field programme who are not involved in the implementation of said study field, as well as with professors, associate professors, and other qualified specialists (candidates are nominated by the heads of structural units, heads of study fields and study programme directors). The Study Field Council approves the development plan of the study field, evaluate the concepts of new study programmes, changes in study programmes, annual self-assessment reports of the study field, licencing and accreditation applications and related documentation.

Faculty Councils, consisting of representatives of the academic and general staff, elected for three years, and student representatives, who make up at least 20% of the councillors, decide on academic, economic, financial, and other activities of the faculty that are within the competence of the faculty or may be passed on to the Senate.

The Study Programme Quality Assessment Commission assesses the performance of UL study fields and study programmes, as well as makes proposals to the respective Faculty Council and the UL governance on the further development of the programmes. SP QAC reviews and provides opinions on study programmes, including, evaluates applications of new study programme concepts, new study programmes and closure proposals, significant changes in accredited study fields that require a decision of the SP QAC, as well as applications for new study modules and subprogrammes. When evaluating the concepts of new study programmes, annual reports of study programmes and study fields, the SP QAC is guided by the opinion of anonymous, independent experts. The SP QAC consists of vice-rectors, the Chairman of the Academic Commission of the Senate or his authorised representative, the Director of the Academic Department and representatives, the Representative of the Department of Study Service, the Internal Auditor, the Head of Quality, representative of the Library of the UL, a representative delegated by the Student’s Council (hereinafter – SC) and a representative delegated by the UL Alumni Club.

Starting the implementation of *the UL Strategy 2021-2027*, based on the efficiency audit of the administrative structural units performed in 2021, the UL administration was significantly reorganised in November of 2021, thus strengthening the strategic and quality management functions in the structural units of the administrative structural units. One of the most significant changes is the integration of the Study Department of the University of Latvia and the Department of Science of the University of Latvia, forming the Academic Department, thus strengthening the unity of higher education and science.

The UL Administration has the following units: Academic Department, Department of Study Service, Department of Communication, Legal Department, Department of Human Resources, Department of Information Technology, Department of Finance and Accounting, Document Management Division, Infrastructure Management Division, Real Estate Revenue Division, Institutional Data Analysis Centre, Project Support Centre, Academic Centre Development programme, Study Development and Management Improvement Programme. The Chancellor of the UL, the internal auditor, the quality manager, the head of the work safety system, and the information technology security manager also operate as a part of the administration. The study process is also supported by the main structural units under the Head of the Administration – the Culture Centre, Sports Centre and the Pre-study Training, and Dormitory Service Centre.

In the UL Administration **the Academic Department** has the key role in the management of the field of study. The Academic Department consists of the Academic Policy Division, the Science Projects Division, the Study Quality Assurance Division, and the Lifelong Learning Division. The competence of the Academic Department is to monitor the requirements of the regulatory enactments in force in the Republic of Latvia and changes therein, national and European Union (hereinafter – EU) development policy documents, as well as standards and good practices in the field of academic activities and lifelong learning. The Academic Department ensures the UL functional strategy, development of regulations and supervision of their implementation in these fields corresponding to the outer regulations and to the UL Strategy; ensures the development, implementation of studies, as well as scientific quality assurance systems (or processes)' monitoring and continuous improvement of their implementation; ensures regular review of academic and lifelong learning processes and risks; regular review of methods and procedures; identifies and ensures necessary control and preventive measures in accordance with the practice implemented by the UL; ensures analytical identification of the results of academic activities and lifelong learning and the opportunities for their improvement, etc.. The Division of Study Quality Assurance monitors the compliance of all study levels with internal regulations; coordinates the medium-term development plan of studies in cooperation with faculties; manages its implementation; monitors and provides methodological support in developing new study programmes and implementing and improving existing programmes; organises internal quality assurance processes in studies; organises and coordinates external quality assessment; ensures centralised administration of doctoral student admission, doctoral studies and promotion process; provides support in the process of implementation and improvement of studies at all levels; evaluates study programme results and competitiveness; and participates in resource evaluation.

The Department of Study Service consists of the Academic Services Division, the Admissions Division and the Mobility Division, which are competent to organise and ensure the matriculation and exmatriculation of national and international students; the circulation of study documents and their registration; maintain the graduation documentation (qualification) register, including diplomas and graduates register; to provide students with social, cultural and other support functions, as well as to provide consultations and information to students on social security; to inform potential applicants and candidates about the study programmes, study process and study organisation, as well as to ensure the administration and implementation of mobility programmes, etc.

The Head of the UL Quality Control and the Internal Auditor also participate in the development, evaluation, and improvement of the study quality management system.

According to the new *Regulations of the Administration of the University of Latvia*, the Department of Human Resources established **the Department of Academic Competence Development of the University of Latvia**, the functions of which will include the development and improvement of personnel development, career and succession planning systems, the implementation of personnel

development measures, as well as the methodological management of academic personnel management issues by UL departments.

Cooperation with the **student self-government of the faculty**, which represents the interests of students in the operation of the faculty, including solving issues of the academic, social, and cultural environment, plays an important role in the management of studies. The members of the student self-government are represented in **the UL Student' Council**, thus participating in the management of the UL.

The management structure of the study field "Environmental protection" and the corresponding study programmes fully complies with the regulations on the UL's management of the study fields; it is clearly oriented towards the development of the study field. Issues of the SF's development and the quality of studies are regularly discussed in the SF EP Council, which is chaired by prof. Oļģerts Nikodemus. In accordance with the Regulation on the Management of Study Areas of the UL (the UL Senate Decision No 70 of 27.01.2020.), the SF EP Council includes the head of the study field prof. Māris Kļaviņš and directors of the study programmes included in the SF: director of the bachelor's study programme "Environmental science", assoc. prof. Imants Kukuļs, director of the master's study programme "Environmental science", assoc. prof. Iveta Šteinberga, director of the bachelor's study programme "Research and protection of Cultural and Environmental Heritage", assistant prof. Agnese Kukela. The SF EP Council includes also representatives of students in study programmes of all levels, two representatives of employers from state and private institutions, graduates, as well as some representatives of the teaching staff in the field. The Council decisions are made operationally, for example, responding quickly enough to current problems. The management of the SF works efficiently, quickly making decisions related to the provision and quality of studies. The role of head of the SF EP is mainly manifested in the elaboration of development plans of the SF, promotion of the development of study programmes, preparation of annual self-evaluation reports and documents for accreditation process in close cooperation with study directors of all study programmes. These documents are accurately analyzed at the Council meetings. The directors of the study programmes ensure the successful and sustainable operation of study programmes by providing cooperation with directors of other study programmes of other study fields. In the development of the SF, the support of the administrative staff of the UL is of great significance, first of all assistance of the filing clerks and faculty secretaries of the UL FGES and also of the Academic Department, which provides all the needed for the study programmes corresponding to the SF, is highly appreciated. **The technical staff** support 2 elements of the study process: 1) equipment, used materials, collections, cartographic material, etc. maintenance, training on their use in the study process, including field studies; 2) the use of equipment, collections, digital materials for students' research, training students to work with them, especially at development of thesis papers. The technical staff ensures the maintenance and service of the infrastructure necessary for the research work of the academic staff.

The management structure of the SF is clearly oriented towards the development of the study field and improvement of the included programmes included. All decisions regarding the SF development and the improvement of study programmes are made collegially and effectively, allowing a quick response to the trends in the development of natural sciences, the demand of the labour market and the student-centred educational needs.

2.1.4. Description and assessment of the requirements and the system for the admission of students by specifying, inter alia, the regulatory framework of the admission procedures and requirements. The assessment of options for the students to have their study period, professional experience, and the previously acquired formal and non-formal

education recognised within the study field by providing specific examples of the application of these procedures.

Student admission procedures and requirements:

- Terms of Admission at University of Latvia
- Terms of Admission and Criteria for Undergraduate Studies (available only in Latvian)
- Terms of Admission and Criteria for Higher Level Studies (available only in Latvian)
- The Procedures for the Initiation of Studies in Subsequent Study Stages at the University of Latvia (available only in Latvian)

Normative regulations governing recognition procedures:

- Regulations on the recognition of knowledge, skills, competence acquired outside of formal education or in professional experience, recognition of study results achieved in the previous education, and referencing of academic activity at the University of Latvia
- University of Latvia procedure for recognition of competencies developed outside formal education or through professional experience and learning outcomes achieved in previous education

The admission process at the UL and, consequently, also with the study programmes in the study field "Environmental protection" is regulated by *the Terms of Admission at the University of Latvia* and its subordinate orders, which determine the procedures for the given academic year:

1. Admission requirements and criteria for undergraduate programmes.
2. Admission requirements and criteria for higher-level study programmes.
3. Admission procedure for the academic year.
4. Registration fee in the admission.
5. Tuition fees for completion of the full study programme.
6. Number of study places for admission.
7. Procedure for the development of entrance examination materials.
8. Composition of the Admission Committee.
9. Composition of the entrance examination boards.
10. Date and place of entrance examinations.

Requirements and criteria for study programmes are reviewed and updated annually, and according to the Article 46 of *the Law on Higher Education Institutions*, they are published on the UL website by November 1st. Admission procedures vary by study level.

Enrolment in undergraduate studies is centralised through the *Single Enrolment in Undergraduate Programmes System*, which integrates the enrolment in 12 HEI in Latvia. Previous education: secondary education.

The competition for study places is based on the results of the centralised examinations or the secondary education certificate grades of the persons who have acquired secondary education before 2004, who have been exempted from the centralised examinations or have completed their secondary education abroad. In the case of study programmes that do not have relevant centralised examinations, additional requirements for specific grades are set, and the programmes requiring specific skills or aptitude set an additional entrance examination. As a result, applicants are ranked according to their scores. Programmes may provide benefits to national Olympiads and winners of other contests (for more information on admission requirements, see the description of each study programme).

Results of centralised examinations in Latvian, in foreign language (English, German or French) and Mathematics, as well as the final grade in the geography makes up a certain amount of scores with which an applicant participates in the competition for a study place in ABES. For applicants who don't have a final grade in geography in the document for secondary education, final grade of at least two subjects in natural sciences or a grade in a natural science is taken into account. Additional advantages are given to the 1st to 3rd grade winners of the geography Olympiads held at Latvian national or international scale and the 1st to 3rd grade winners of the Latvian State Pupils' Research Conference in the field of earth sciences and environmental sciences or social and economic geography sciences, obtained within the last three years. Additional advantages are also given to honour graduates of the UL's E. Birznieks School of Young Geographers and to the 1st to 3rd place winners of the UL School of Young Environmental Scientists "Environmental Academy", obtained within the last three years. The admission to the academic bachelor's study programme "Cultural and environmental heritage" is proceeded taking into account the results of the centralised examination in Latvian, foreign language (English or French, or German) and mathematics expressed in the total score percentage, as well as the average score percentage of all scores of the centralised examination passed by the person. It is permissible to apply the annual average grade in Latvian language and literature indicated in the secondary education document, summing it with the annual grade in a foreign language indicated in the secondary education document and the annual average grade in compulsory subjects indicated in the secondary education document.

Enrolment in master's degree study programmes is decentralised, at each faculty, but with uniform deadlines. Enrolment is based on grades obtained during undergraduate studies. In programmes that allow for prior education in various fields, the entrance examination is used to determine the correspondence of the candidate's prior knowledge to the field of the study programme.

Previous education: first-cycle higher education or equivalent higher education in natural sciences, environmental science, engineering, agricultural sciences, or forestry.

An entrance examination (entrance interview) is organized for the applicants, where the motivation of the person to study environmental science, understanding of this study field, and the potential topic of the master's thesis are checked.

The conditions for the assessment criteria of the admission competition, the formulas for calculating the competition assessment and the admission procedure are determined in the admission rules of the current academic year of the UL and are published on the UL portal https://www.lu.lv/en/admission/study-programmes/.

AMES enrolls persons, who have First-cycle higher education or equivalent higher education in natural sciences, environmental science, engineering, agricultural sciences, or forestry. Compensatory study courses are offered for persons who are lacking some knowledge and skills in environmental science. The right to apply for the out-of-competition registration are for graduates of the relevant academic year of the bachelor study programme "Environmental science" whose average weighted grade in basic studies are not less than 7 (good) and grade for bachelor's thesis is not less than 8 (very good).

The UL provides an opportunity to commence studies also in subsequent study stages, in accordance with the *Regulations for commencing studies in subsequent study stages at the University of Latvia* (the UL 07.06.2022 order No 1-4/332). A precondition for commencing studies in subsequent study stages is the recognition of previously mastered study courses or knowledge, skills, competence, learning outcomes achieved in previous education, which is regulated by *the Regulations on UL Procedure for Recognition of Competencies Developed outside Formal Education*

or Through Professional Experience and Learning Outcomes Achieved in Previous Education as well as *the recognition and alignment of academic activity* (the UL Senate Decision No 2-3/ 86 of 28 June 2021) (hereinafter – the Regulations) and *the UL Procedure for the Recognition of Study Courses and Knowledge, Skills and Competencies Acquired in Study Courses and Outside Formal Education or Through Professional Experience and Learning Outcomes Achieved in Previous Education* (the UL Order No 1-4/ 543 of 04.11.2021).

Applying to commence studies in subsequent stages, the application must be filled in and the necessary documents must be attached. The UL recognition committee for the recognition of knowledge, skills, competence acquired through non-formal and extra-curricular education or professional experience, and recognition of learning outcomes achieved in the previous education (hereinafter – Recognition Committee) or study programme director, if the student renews studies in the same UL programme, evaluates and recognises previously achieved learning outcomes that corresponds to the learning outcomes in the study courses of the respective UL study programme. Final examinations are not recognised. Recognised learning outcomes are included in the academic obligations fulfilled by the student. Recognition of study courses, recognition of education acquired through non-formal and extra-curricular education, also taking of additional study courses, or taking assessments is a paid service, in accordance with the UL price list of paid services, which is approved annually. The UL evaluates and recognises knowledge, skills, competence acquired through non-formal and extra-curricular education or through professional experience, and learning outcomes achieved in the previous education. During application, documents confirming the achieved learning outcomes must be enclosed/attached – certificates, employer's statements, recommendations, project results, job descriptions, etc. Learning outcomes achieved through professional experience may be recognised only in the part of the respective study programme that contains an internship or as intended learning outcomes in the study course of the study programme or study module, which confirm acquired practical knowledge. In cases stipulated in the Regulations of recognition, the Recognition Committee may ask the applicant to pass assessments required in the respective study course or in its part.

Study course recognition in undergraduate and postgraduate study programme is conducted mainly when students return from international exchange programmes or resuming or continuing studies at later stages after changing or discontinuing studies started at the UL or other HEI. In certain cases, the recognition of professional experience is done in the s programmes by referencing knowledge, skills and competence acquired in the professional activity to the internship intended in the study programme.

On 19.05.2023. in the study field, out of all active students, there were 16 students, who have study courses recognised, however since previous accreditation period on 2015. the recognition was made for 63 students.

In the bachelor’s study programme, the study courses are most often recognized in the following cases: for students returning from an exchange program (Erasmus+ or others); for persons who are matriculated in a bachelor’s study programme and may request to recognize the study courses acquired during their previous studies, if their scope and content are relevant to the study programme with the existing courses. Students have full opportunity to recognize the courses if they have not managed to complete the studies started at another university. In these cases, the recognition commission compares the scope and content of the previously acquired study courses and makes a decision on the possibility of recognizing the study courses. In particular cases, previously acquired study courses are recognized for students who acquire a second or further higher education programme in the study programmes of the study field. For example, if the student has already completed the civil defence course while studying in the chemistry bachelor’s study programme, then, continuing his studies at the academic bachelor’s study programme

"Environmental science", the person is not obligated to take this course a second time. Also, when resuming after a study break, courses are recognized due to changes in the study programme's plan.

In turn, in master's study programmes, recognition of study courses is most often carried out in cases where students have returned from mobility programmes' studies, participated in various projects, such as the summer schools, or have entered this program from other universities of Latvia where they failed to complete their studies. In these cases, the programme's director or the recognition commission compares the volume and content of previously studied study courses and makes a decision on the possibility of recognizing the study courses.

At master's level, the recognition of study courses from previous studies at the academic master's study programme "Environmental science" of the SF is rather an exceptional situation, which confirms that repeat studies in the SF at the master's level (in another study programme) are rare; therefore, there is no need for the recognition of courses. In some individual cases, students reveal the interest in the recognition of the results of so-called summer/winter schools; however, these schools usually provide an insufficient volume of studies.

During the period from 2015 to 2022, in the master's study programme in environmental science, the study courses have been recognized for 21 students within Erasmus+ study programmes (e.g., at the University of Bordeaux, the Norwegian University of Science and Technology, the University of Groningen, the University of Huelva and elsewhere). In addition, every year, on average, study courses are recognized for 1-2 students that have studied within the framework of various summer or winter schools, for example, a study course at the University of Rostock in 2021 (Analysis of Climate Variability). In the bachelor's study programme in environmental science, the study courses have been recognized for 32 students. In total, during the period from 2015 to 2022, the study courses were recognized for 31 master's students in environmental science. At the same time, it should be noted that as a result of the pandemic, student mobility after 2019 has significantly decreased and thus also the relevance of the recognition of study courses. One course has been recognized in the study programme "Research and protection of Cultural and Environmental Heritage".

Offered opportunity by the UL to perform recognition of learning outcomes achieved through non-formal and extra-curricular education, including, continuing education programmes, is rarely used. The recognition of such study results within the SF has not yet occurred.

For the UL students, who study or undergo internship within the framework of various international exchange programmes, the recognition and referencing of learning outcomes achieved during mobility is carried out in accordance with the above-mentioned regulation and procedure regulating recognition at the UL, and the *Procedure for Organising Erasmus+ Programme Mobility at the UL* (the UL Order No1/363 of 18.12.2014). Before going on mobility, the student coordinates the plan of mobility study courses or internship with the study programme director, indicating in it also study courses of the UL, which will be recognised and not required to study after returning to the UL. If changes to this plan are made during the exchange, they are agreed upon with the study programme director. Also, in case of internship mobility, the duration and place of internship, as well as the terms of recognition, are agreed upon with the study programme director. In accordance with the UL regulations, the compliance of learning outcomes achieved during the mobility with the regulations of international exchange programme and requirements of the UL programme are considered in recognition of these learning outcomes. Recognition of learning outcomes achieved and mastered during the mobility is performed by the study programme director of the respective study programme or the Recognition Committee, based on transcript of records from the partner HEI or statement from the internship place. After making positive decision, the recognised learning

outcomes are included in the fulfilled academic obligations of the student.

The mobility of students of the study field within the Erasmus+ programme and other mobility opportunities, can be assessed as high, especially in the bachelor's programme. The restrictions imposed by COVID-19 had a drastic impact on the students' mobility, which has decreased during the reporting period. Apart from the COVID-19 movement restrictions, which were the main reason for the decrease in the number of Erasmus+ exchange students, students' mobility is also affected by the increase in living costs in the host countries and students' reluctance to interrupt their legal employment relationships in Latvia, especially while studying in the master's programme. During the reporting period, students have implemented mobility to various foreign universities. The most popular destination was Germany, but during the reporting period, students were also educated at universities in Sweden, Italy, Estonia and the Netherlands. Application for students' mobility in the Erasmus+ programme is organized centralized within the UL FGES. Information activities for students are carried out, followed by application of students and individual discussions. Priority is given to students with higher academic achievements, as well as to senior year students. Additional new measures have also been introduced to promote students' mobility, as students are introduced to the opportunities provided by the Erasmus+ programme already during the first semester. Solutions are being sought for those interested, including the creation of an individual study plan. In the further development stage of the study programme, changes in the study plan are foreseen to facilitate the planning of students' mobility during the 3rd study year.

2.1.5. Assessment of the methods and procedures for the evaluation of students' achievements, as well as the principles of their selection and the analysis of the compliance of the evaluation methods and procedures with the aims of the study programmes and the needs of the students.

In conformity with *the Law on Higher Education Institutions of the Republic of Latvia*, the UL internal regulation the *Procedure for the Development and Actualisation of Study Courses at the University of Latvia* (the UL Order No 1/277 of 10.08.2018) stipulates that information on the conditions, aim, tasks, requirements for obtaining credit points, study course content, organisation of study process through contact classes, organisation and tasks of the students independent work, intended learning outcomes (knowledge, skills, competence) and their assessment methods and assessment criteria, are included in all study course descriptions, which are available to students in the ULIS and the UL e-study environment. The registration and recording of students' grades are done in the UL e-study environment of respective study course. The UL has formulated the learning outcomes for each study programme and for each study course as a set of knowledge, skills, and competence. Courses in study programmes are developed in accordance with the principles of gradation and succession. To ensure that, the mapping of intended learning outcomes is performed on the level of study programme and study courses – see Part III of the self-evaluation report related to the study programmes.

Starting studies, students are informed of the organisation and implementation of studies in the relevant study programme, but when starting each individual study course, the academic staff informs students specifically about the organisation, content, requirements, intended learning outcomes, study course final examinations and assessment criteria, as well as explains the integral quality of the study course for achieving overarching learning outcomes of the study programme. Students can familiarise themselves with the assessment criteria and conditions and the binding procedures in the study course descriptions and the UL e-study environment, as well as at the

beginning of each course during the first class, when each lecturer introduces students to the course organisation, briefly describes the requirements for interim assessments and study course final examinations, describes grading criteria, assessment and examination procedures, by not changing these requirements and grading criteria throughout the semester.

In the bachelor's and master's study programmes "Environmental Science", the examination methods reflect the interdisciplinary nature of the study programme and are diverse. Final examinations of the study courses are organized as written examination, but the methodological diversity is manifested in interim examination and covers project works, evaluation of laboratory work protocols, preparation of cartographic material, tests, report presentations, essays and other methods. The examination methods at the study programme "Research and protection of Cultural and Environmental Heritage" are currently being adjusted to the conditions covered by the UL resources and the resources of the cooperation partner of the study programme, the Art Academy of Latvia, can provide. In order to ensure the quality of the study process with space suitable for art classes, the UL has concluded a Cooperation Agreement with the Vocational Education Competence Centre "The National High School of Arts" (further in the text – the NHSA). The study process partially exploits also the NHSA methodical materials and objects; however, in the near future, art studies are planned to take place in the auditoriums and studios of the House of Letters at the UL Academic Centre.

The organisation of the study course assessments and the grading of the students' achievements is performed in accordance with *the Law on Higher Education Institutions* and *the Procedure for Organization of Examinations of Study Courses at the University of Latvia* (the UL Senate Decision No 211 of 29.06.2015) elaborated by the UL Constitution and applicable to the assessment of learning outcomes of full-time and part-time students enrolled at the UL study programmes at all levels.

There are two types of assessment in each study course: the interim assessment (the total grade for interim assessments not less than 50% from the total grade) and the study course final examination (grade not less than 10% of the total grade). The study course final examinations may be conducted in writing or orally or in a combined form (written and oral). To assess students' achievements, the form of assessments and methods are chosen in correspondence to the teaching methods used in the study process, during contact classes and in the organisation of students' independent work.

Taking an examination is a mandatory requirement for obtaining credit points for the completion of a study course. The procedures and criteria for the interim assessments are determined by the responsible structural unit. The study course grading is calculated in the UL Centralised Recording System according to the algorithm specified in the course description, considering the grading obtained in the interim assessment(s) and study course final examination, and recorded in the examination report.

Types of interim assessments include quizzes, individual work, practical work, laboratory work, reports, papers, and other types of work according to the profile of the study course. The number and type of interim assessments are specified in the study course description. For the student to receive grading for the completion of the study course, the grading acquired in the study course final examination should be a passing grade. The completion of the course can be assessed as successful even if the study course final examination has been failed, and such possibility is defined in the study course description. The overall grading of course completion is calculated in the UL e-study environment according to the algorithm specified in the course description, considering the grading obtained in interim assessments and study course final examinations.

According to the specifics of the study course, the requirements for attendance of classes may also

be set.

At the end of each study course there is a study course final examination: examination or defence (course work, final project, semester paper, field course, internship). The procedure of defence and assessment of course work, final thesis project, semester paper, field course and internship are stipulated in the UL normative acts.

Learning outcomes are evaluated on a 10-grade scale. If allowed by external regulations, learning outcomes can be assessed as ’passed’ or ’failed’. The course is considered to have been successfully completed, i.e., the grade is positive, if the grade on the 10-grade scale is not lower than '4' (almost satisfactory) or 'passed'. In this case, the student earns credit points for the completion of the respective course.

For the assessment of students’ knowledge, skills, and competence in each study course in the 10-grade system, the study result criteria described beforehand are used. The basis for formulation of criteria is learning outcomes formulated in each study course and explanations of assessments (see Table 2.1.5.1), which is published in *the Procedure for the Development and Actualization of Study Courses at the University of Latvia* (the UL Order No 1/277 of 10.08.2018).

Table 2.1.5.1.

Explanation of the 10-grade system assessments

Level of Learning	**Grade (description)**	**Explanation** *(Pursuant to Cabinet of Ministers of the Republic of Latvia Regulations (hereinafter – the Cabinet) No 305, 240 and the UL Senate Decision No 211 of 29.06.2015)*
very high level of learning	**10 (with distinction)**	knowledge, skills, and competence exceed the requirements of the study programme, study module or the study course and testify to the ability to conduct independent research and deep understanding of problems
	9 (excellent)	knowledge, skills, and competence fully comply with the requirements set for the study programme, study module or the study course and the students possess the ability to use the acquired knowledge independently
high level of learning	**8 (very good)**	the requirements of the study programme, study module or the study course are completely met, though in certain issues the students do not have an understanding deep enough to use the knowledge independently for solving more complex problems
	7 (good)	in general, the requirements of the study programme, study module or the study course are met but occasionally the inability to use the acquired knowledge independently is established

average level of learning	**6 (almost good)**	the requirements of the study programme, study module or the study course are met, but there is a lack of deep understanding of the problem and inability to use the acquired knowledge
	5 (satisfactory)	in total, the study programme, the study module, or the study course is acquired but there is insufficient knowledge of certain issues and inability to use the acquired knowledge
	4 (almost satisfactory)	in total, the study programme, the study module, or the study course is acquired, however, there is insufficient understanding of some basic concepts and there are considerable difficulties in practical application of the acquired knowledge
low level of learning	**3 (weak)**	the knowledge is superficial and incomplete; the student is unable to use it in specific situations
	2 (poor)	superficial knowledge of only some issues; most of the study programme, study module and the study course are not acquired
	1 (very, very poor)	no understanding of the fundamentals of the course and almost no knowledge of the study programme, study module or the study course

The needs of students and the relevance of assessment methods and procedures to the achievement of the objectives of study programmes are analysed and developed, considering the experience of academic staff, by analysing learning outcomes achieved by students and the results of surveys conducted over several academic years. In the surveys, students recognise the importance of clearly formulated intended learning outcomes and defined assessment criteria, as well as the regular feedback on students' achievements in the study process. To ensure this, the academic staff systematically analyse their experience, collaborate with colleagues, analyse students' achievements, and improve course descriptions and e-study environment by developing assessment criteria that corresponds to the intended learning outcomes, thus providing the basis for the assessment.

Evaluating learning outcomes, the basic assessment principles formulated in the regulations of the Cabinet No 240 the *Regulations Regarding the State Standard for the Academic Education* (13.05.2014) are observed:

- **the principle of summing up positive achievements** – assesses by summing up positive achievements of the learning outcomes;
- **the principle of openness and transparency of the assessment** – a set of basic requirements for knowledge, skills and competence is established in line with the aim, objectives and learning outcomes of the study programme as well as the aim and objectives of study courses;
- **the principle of the possibility of reviewing the assessment** – the UL has established the procedure for reviewing the obtained assessment;
- **the principle of mandatory assessment** – it is necessary to obtain a positive grade on completion of the entire study programme content;
- **the principle of the variety of types of assessment used in the grading** – different assessment types are used in the assessment of the study programme;

- **the principle of conformity of assessment** – during the assessment student is given an opportunity to demonstrate knowledge, skills and competence in relevant tasks and situations. The content included in assessments corresponds to the content and achievable learning outcomes specified in the course programmes.

Student performance assessment methods and procedures are evaluated according to the concept of student-centered studies and taking into account the competencies to be achieved and the learning outcomes of each study course. Studies in the field of environmental protection are interdisciplinary and, therefore, assessment procedures and methods differ for courses that ensure the acquisition of theoretical knowledge from courses aimed at applied knowledge and competences. Student evaluation methods and procedures include: 1) evaluation of student feedback (survey results); 2) analysis of the results of each semester's studies will be carried out at the meeting of the council of study directions; 3) periodic analysis of assessment methods and procedures, covering all courses during the accreditation period; 4) analysis of employers' and graduates' evaluation of assessment procedures.

The basic criteria for the assessment of graduation examinations are determined in the *Requirements for Elaboration and Defending of the Graduation Papers (bachelor's, master's, diploma, and qualification papers) at the University of Latvia* (the UL Order No 1/38 of 03.02.2012). Additional criteria may be determined for the assessment of graduation papers, which are approved by the respective Faculty Council on a proposal from the relevant Study Field Council.

In academic master's study programme "Environmental science", the master thesis development is organized in two parts. The first part involves the development and defence of the master's thesis project, which is carried out in the second semester of studies and which ends with grading. The second part is the master's thesis defence at the end of the fourth semester.

At the SF EP, before the defence, all final theses undergo electronic plagiarism checking, therefore, the final theses must be submitted a week before the meeting of the defence committee. The final theses committee is created for each study programme; it is created once a year; its authority involves accepting and reviewing submitted final theses throughout the year. All final theses are reviewed by the final thesis reviewer, who is approved for each student individually by the order of dean of the FGES. The reviewer submits a written review to the final theses committee and expresses the grading on a 10-point scale. On the day of the defence, the student presents own work (10 min. for bachelors, 15 min. for masters) to the final theses defence committee. After the presentation, everyone participating in the defence meeting can ask questions about the content of the final thesis and the presentation. Next, the reviewer introduces everyone present with the evaluation of the work. The defence procedure concludes with the student's closing speech. After all students have defended their final theses, a closed meeting of the final theses defence committee is held, in which the scientific supervisors and reviewers of the students' final theses participate in addition to the members of the committee. The evaluation of the work is expressed firstly by the reviewer, then by the supervisor. These evaluations are of a recommendatory nature. The committee grades the students' final theses, evaluating the content, relevance, relevance, correctness with respect to references, design of the work, evaluating the student's presentation and answers to questions, the discussion ability using field-appropriate terminology. Disputed issues are resolved by open voting of the committee.

2.1.6. Description and assessment of the academic integrity principles, the mechanisms for compliance with these principles, and the way in which the stakeholders are informed. Specify the plagiarism detection tools used by providing examples of the use of these

tools and mechanisms.

The UL in its activity respects the principles of fair and responsible conduct as stipulated in *the Academic Ethics Code of the University of Latvia* (the UL Senate Decision No 2-3/46 of 26.04.2021) and in *the Regulations on Academic Integrity at the University of Latvia* (the UL Senate Decision No 2-3/48 of 26.04.2021); these regulations are publicly available to staff of the UL and its students. During the study process, students are introduced to the concept of academic integrity and the need to follow it in the study process. First of all, these issues are touched upon in the 1st study year in connection with acquiring issues of various forms of studies, mainly to ensure the quality of the preparation of students' independent works, protocols of laboratory work, reports and other types of testing. The next stage is related to the development of students' qualification papers in both the first cycle and the second cycle programmes, for example, in the master's study programme, within the framework of the study course "Master's thesis project".

To ensure compliance with the academic integrity in accordance with *the Regulations for Academic Integrity at the University of Latvia* (approved on 26.04.2021. by the UL Senate Decision No. 2-3/48), UL developed a procedure for verifying the originality of text using similarity detection tools, such as the Turnitin and the Unified Computerised Plagiarism Control System. In accordance with *the Regulations on the Use of Text Originality Verification Tools and Procedure for Plagiarism Detection in the UL* (approved on 09.01.2024 with the Order No. 1-4/12) verification of text originality is conducted in students' study papers, final and doctoral theses, as well as in scientific articles and research developed by the personnel of the UL. The Regulations regulate the implementation of text originality verification and actions taken in cases where signs of possible breach of academic integrity (e.g., plagiarism in accordance with *the Regulations for Academic Integrity at the UL*) are detected.

The UL as the developer of this System and its operator constantly updates the System and provides other HEI with the opportunity to use the System based on a cooperation agreement. In accordance with the cooperation agreement concluded in the 2014, this System is used by seven HEI in Latvia since the beginning: Daugavpils University, Liepaja University, Latvia University of Life Sciences and Technologies, Rīga Stradiņš University, Rēzekne Academy of Technology, EKA University of Applied Sciences and RISEBA University of Applied Sciences. Since 2014, the Alberta College, Baltic International Academy, BA School of Business and Finance, Turība University, ISMA University College, Jāzeps Vītols Latvian Academy of Music, Jēkabpils Agribusiness College, College of Law, Latvian Maritime Academy, Latvian Academy of Culture, Latvian Academy of Culture agency "Latvian College of Culture at the Latvian Academy of Culture", Malnava College, Riga Building College, Vocational education competence center "Riga Technical College", Riga Technical University, State Agency for Social Integration College, Cosmetology College, State Police College, Ventspils University College, Vidzeme University of Applied Sciences, and Academy of Luther has joined in the use of the System; in total the System is being used by 30 HEI.

The system automatically compares the uploaded graduation papers of the UL with study papers of previous years (starting from 2005) from UL and other HEI, and in the event of a certain percentage match, the authorised persons from faculties are sent an overview of these test results, whereby the same text snippets from different authors are simultaneously viewed. The authorised persons pass this information on to the respective study programme director, the appointed supervisor and reviewer for review and, in the event of a suspected breach of academic integrity, pass on the results of the analysis to the respective Graduation Examination Commission for final consideration.

No cases of plagiarism are registered in the study programmes of the SF at the UL FGES; however, the FGES pays serious attention to informing students about the risks of plagiarism, particularly emphasizing the correct formation of references while citing the works of other authors, as well as the accurate application of self-citation.

The cooperation of several HEI in the field of using the System promotes more effective control of study works in each HEI and Latvia overall. This System is a unique collection of study papers in Latvian, it is financially and technologically available to even the smallest of HEI, and successfully performs its functions in practice by promoting the originality of final theses and their quality.

Despite the successful application of the System described above, for University of Latvia as the university of science the direction of scientific activity is always important, e.g., scientific publications, citation frequency and reputation in the international science field where English is the dominating language. Therefore, the essential element in this direction is to verify the originality of the submitted manuscript before publishing in the University of Latvia Press or journals or collections of articles of other academic press, which can be achieved only with such instruments that have access to the restricted or paid databases of international publishing houses. Currently, the only tool in the world that can provide such an opportunity is Turnitin LLC's "Turnitin Similarity" service.

Simultaneously, "Turnitin Similarity" can ensure more of the functionalities that the System maintained by the UL cannot offer due to its architecture and scaling limits, namely, the possibility to integrate the text originality tool into the e-study platform and provide access to the tool for academic staff to verify the originality of regular study papers.

Lastly, text translation and creation technologies, which with the assistance of machine learning and artificial intelligence tools, create new challenges for the verification of the originality of the texts submitted during the study process, are gaining popularity and cause an uproar in the media around the world and in Latvia. Only the collective competence, trained language models and computing power of global companies such as Turnitin LCC allow us to respond to the new language technology challenges effectively and promptly for the study and scientific environment, which is why in the 2022 the UL, after carefully evaluating and testing the solutions available on the market, came to decision on the need to supplement the already existing plagiarism control system with a toll necessary to the academic and scientific community of the UL.

16.12.2022. UL concluded an agreement with the company Turnitin LLC for the implementation and use of the anti-plagiarism tool for the needs of the UL.

2.2. Efficiency of the Internal Quality Assurance System

2.2.1. Assessment of the efficiency of the internal quality assurance system within the study field by specifying the measures undertaken to achieve the aims and outcomes of the study programmes and to ensure continuous improvement, development, and efficient performance of the study field and the relevant study programmes.

The functioning of a sustainable study programme that meets the objectives of the UL study field and study programme is ensured by systematically defining and implementing quality assurance procedures, including continuous monitoring and analysis of the implementation of the study

programme, the use of measurements for the prompt implementation of preventive and improvement measures. The provision of management levels involved in the quality assurance of the study programme allows to implement the programmes in a predefined form according to predefined procedures, reacting promptly to changes in the situation, with quality-related decisions being taken collectively or according to the division of competence. An important methodological tool for quality assurance is *the Quality Management Handbook of the UL*, which identifies in detail the practice of the UL in ESG implementation.

The following activities are the most relevant for the implementation of quality improvement measures within the internal quality assurance system:

- **Regular meetings of the structural unit**, where current issues are discussed, including those related to the study programmes. Academic staff and students participate in the meetings. The issues can be applied by academic staff or students, proposing bottom-up initiatives (new courses, changes in content, etc.). Once a semester, study courses' evaluations and comments are reviewed, deciding on the action. Specific examples are as follows:
    - discussions and decisions on restructuring the content of study programmes during the period between accreditations, according to current issues in the labour market and environmental science;
    - taking into to the students' suggestions, a new study course VidZ3034 "Institutional system of environmental management" has been created with the purpose to introduce with the environmental protection system in Latvia and the EU, including overview on a potential labour market;
    - creation of new courses or transformation of existing courses, proactively following the development trends in the fields, for example, including in the content the issues related to climate policy and technologies, compensatory courses in the academic master's study programme "Environmental science" and others.
- **Regular meetings of the Study direction council**, in which students and social partners are involved, decide on the approval of bottom-up initiatives or the procedure for the implementation of top-down initiatives.
- **Centralized UL solutions.** In addition to the organized and regularly updated base of regulatory acts, the implementation of survey-based solution in digital courses should be highlighted as a particular example. It requires students to provide feedback in order to continue their studies. This action has increased the survey response rate and provides valuable comments that are taken into account regarding described above.
- **Initiatives that have grown into regular events** and promote the exchange of ideas and experiences:
    - the conference "Current issues in the content of environmental education" – annual meeting with representatives of the field, employers and graduates to discuss up-to-date issues in environmental management, solutions and other topical issues;
    - peer observations – regular mutual observation of university lecturers' classes, taking over the experience and providing recommendations in the use of methods. A particularly important tradition is related to maintaining the most valuable methods and approaches not to be lost during the generations change.

In order to ensure the internal quality of the study field, the activities are also carried out, aiming to achieving the goals and results of the study programmes of the field:

- Formal (conferences organized by the study field, compilation of survey results) and informal consultations with graduates, employers, taking into account the suggestions on improving the content of the study field. First of all, the attention is paid to the creation of the offer of

new study courses, the relevance of which is determined by novelties and new challenges in environmental protection in the direction of practical activities and science;
- Research-based adaptation of the study content, primarily taking into account the research work results of the university lecturers involved in the study programme. Therefore, topics on environmental pollution with microplastics, climate change, climate technologies, adaptation to climate change, climate policy, protection of soil resources, modelling of environmental processes, waste management, environmental biotechnologies and other topics are updated within the content of the study programme;
- Topics and approaches identified as a result of international cooperation in the organization of study work, primarily related to the development of remote study methods.

The activities carried out include the actions aiming to reduce student attrition (primarily in the first year of studies in the bachelor's programmes), to increase joint study success, to offer additional opportunities to students, student involvement in research (primarily in the projects implemented by the UL), in application of new teaching methods, in the processes of defence/pre-defence, in the improvement of communication and student information/informing processes, improving surveys and their responses, and using their results, implementing e-studies, including distance learning and their quality control.

2.2.2. Analysis and assessment of the system and the procedures for the development and review of the study programmes by providing specific examples of the review of the study programmes, the aims, and regularity, as well as the stakeholders and their responsibilities. If, during the reporting period, new study programmes have been developed within the study field, describe the procedures of their development (including the process of the approval of study programmes).

Normative regulations, where the procedure and actions that should be followed during the creation and revision process of study programmes are stated in the:

- Regulation of Study Programmes at the University of Latvia (available only in Latvian)
- *The UL Procedure for Preparation of Annual Study Field Reports* (available only in Latvian)

The quality of the study field and its study programmes is managed through a *Plan-do-check-act* or Deming cycle, planning the development and improvement of the field of study over a six-year period, cascading its goals and objectives down to the level of each study programme and regularly monitoring the requirements of stakeholders for effective planning, needs and proponents, in accordance with *the UL Strategy 2021-2027*, taking into account national and international sectoral policies and trends, as well as the impact of global environmental trends on the activities of the UL up to the level of study programmes.

Within the framework of the UL study quality assurance system (see Fig. 2.2.2.1), the development of the study field and the interconnection of study programmes, the establishment of new study programmes, as well as the results of each existing study programme are planned, monitored, evaluated, and reviewed, ensuring the involvement of all levels of the study field management in the quality assurance of studies, as well as representatives of key stakeholders. The review of study programmes is regulated by the procedure established in *The UL Procedure for Preparation of Annual Study Field Reports* (approved by the UL Order No 1/255 of 13.07.2018).

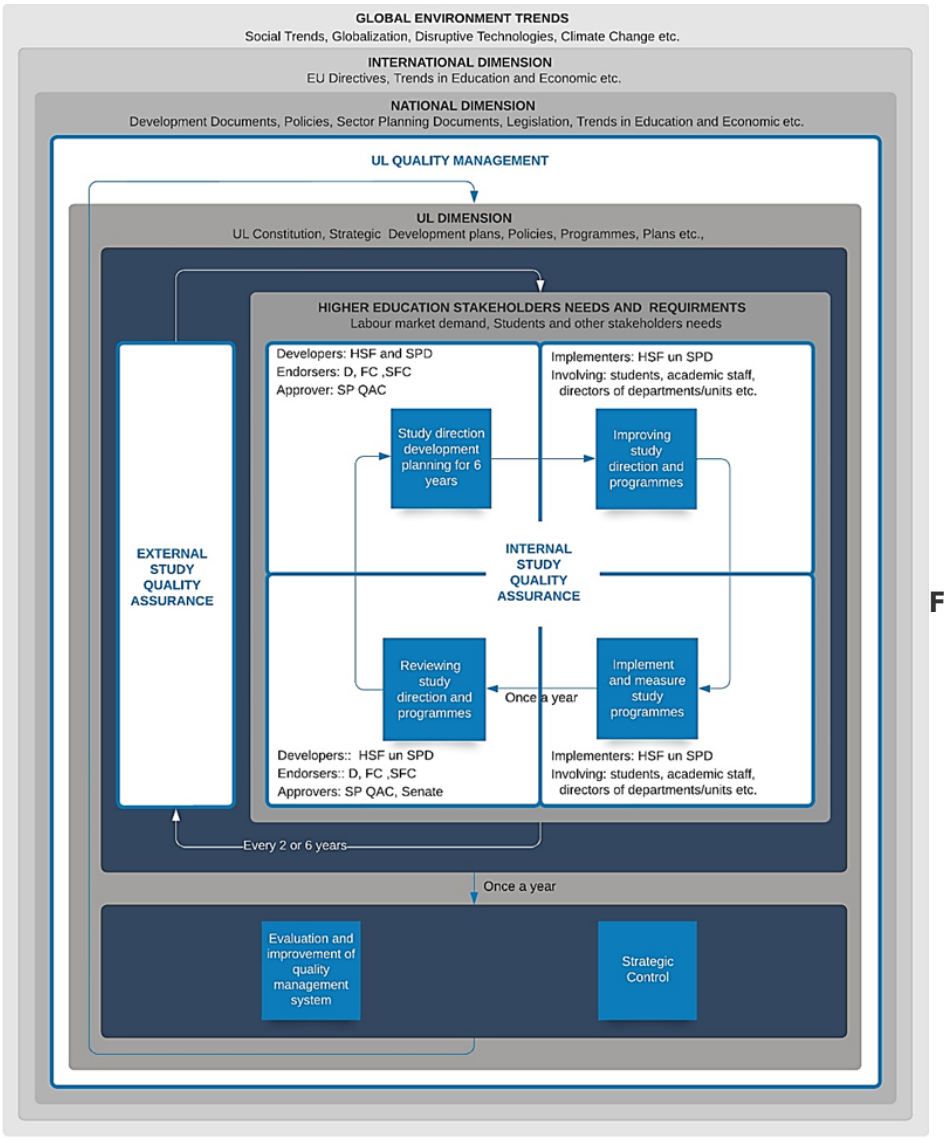


Fig. 2.2.2.1. *The quality assurance system for the study fields implemented by the UL and study programmes included in it*

The development of new study programmes is regulated by *the Regulations on University of Latvia Study and Continuing Education Programmes* (the UL Senate Decision No 102 of 24.04.2017.), it is implemented in several stages, including coordination and evaluation twice at all levels of governance involved in the quality assurance of studies – by coordinating and approving the study programme concept, as well as coordinating and approving the study programme characteristics at the end of the process. For a detailed description of the development of the programme and the content of the concept, see *the Quality Management Handbook*, Section 3.1, Section II. (*The Quality Management Handbook* is available in the section *Other annexes*)

In the process of self-assessment and development of new study programmes, responsibilities are divided between study programme directors, the head of the study field, Study Field Council, Faculty Council, Academic Department, and the SP QAC as well as the Senate.

The UL heads of study fields in cooperation with study programme directors, prepare Annual Study Field Self-Assessment Reports (hereinafter – Self-Assessment Report) every academic year (except periods when the respective study field is involved in the re-accreditation process). Self-Assessment Reports are approved by respective Study Field Council and Faculty Council and submitted to the Academic Department. The Academic Department evaluates the compliance of the self-assessment report with the requirements and directs it for evaluation in the SP QAC composed of all vice-

rectors, the Chair of the UL Senate Academic Committee, the UL Students' Council representative, the UL Alumni Club representative, the Library of the UL representative, the Quality Manager, the Internal Auditor, as well as representatives of the Academic Department and the Department of Study Service. Self-Assessment Reports reflect implementation and development of the study field, and its programmes, quantitative indicators and survey results are analysed, as well as proposals for improvement of the study field are provided. In the process of reviewing the study field, as well as during development of new study programmes, the Academic Department provides an independent expertise and ensures the inclusion of substantiated proposals by the said expert. Accreditation self-assessment reports are prepared using the annual self-assessment results. The recommendations of the Accreditation and Licensing Evaluation Expert Group and the SP QAC are evaluated by the respective Study Field Council, preparing a plan for the implementation of expert recommendations, which is agreed with the SP QAC. More information on the content of the self-assessment of study programmes and the process of ensuring external accreditation in Sections IX and X of Chapter 3.1 of *the UL Quality Management Handbook*.

During the preparation of the annual self-assessments of the SF EP, great attention is paid to the deficiencies identified. It involves the indications identified in student surveys about the study courses and satisfaction with the study programmes in general, as well as the instructions from the Academic Department and expert reports on self-assessment.

The mapping of knowledge, skills and competences related to the courses of the bachelor's study programme reveals that the courses of the programme ensure the achievement of all study results of the programme; furthermore, the defined learning outcomes of the courses are distributed proportionally and similarly across all groups of study results. In general, 34% of the study courses learning outcomes are aimed at achieving the knowledge as study results of the study programme, 37% of the learning outcomes help to achieve the defined skill goals of the study programme, while 29% of the courses defined goals the achievement of competency as a study results are ensured. The most study courses learning outcomes (19% of cases) ensure the achievement of the knowledge as a study result "*Understands current trends, processes and their influencing factors in matters related to environmental science and environmental protection*", while the least (3%) ensures the achievement of the competence as a study result "*Develops research in the chosen field of environmental science, promoting the development of environmental science*", which is implemented in some specific courses as "Field methods in environmental science", "Field methods in environmental and Earth sciences", "Bachelor's thesis – the project" and "Bachelor's thesis".

The mapping of knowledge, skills and competences related to the courses of the academic bachelor's study programme "Research and protection of Cultural and Environmental Heritage" demonstrates that the courses of the programme in general ensure the achievement of all learning outcomes of the study programme. Defined studies learning outcomes of the study courses are distributed proportionally and similarly across all studies learning outcomes groups. In general, 33% of the learning outcomes of the study courses are aimed at achieving the knowledge as a learning outcome of the study programme, 34% of the learning outcomes help to achieve the defined skill goals of the study programme, while 33% ensure the achievement of competence as a learning outcome of the defined goals of the courses. The most of the learning outcomes of study courses (28% of cases) ensure the knowledge learning outcome "Comprehending the fundamental principles of the environmental sciences' theories, regularities, and types of natural and environmental resources and orienting in the fundamental problems of ecology and material science" and "Conversant with the basic sets of facts, ideas and findings of art history, environmental history and social history in the context of cultural heritage theories", but the least (6%) is provided with the knowledge as a learning outcome "Conversant with the requirements for evaluating and documenting cultural and environmental objects and the basic methods of

visualizing objects", which is achieved with two study courses specifically focused on this knowledge – "Digitalisation methods of cultural and environmental heritage" and "Data analysis and vector graphics in cultural heritage field", as well as with other knowledge learning outcomes, they are provided in six more courses of the study module "Theory and methods of environmental and cultural heritage".

In the master's study programme, the knowledge, skills and abilities acquired in individual study courses vary from 6 to 10, they are balanced and adequately ensure the achievement of all the goals set in the programme. The majority (most often) of the study learning outcomes (40%) ensure the achievement of the knowledge as a learning outcome "*Capable to demonstrate in-depth knowledge of the theories, concepts, methodologies of a sub-field of environmental science*", while less pronounced attention (28%) in the study courses is paid to the improvement of competences by acquiring such competences as "*Argumentatively explains and discusses integrated or systemic aspects of the field of environmental science with both specialists and non-specialists. Capable to work in a group, present and argue own point of view, reach a compromise in formulating the group's point of view*". It should be mentioned that this competence, which is relatively rarely mentioned, can be acquired in several, both mandatory and restricted elective study courses, for example "Environmental planning", "Biotechnology and environmentally friendly technologies".

The summary of study courses' surveys allows evaluating the content of study courses, the study methods used by the teaching staff to achieve the study results, as well as the contribution of a specific study course to the results of study programmes. Every semester, study courses with a low rating are intensively evaluated in the UL Department of Environmental Science, paying special attention to those study courses with repeated low ratings. The duty of every teaching staff member is to get acquainted with the students' comments and critically evaluate where the improvement is needed. If a study course has a low rating for a long time, then the opportunity to replace the teaching staff is usually sought.

Surveys on overall satisfaction with the study programmes reveal the students' opinion on the composition of study courses, which must ensure the achievement of certain study programme results. These surveys are one of the factors causing the changes described further in the text regarding the study programmes' characteristics at their changes.

If the comments of the Academic Department are related to inaccuracies in the content of the self-assessment, that must be corrected, then the recommendations of the independent expert of the Academic Department may also contain the elements for the improvement of the study programmes. The reaction to these recommendations is fixed in the development plan of the study field as specific tasks with activities, responsibilities and due dated.

Examples of specific tasks formed during the self-assessment evaluation process (taken from the Self-Assessment Report of 2021) can be listed as follows:

- In January 2021, the course Ģeog1018 "Maps, remote sensing and GIS" was excluded from the bachelor's study programme, replacing it with the course Ģeog1042 "Fundamentals of spatial analysis in environmental science", ensuring the relevance of the study courses to the acquisition of skills and abilities necessary in the environmental protection, and, at the same time, replacing the university lecturer of the course.
- A study course led by the academic master's study programme "Environmental science" director has been created in the volume of 12 academic hours on the use of the Moodle system in the distance learning process, and is offered to university lecturers.
- Students are introduced to the opportunities of applied studies both in the study course "Introduction to environmental science" and at the beginning of the 3rd semester, when being introduced with the study content in the second year of studies. Director of the bachelor's

study programme, assistant prof. I. Kukuļs, participates in the meetings of the study direction Council, where issues of updating the study content are considered.
- In accordance with modern development trends, the study course on environmental biotechnologies has been updated, the latest scientific discoveries are included in the study course on waste management.
- Students' grading of study courses undergoes regular monitoring in order to promote their high grading (for example, in 2020/2021, the grading of every course was not lower than 5.8 points).

Changes in the study programme and its implementation methods were caused by the COVID-19 pandemic, as well as by the subsequent energetics crisis in 2022/2023. The changes were first of all related to the process of the programmes implementation and the need to ensure students' practical work skills, performance of laboratory work, as well as control of students' work and a significant expansion of the offer in e-studies. The changes included producing of lecture recordings placed in the e-studies environment, development of new methodological approaches for ensuring the remote learning process, the development of new communication forms intended for advising students.

2.2.3. Description of the procedures and/or systems according to which the students are expected to submit complaints and proposals (except for the surveys to be conducted among the students). Specify whether and how the students have access to the information on the possibilities to submit complaints and proposals and how the outcomes of the examination of the complaints and proposals and the improvements of the study field and the relevant study programmes are communicated by providing the respective examples.

UL, in keeping with the principles of democracy and equality, and in line with *the UL Quality Assurance Policy*, in all stages of the study process, ensure the participation of applicants and students in the evaluation of the UL study process. In matters relating to the admission procedure, UL applicants have the right to lodge complaints with the Chairman of the Admission Board.

The right of UL applicants to lodge complaints regarding irregularities in the admission procedure are governed by the *Terms of Admission at University of Latvia* (the UL Senate decision No 2-3/68 of 31.05.2021), specifying the procedures for the lodging, processing, and appeal of the complaint.

However, to improve the quality of studies, students have the right to submit proposals and complaints concerning the study process and quality, the quality of material supply, duty fulfilment of the UL employees, service culture and cooperation, as well as dishonest or unethical actions from the UL employees.

Regulations on lodging and review of students' proposals and complaints at the University of Latvia (the UL Order No 1-4/501 of 28.09.2022.) (hereinafter – the Procedure) defines the form in which students, individually or in a group, can submit proposals and complaints, as well as its registration and reviewing order. Proposals and complaints can be submitted to faculty deans or vice rectors (in case they concern the deans work or if the submission may unfavourably influence the future of studies). The Procedure stipulates that replies to proposals and complaints are to be submitted within the deadline set in *the Law on Submissions*. It should be noted that this Procedure states that faculty deans and vice rectors submit the report on received proposals and complaints, as well as the decisions made regarding them in the previous academic year, to the UL Quality Manager by

the end of each academic year. The UL Quality Manager assesses those reports, analyses tendencies, and prepares report to the Management of the UL. The established process demonstrates the internal control mechanism and cyclic monitoring of submission of complaints, decision making, respect to students' rights and interests, which is essential in ensuring acceptable functioning of this system as well as its possible improvement.

Students are informed about the procedures for submitting complaints and proposals in the study course, which provides information on the introduction to studies and study procedures. In order to facilitate student communication in case of claims, the representatives of the student self-government, participating in the meetings of the field of study, Environmental Ccience Department, are asked to act as mediators in problem situations and to ensure that every students' opinion is heard. Any proposals and complaints are considered at the sessions of the study field council.

The Procedure for the Organisation of Study Course Examinations at the University of Latvia (the UL Senate Decision No 211 of 29.06.2015) has been developed and implemented for the comprehensive evaluation of UL study processes, where the right of students to file complaints regarding the procedures for study course interim assessments and study course final examinations, and the procedures for resolution of these complaints have been determined. The complaint is submitted by the student to the member of teaching staff who has evaluated the study course final examination within five working days from the moment the grade is inputted in the ULIS (on condition that the student has requested a justification for the assessment from the academic staff prior to submitting the complaint). The lecturer must review the application within 5 working days. If the lecturer considers that the student's application is not substantiated, they may submit the application to the respective head of structural unit for consideration and decision.

Regarding the evaluation of graduation examinations, *Regulation on graduation examinations at the University of Latvia* (the UL Senate Decision No 183 of 27.12.2011), which stipulates that the students are entitled to appeal if the dean has not given them permission to take the graduation examinations or to appeal against the graduation examination procedure.

The UL also has an Academic Court of Arbitration, whose regulations provide for the opportunity to apply to this collegial institution for any study-related issues, including control over adherence to the principles of assessment.

The students have the right to appeal against the UL order on the exmatriculation in conformity with the *University of Latvia state budget subsidized study place competition (rotation) procedure* (the UL Senate Decision No 381 of 24.05.2010). In its turn, *the Study Fee Relief Procedure* (the UL Order No 1/89 of April 14, 2009) provides students with an opportunity to appeal against decisions on granting or refusing tuition fee discounts within one month from notification issued to the student by submitting a written application addressed to the Rector of the UL, to be considered by the Rector within one month.

Whereas *the Procedure for Granting an Academic Leave of Absence in the University of Latvia* (the UL Senate Decision No 178 of 01.12.2008) provides for the right to appeal against the decision of the dean refusing to grant a student the academic leave of absence. Also, *the Procedures for the Initiation of Studies in Subsequent Study Stages at the University of Latvia* (the UL Order No 1/128 of 08.06.2009) provides for the right to appeal within a specified period against the decisions made by the dean.

In compliance with the rights of students also outside the study process, for those students who use the UL student hotels, *the Internal Regulations of the Dormitories of the University of Latvia* (the UL Order No 1/171 of 30.06.2009) define the rights and obligations of students, including the right to submit complaints about problems in student hotels. These issues are addressed by the superior of

a student hotel.

Every student has the right not only to use the right provided by *The Academic Ethics Codex of the University of Latvia* (the UL Senate Decision No 2-3/46 of 26.04.2021) to address the Academic Ethics Committee of the UL about possible ethical violations, but also to submit proposals for improvement of the Code and its implementation to the Academic Ethics Committee of the UL.

The proposals and complaints are registered with the departments or commissions where they are submitted, as well as outcomes of the enquiry taken and respective resolutions.

At the normative level, *the Regulations on Visiting Students from the Latvian Higher Education Institutions* (the UL Order No 1/17, 25.01.2006) have defined the principle that visiting students also have the same rights and obligations as students at the UL, which means that the system of submission and consideration of complaints and proposals is applicable to these students.

It follows from the above that the centralised segment of the UL complaint and proposal submission and review system covers all the components of every student study life as it applies to enrolment at the UL as well as the full-cycle studies, final examinations, etc.

The rules and procedures exist for submitting students' proposals and resolving complaints, and considering students' appeals. Students are informed about these procedures by the programme director when starting the studies. The results of student surveys are evaluated and taken into account in the improvement of the study process. Students willingly express their suggestions for the improvement of study programmes and processes in the discussions with university lecturers and programme director.

2.2.4. Provide information on the mechanism for collecting the statistical data, as developed by the higher education institution/ college. Specify the type of data to be collected, the regularity of collection, and the way the information is used to improve the study field. Describe the mechanism for obtaining and providing feedback, including with regard to the work with the students, graduates, and employers.

To control, analyse and forecast the dynamics of the number of students, the UL collects data on:

- characterising number of applicants and matriculated students and their profile, such as secondary education institution, year of graduation, assessment obtained in secondary education examinations, age, gender, previous higher education and the assessment obtained in its examinations;
- number of students, broken down by faculties, study programmes, study levels, study years, forms and types of studies, source of financing for studies, status of studies – exmatriculated as having not completed the academic obligations, exmatriculated as having not settled the financial obligations, exmatriculated as a degree holder (graduate), on academic leave of absence.

To control the progress of student's studies and the implementation of the programme, the UL collects data on:

- interim assessment and final examination of student's study courses, broken down by type of assessments, final results of final examinations, weighted average grade; data are collected once a semester;
- completion of the study programme, in accordance with the requirements set for the

acquisition of the programme, broken down by study semesters, parts of the programme (Compulsory part, Restricted elective courses, Elective courses and others, according to the structure of the programme); data are collected once a semester;
- students' academic debts in credit points by study semesters, parts of the programme, study courses; data are collected once a semester;
- fulfilment of the tuition fee schedule provided in the student agreement, broken down by study programmes and semesters.

To obtain information for planning and efficient use of study resources, the following statistical information is collected in connection with study programmes:

- financing of study places, broken down by state-funded, the UL funded and student-funded study places;
- the number of student scholarship recipients and the number of study and student loans.

To prevent violations of the principles of academic integrity in the UL students' graduation papers and promotion papers, the UL ensures automatic review of all submitted graduation papers and promotion papers using the System, making a mutual comparison with the graduation papers of the UL and other HEI accumulated in the System.

No cases of plagiarism are registered in the study programmes of the SF EP; however, the UL FGES pays serious attention to informing students about the risks of plagiarism, particularly emphasizing the correct formation of references while citing the works of other authors, as well as the accurate application of self-citation.

To evaluate the satisfaction of students, graduates and employers with the study quality and its results, as well as to implement the necessary improvement measures, the UL regularly organises and compiles data from the following surveys:

- a survey on study courses and work of teaching staff;
- a survey at the start of studies;
- a survey of first-year students on study experience;
- a survey of final-year students on study experience;
- a survey of students, who discontinue studies;
- graduate survey;
- employers survey.

A survey on study courses and work of teaching staff is implemented in the ULIS every semester and is for all students (including internship study courses). With this survey the UL can learn the students’ opinion on the content of relevant study courses in the specific semester and provides assessment of the teaching staff’s work. The information obtained through this survey helps to improve the study process, eliminating imperfections and improve the study quality.

A survey at the start of studies takes place in the ULIS once per academic year. With this survey the motivation of students in choosing the university and study programme; sources of obtaining information about studies at the UL are ascertained, as well as the assessment of application and registration process is obtained. This survey helps the UL to build communication with potential students in the coming years, and to improve the admission process.

A survey of first-year students on study experience takes place in the ULIS one per academic year to learn students’ opinion on different study aspects and on what support is necessary when starting studies. Thus, the information is obtained for improvement of study environment and promotion of student adaptation.

A survey of final-year students on study experience takes place once per academic year.

With this survey the assessment of potential graduates on further development of the study programme, improvement of study process, quality and study environment is ascertained.

To ascertain main reasons for study discontinuation and to promote the decrease of student dropout rate, **a survey of students, who discontinue studies** is conducted. The survey is conducted in the ULIS throughout the academic year.

The aim of **the graduate survey** is to collect information about the professional activity and further course of life of graduates, as well as to ascertain the opinion of graduates on the acquired education in the UL. The aim of **the employers survey** is to find out the opinion of employers on the knowledge, skills and competence acquired by the graduates of the UL correspondence with the requirements of the labour market, as well as to obtain proposals for the improvement of the study quality. Surveys at their discretion are organised by programme directors using prepared surveys by the Academic Department.

Most of the regular surveys–survey on study courses and work of teaching staff, a survey at the start of studies, and surveys on study experience–results are gathered in two ways: (1) The summary of survey results for each study programme is generated separately, automatically by the ULIS; (2) The summary of surveys (except the survey on study courses and work of teaching staff) results on the UL as a total and on faculties is prepared by the Academic Department after the conclusion of the survey process, and they are published on the *My Portal*. The summary of a survey of students, who discontinue studies, results is prepared by the Academic Department, and they are published on the *My Portal*. However, the summary of graduate survey and employers survey results is organised at their discretion by study programme directors.

Survey results published on the *My Portal* are available to every student and employee of the UL with the username and password assigned to them. However, accessibility of the summary of survey results on the ULIS is different for various user groups. Moreover, similarly as students' grades some of the survey results, for example, assessment of study courses and work of teaching staff, is restricted access information.

Surveys on study courses and work of the teaching staff are fully available to each respective member of teaching staff about their own implemented study course; to programme directors – about teaching staff and heads of teaching staff departments (head of department or subdepartment, head of study field, vice-dean, and dean), as well as the UL SC and student self-governments of faculties.

The rest of surveys–a survey at the start of studies and surveys on student experience–summaries of results about their own study programme are available to students and programme director; on study programmes attached to the position – head of department or subdepartment, head of study field, vice-dean, and dean. Summaries of survey results on their own faculty are fully available to student self-governments of faculties, and on all study programmes to the UL SC.

Each year the head of the study field in cooperation with the study programme directors prepares a report on the operation of the study field and the programmes therein during the academic year. In the preparation of the report, statistical data is collected and analysed, and the obtained information is used for the evaluation and improvement of the study field. The report includes the following data, which are collected and analysed annually:

- number of students in programmes, showing the total number, number matriculated in the first academic year, number of graduates, dropout rate, separately identifying different forms, types and languages of study;
- outcoming and incoming mobility of students, their participation in exchange programmes;
- composition of the teaching staff, indicating the position, number of academic staff with a

doctoral degree, mobility of teaching staff;
- the ratio of students to teaching staff;
- the number of employers in the sector involved in the implementation of the programme;
- summary and analysis of the results of a survey of students about the courses and the programme.

The content of the study programme is made up of the study courses; therefore, the SF EP pays great attention to the results of the survey on study courses. Each member of teaching staff is able to view the evaluation of own study course, but the director of the study programme has access to the results of all study courses of the study programme. The maximum rating in each of the criteria is 7 points. Every semester, the directors of the study programmes collect the assessment of the study courses expressed by students, get acquainted with the comments on each study course, and in case if the assessment is lower than 5 or if any problems are indicated in the comments, perform negotiations with the relevant teaching staff about the content-related improvements of the study course or the study quality problems. In some cases, the results of the study course survey have served as the basis for changing the teaching staff of the study course. The director of the study programme presents the results of the study course survey to the respective students, and the issue undergoes discussion at the meetings of the Departament of Environmental Science and the SF EP Council. In point 2.3.3 of the SF EP Development Plan indicating “Improving the course content and teaching quality in study courses” as an indicator is pointed out an achievement (expressed in percentage) of a higher number of study courses with an average rating higher than 5.5. The results of the survey on study courses in relation to the rating with 5.5 in the period from the fall semester of 2016 to the fall semester of 2022 are summarized in the Annex (before the fall semester of 2016, the survey was voluntary, therefore, a small number of students completed the survey). The improvement in the study courses evaluations is observed over the past two years.

Independently apart from the UL study courses surveys, the students’ self-government of the UL FGES organizes inter-semesters surveys on the quality of study courses and content. Thus, the problem situations can be recognized in the middle of the semester and a timely solution can be found to solve them.

Annexes 7 and 8 contain the results of the surveys performed by students, graduates and employers for the bachelors of environmental science and masters of environmental science studies programmes. The surveys were conducted in 2022.

The SF EP graduates approvingly rate the acquired skills to analyse information, act independently, as well as the acquired knowledge in environmental science. The competence of the teaching staff is appreciated. However, also remarks and recommendations for improving study programmes are indicated serving a valuable element of feedback. Based on the students’ recommendations and also taking into account the opinion of the academic staff and employers, the recommendations are incorporated into the study plans and the structure of the study programmes being directed to accreditation. Thus, for example, in both bachelor’s and master’s study programmes, when forming the planning of elective courses, it is possible to specialize in a sub-field of the science. Graduates give recommendation to allow students of the study programmes to undergo an internship – applied studies, which can be carried out both in the field-related enterprises, state administration institutions, as well as in the UL and other institutes. When updating and developing new study courses, attention has been paid to the opportunities of solving practical tasks, thus preparing students for professional activity.

The employers survey reveals similar trends as the graduates’ survey. Most of the employers admit that, in general, when characterising the SF EP graduates working in the company (those who received their education in the last 3 years), they were able to perform their work duties after a

short training/introduction to the workplace. Analyzing the results of the employers survey, it was observed that graduates are capable to work with information technologies, geographic information systems, have an understanding of the legislative system, have the ability to learn new knowledge and skills, are capable to adapt to new conditions (changing work environment), but not all of them are able to plan, manage and organize other work, make decisions and justify them, as well as work independently, determining work methods and due dates. The survey reveals that the SF EP graduates are more competitive compared to graduates of similar programmes at other universities.

In the last year of studies, the students' satisfaction rating regarding the corresponding study programme is high. 90% of the master's programme students admit that they are satisfied with their choice of study programme. This rating reveals that the study programmes are not perfect, but the rating is high enough and provides opportunities for improvement and development.

2.2.5. Specify the websites (e.g., the homepage) on which the information on the study field and the relevant study programmes is published (in all languages in which the study programmes are implemented) by indicating the persons responsible for the compliance of the information available on the website with the information published in the official registers (State Education Information System (VIIS), E-platform).

The target audience of the UL website https://www.lu.lv/en/ (hereinafter – the Website) is the UL prospective and existing students, employees, cooperation partners, scientists, and the public.

The Website is intended for access to and storage of public information, providing its visitors with an opportunity to familiarise themselves with the UL's activities as reflected in the digital environment on the internet.

The Website consists of the following sections:

- ROTATING NEWS – essential information of the UL through the visual identity of the UL, which has certain parameters and strengthens the image of the University and promotes its visibility in the digital environment.
- NEWS AND EVENTS – current affairs and planned events at the UL. The information is prepared by the Department of Communication in coordination with other UL structural units.
- DISCOVER UL – Information about studies, extracurricular activities, science.
- STUDIES – with subdivisions:
    - College study programmes;
    - Bachelor's study programmes;
    - Master's study programmes;
    - Doctoral study programmes.

The information is prepared and posted on the Website by the Department of Communication in cooperation with the Academic Department and the Department of Study Service.

The STUDIES section in Latvian provides information on programme goals, objectives, learning outcomes, programme volume and duration, programme study language, information on job opportunities after graduation, as well as programme study plans. In case of questions, contact information is provided for further information. This section also publishes study-relevant information under the heading STUDY PROCESS – academic calendar, lecture timetable, tutorials, key documents and sample forms, information on mobility at HEI, recognition of

experience/education, lifelong learning opportunities as well as references to the UL e-study environment and the ULIS.

The section contains information about the offers of the Library of the UL, information of the Career Centre, activities of the Students' Council.

The two subsections STUDENT LIFE and EXTRACURRICULAR ACTIVITIES inform both existing and prospective students about student hotels, catering, parking and bicycle parking, mentor support, and information for people with disabilities. There is a wide range of information on how to enrich one's extra-curricular life with sport, culture.

The ADMISSION section contains information for pupils, prospective and existing students. In this section, the pupils can get acquainted with the events and creative competitions organised by the respective faculty, the participation wherein and successful performance can give additional admission points. The prospective students may be introduced to the information on all levels of programmes, admission requirements, loans, and scholarship information, as well as opportunities for the renewal of studies on the Website. The prospective students will be able to familiarise themselves with the most frequently asked questions and answers, information on the Career Centre activities, preparatory courses, and classes for pupils.

Other Sections – *Science*, *Cooperation*, *About Us,* provide more information about the UL activities in research, projects, conferences, cooperation partners, normative acts, strategy, etc.

The Website www.lu.lv/par-mums/dokumenti/pasnovertejuma-zinojumi/ (available only in Latvian) contains Annual Study Fields Self-Assessment Reports and overviews; regarding the SF EP, they are accessible in the section "Geography and Earth Sciences", respectively.

The Websites of the structural units (faculties) prepare information on the programmes offered by the respective faculty and on the scientific activities of the faculty. Content blocks are the same as the ones on the UL official site, but more specific information is posted directly about the respective faculty activities.

Respective faculty website can be reached from the UL Website via the faculty reference https://www.geo.lu.lv/en/.

If the text to be posted on the Website is submitted in a language other than English, a translation of the text into Latvian or a brief summary should be attached.

The heads of the UL departments are responsible for the preparation, correctness and updating of the information within the competence of their departments. The content administrators of the structural units' websites are responsible for maintaining the website, posting and regular updating of prepared information. For a given faculty, the person responsible for content placement is the marketing or public relations specialist or coordinator who administers the existing website, or an employee who has completed a short TYPO 3 content placement course in the Department of Information Technology.

From the UL website, via the faculty reference, through the banner of the UL FGES, the website of the Department of Environmental Science https://www.geo.lu.lv/en/about-us/department-of-environmental-sciences/ can be accessed, where current information is gathered. Information on the page of the Department of Environmental Science is available in Latvian and English and is grouped into the following sections: "Current news", "I want to study", "For students", "Research", an additional event calendar and contact section are available. Information about study opportunities is summarized in separate informative blocks (under the "Admission") grouped as: "Bachelor's study programmes" and "Master's study programmes".

The sections contain grouped information about the offer for students of various levels, prospective students and pupils, as well as graduates. In the section “I want to study at the UL FGES”, information is available on the all-level programs provided by the faculty, as well as on classes and schools of interest for secondary school attendees, open days and opportunities to get acquainted with the faculty’s study life, as well as a special section “Continuing education”.

Current study information is available in the section “Studies” – schedules of lectures and classes, information on scholarships, studies abroad. Links to e-studies, library, sports opportunities, information about dormitories and cultural events at the UL are provided. Useful resources, examples of various applications, internships and job offers are also available.

The section “Research” contains information on the research structural units, a total of 10 structural units, research projects and particular conferences in the field.

In the section “About us”, information about the faculty’s departments, employees and university lecturers is available. The information about the Students Council is also available. This section also contains a summary of the faculty’s reflection in the public media, the official logo and visual materials.

2.3. Resources and Provision of the Study Field

2.3.1. Provide information on the system developed by the higher education institution/ college for determining and redistribution of the financial resources required for the implementation of the study field and the relevant study programmes. Provide data on the available funding for the scientific research and/or artistic creation activities, its sources and its use for the development of the study field.

The system of the UL for financing the study field and the corresponding study programmes is based on *the Law on Higher Education Institutions*, the Cabinet Regulations No 994 of 12.12.2006 *the Procedures for Financing Higher Education and Colleges from the Funds of the State Budget*, No 445 of 05.07.2016 *the Regulations Regarding Remuneration of Teachers* and other external and internal regulatory enactments.

For the successful implementation of study fields, the UL must ensure sufficient financial resources for the entire study process, including the remuneration of the teaching staff, the library and other resources related to the implementation of studies, as well as the development of the study programme. The main costs related to the implementation of the study process are the remuneration of the teaching staff and the costs related to the organisation of the study process.

The remuneration of the teaching staff includes:

- Costs of contact hours (e.g., lectures, seminars, practical and laboratory work).
- Independent work management, consulting, and examination costs.
- Costs of methodical work (preparation for classes, preparation of new courses, etc.).
- Student work management and evaluation costs, including reviewing.
- Internship management and organisation costs.
- Costs of scientific work of the teaching staff to ensure the development of new study materials.

With the UL Rectors Order the norms of the formation of the remuneration of the teaching staff are determined in the *Planning and Accounting Regulations for Academic Personnel's Workload* (the UL Order No 1/469 of 07.12.2016). Considering the specifics of studies and available resources, the management of the faculties may set different regulations in coordination with the vice-rector of the respective field.

Costs related to the organisation of the study process:

- General staff costs include the costs of study support staff remuneration, organisation, and provision of faculty activities.
- Other costs are other direct costs related to the specific study programme, such as rent of external services, premises, additional equipment lease, transport lease, etc.
- Infrastructure costs – costs of premises, including utilities, repairs, and maintenance.
- The costs of property and services include the material and methodological provision of the study programme, including technical equipment, visual materials, professional development (experience exchange trips, training), etc.
- Indirect costs include the costs of the University's overall operational support (IT, finance, personnel, marketing, etc.) and investment in development.

To estimate the amount of funds required for financial provision, the UL calculates the prime cost of each study programme according to the methodology developed by the UL, which takes into account all the costs of providing the study process described above and information on the specific study programme plan, involved teaching staff, planned number of students, and other aspects, thus ensuring the reliability of the forecasts.

Financing of studies at the UL – sources of financing

To provide the necessary funds for the study process, the UL uses (1) the state budget subsidy (considering the base funding, programme level and field of study) from the Ministry of Education and Science and (2) tuition fees.

Tuition fees at the UL are determined considering:

- the prime cost of the study place, taking into account all the costs of the study process;
- tuition fees for similar programmes at other HEI;
- the interest of prospective paid students in the study programme;
- the estimated financing of the study place from the state budget;
- the opinion of the UL Students' Council.

Tuition fees are set at the end of each year for the next academic year to ensure timely availability of information. Fee for the student does not change during the studies, unless the fees vary from year to year in the programmes, but even then, they are all determined at the beginning of the studies.

Income from lifelong learning or other services, as well as accumulated unit funds, may also be used for curriculum development (development of new courses, improvement of existing courses, methodological support, and other curricular aspects). If necessary, financial support can be obtained from the UL Study Quality Improvement Fund, where a sum is set aside annually in the UL budget to address various faculty issues, including the development of new study programmes and the development of existing study programmes.

Indirectly, research funding sources for academic staff are also channelled to the development of study programmes, e.g., for research activities, participation in international projects, publication of scientific articles, preparation of international project applications, organisation of scientific events at the UL, implementation of research development projects and fulfilment of long-term

commitments, etc. By participating in these activities, academic staff increase their professional and research competence, often also involving students, which has a positive impact on the quality of the study process.

For data on available funding for a specific study programme, see the characteristics of study programmes in sections “Provision of Resources and Support for Study Programme” related to the SF EP, respectively.

Financing of studies at the UL – reallocation of received funding

All income received from the state budget and tuition fees, as well as from other sources are used for financing the study process, after prior deduction of indirect expenses for centralised expenses in accordance with the current redistribution procedure, the UL allocates for use by the faculties.

Faculties independently manage received funding within the current year's budget. The dean and the executive director of the respective faculty are responsible for the rational use of financial resources and performs operational financial management.

Actual returns are recorded at the faculty level, without separating results for each programme or study field. At the same time, the management of the faculty monitors the outcomes of the study process, the dynamics of the number of students and the factors influencing it, the balance of the prime cost of a particular programme with the state budget subsidy and tuition fees and, if needed, makes the necessary adjustments in the organisation of the study process to ensure the long-term viability and development of the study field of the faculty.

2.3.2. Provide information on the infrastructure and the material and technical provisions required for the implementation of the study field and the relevant study programmes. Specify whether the required provision is available to the higher education institution/ college, available to the students, and the teaching staff.

During the reporting period, the bachelor’s and master’s study programmes in the SF EP were formed mainly by the common infrastructure base of the UL FGES. The most significant improvement of the study and research work infrastructure was achieved by moving to the House of Nature built in newly developed UL Academic Centre in Torņakalns, neighbourhood of Riga, in August of 2015. It is the most modern university building in the Baltics with auditoriums and seminar rooms, teaching and research laboratories equipped with the technological equipment meeting modern requirements. By building a new study and research centre in Torņakalns, the opportunities have occurred to provide the employees with better working conditions and an experimental study base. The total indoor area of the House of Nature is 18,540 m^2; it has a total of 30 auditoriums, 45 students teaching laboratories and 69 research laboratory rooms. Both Windows and Linux operating systems are available in the computer classrooms. Microsoft Office applications, statistical programmes (R, SPSS, PC-Ord), specific programmes for geoinformatics (ESRI ArcGIS, QGIS, PostgreSQL/postGIS, Bentley MicroStation, etc.) are available.

All auditoriums are equipped with a projector and a laptop computer to be used for presentations, also white boards. Interactive whiteboards are available in a part of auditoriums and laboratories. The UL House of Nature is fully equipped with wireless network coverage. The building has own cafe, a Natural Sciences Library and individual work booths. The building is accessible to people with mobility impairments – the building has several elevators and appropriately equipped sanitary facilities. The first two floors of the House of Nature are accessible to students 24 hours a day.

During the reporting period, the study and research equipment has been supplemented, and the material and technical base of several laboratories has been improved (Map Library, Remote Sensing and Cartography Laboratory, Soils, Environmental Chemistry, Environmental Monitoring, Environmental Technologies Laboratories, Forest and Water Resources National Centre, Chromatography Laboratory) to ensure the studies, as well as participation in the implementation of scientific grants, cooperation projects and the EU structural funds projects. For the elaboration of students' laboratory works, bachelor's, master's, doctoral theses, sample preparation equipment is used, for example, the extraction with CO_2 in supercritical condition, Soxhlet extractor (*Behr Labor-Technik*), microwave equipment (Milestone), spray dryer (LabPlant), ultrasonic equipment (Vibra Cell), lyophilizer (Labconco), vacuum oven, rotary evaporator (Heidolph), gas-liquid chromatographs with mass spectrometric detection GCMS-QP2010 Ultra (Shimadzu), GC-MS Clarus 680/SQ8C (Perkin Elmer), LC-MS/MS spectrometer with Acquity UPLC system, equipment for preparative chromatography (Biotage, Shimadzu), UV-VIS spectrometer (*Hach-Lange*, Shimadzu), fluorescence spectrometer (Horiba, Aqualog), atomic absorption spectrometer, inductively coupled plasma analyzer with optical emission detection and others. Automated phosphorus analyzer, Kjeldahl nitrogen determination device, CN analyzer and other equipment are used in water and soil research.

The availability of cartographic and spatial materials of Latvia continuously (24 hours a day, also remotely) is provided by the faculty's formed, maintained and continuously updated Map Browser. All study laboratories are freely accessible to students and teaching staff, while access to research laboratories is possible after coordination with the responsible staff. Practically all the material and technical support necessary for the implementation of study programmes in all fields is at the disposal of the UL. The UL FGES continuously improves the range of available equipment; the UL FGES also has several unmanned aerial vehicles (drones) at its disposal, including DJI Matrix600 with multispectral camera and changeable cameras, multiple real-time GPS receivers, surveying equipment for measurements, rock processing and analysis equipment, etc. For the realization of individual research for bachelor's and master's theses, the material and technical support at other UL structural units also can be used, for example, the electron microscopes at the disposal of the UL Institute of Chemical Physics and other units of the UL, analytical equipment at the Institute of Food Safety, Animal Health and Environment "BIOR", the infrastructure of Latvian State Forests Research Institute "Silava". For the needs of the academic bachelor's study programme "Cultural and environmental heritage", in material and technical terms, the implementation of the Art Academy of Latvia related programme is supported by the access to the AAL Library resources. The course part related to cultural heritage of the programme is provided by the methodological tools and experience gained by the AAL lecturers in investigating cultural objects.

Therefore, it can be concluded that all the study programmes included in the study field have the access to all the necessary material and technical support to carry out qualitatively implemented study process. Within the UL and the UL FGES, a unified, successfully functioning system and well-known procedures have been established serving for material and technical, methodological, informational, etc., purchasing of collateral and improvement.

2.3.3. Provide information on the system and procedures for the improvement and purchase of the methodological and informative provision. Description and assessment of the availability of the library and the databases to the students (including in digital environment) and their compliance with the needs of the study field by specifying whether the opening times of the library are appropriate for the students, as well as the number/ area of the premises, their suitability for individual studies and research work, the

services provided by the library, the available literature for the implementation of the study field, the databases available for the students in the respective field, the statistical data on their use, the procedures for the replenishment of the library stock, as well as the procedures and possibilities for the subscription to the databases.

The UL Library general description

The UL Library is included in the Library Register of the Ministry of Culture (BLB1000) and accredited until 2027 in the status of national library (accreditation certificate No 22C of the Ministry of Culture).

Access to Library information resources and services, opening hours

The basic principle of the library's work is the accessibility of its services to all users.

The eight sectoral libraries offer all the services facilitating independent studies in accordance with *the UL Library Terms of Use* (the UL Rector's Order No 1-4/9 of 7 January 2021).

The opening hours of sectoral libraries are conveniently adapted to user's needs. The libraries are open from 9am to 8pm on weekdays – with some of them open from 9am to 6pm – and from 9am to 5pm on Saturdays.

The Natural Sciences Library and the Library of the House of Science are open 7 days a week, 24 hours a day. Three of the sectoral libraries are open for visitors throughout the year, including summer. The premises of the Natural Sciences Library, where the fields collection in Environmental Science and Environmental Protection is placed, and as it was already mentioned, are open to students at convenient times, 24 hours a day, 7 days a week. An open-access repository (free-access collection) is available to the users. The Natural Sciences Library is located in the UL Academic Centre, the House of Nature (Jelgavas Street 1), with the total area of 662.80 m^2. The Natural Sciences Library provides about 150 working places for visitors, including 20 places equipped for using computers.

Free basic services and paid services

The UL Library provides free basic services and paid services in accordance with *the Library of the UL Paid Services and Price List* (the UL Rector's Order No 1-4/387 of 10.08.2021).

More information on the UL Library website https://www.biblioteka.lu.lv/en/ – section *Services*.

User training

The Library of the UL actively works with its target audiences – students at all programme levels, academic, research and general staff – to promote information literacy and to provide in-depth knowledge and skills at working with electronic resources. More information on the UL Library website https://www.biblioteka.lu.lv/en/ – section *Studies*.

Library collection, collection replenishment procedure

The UL Library compiles the collection in accordance with the fields of studies and academic work of the UL and the requirements of its study programmes for all levels of the UL studies – bachelor's, master's, doctoral, as well as for scientific research. The priority in replenishing the collection is the purchase of e-resources.

New acquisitions for the collection (acquisition of books, subscriptions for databases and periodicals) are conducted in accordance with the UL centralised funding, which is approved

annually by a UL order.

The Library ensures the purchase of information resources according to the orders of the UL academic staff, the proposal of the students' self-government or the suggestions of the Library staff, which are entered into the LUIS (the UL information system) and being approved by the dean of the faculty or the executive director.

In 2022, the Library makes available 1.8 mln information resources to its readers. In accordance with the UL study and research infrastructure, the UL Library collection is assembled in 8 sectoral libraries and Repository.

Literature available in the Library for implementation of the studies

Information resources for the study field "Environmental protection" in terms of the natural environment and cultural environment are available in several structural units of the UL Library – in the Natural Sciences Library in the House of Nature of the UL Academic Centre (mainly the latest literature in environmental science), in the Humanities Library, the Library of the Faculty of Social Sciences, in the UL Library at Kalpaka Boulevard (the literature related to the topics of cultural heritage) and in the UL Library's Repository (extra copies, editions of earlier years, universal collection in all fields). Taking into account that this subject matter may be included fragmentarily in publications with a wider content, the practical number of useful literature in the UL Library's Repository is even greater, while the information contained in part of publications overlaps in several course programmes.

Provision of educational literature for the SF EP is summarized in **Table 2.3.3.1**.

Table 2.3.3.1.

Provision of educational literature for the study field

In total, for the study field "Environmental protection" (in total, in the UL Library's collection on 01.01.2023.)						
Printed editions (title / number of copies)			Distribution of editions by language (title / number of copies)			
Books	Series editions, periodicals	Other types of editions	Latvian	English	Russian	Other languages
12,374 / 24,526	**761 / 11,321**	**533 / 1,105**	**3,663 /13,884**	**3,066 /9,968**	**5,013 / 8,873**	**1,926 / 4,227**
Total: 13,668 titles = 36,952 copies						

By selecting the data on the provision of relevant information resources for this study field, guided by course keywords of the study programmes and related classification indexes, by 01.01.2023., in the UL Library, a total of 36,952 copies of printed editions of 13,668 titles are available, of which 7,366 copies of printed editions of 2,855 titles are located in the House of Nature.

In total, for the study field “Environmental protection”
(in total, in the collection at the House of Nature on 01.01.2023.)

Printed editions (title / number of copies)			Distribution of editions by language (title / number of copies)		
Books	Series editions, periodicals	Other types of editions	Latvian	English	Other languages
2,637 / 5,952	**63 / 1,038**	**155 / 376**	**928 / 3,974**	**1,235 / 2,481**	**692 / 911**

Total: 2,855 titles = 7,366 copies

Information resources published after 2000, for the study field “Environmental protection”
(In the UL Library’s collection on 01.01.2023.)

Printed editions (title / number of copies)			Distribution of editions by language (title / number of copies)		
Books	Series editions, periodicals	Other types of editions	Latvian	English	Other languages
2,433 / 7,802	**147 / 2,005**	**270 / 795**	**1,377 / 6,550**	**1,261 / 3,646**	**212 / 406**

Total: 2,850 titles = 10,602 copies

Information resources published after 2000, for the study field “Environmental protection”
(In the collection at the House of Nature on 01.01.2023.)

Printed editions (title / number of copies)			Distribution of editions by language (title / number of copies)		
Books	Series editions, periodicals	Other types of editions	Latvian	English	Other languages

1,159 / 3,263	**28 / 97**	**142 / 380**	**466 / 1,958**	**799 / 1,695**	**64 / 87**

Total: 1,329 titles = 3,740 copies

Printed information resources offered by the UL Library meet the requirements for the study and research process in the study field “Environmental protection”.

As the latest and most sought-after literature is offered in the House of Nature, the emphasis on the language of the publication has changed – the majority of editions are in English. The share of editions in Russian has decreased significantly, it is also minimal in German. Unlike previous years, original editions are used for studies, rather than translations. The relatively largest number of materials in Russian can be observed only in the range of earlier years on the subject related to climate change stored in the UL Library’s Repository (more than half), while German prevails in the German-Baltic studies of the earlier centuries, stored in UL Library’s Repository, which can now be used in relation to the cultural and environmental heritage. In general, the UL Library has gathered a wide range of publications, including historically important ones, which directly or indirectly are related to the studies of the natural environment and cultural and environmental heritage for their potential protection.

In recent years, the range of publications for environmental protection studies has noticeably expanded not only with books and periodicals, but also with other types of publications – maps, a significant number of doctoral theses on relevant topics, audio-visual materials, videos, etc. The number of publications in electronic form is increasing. The offer of printed periodicals is decreasing, with a shift to digital versions instead. When purchasing new resources, the UL library gives the priority to e-resources.

The level of digitalisation of the collection

In cooperation with the UL Department of Information Technologies, the UL Library ensures the free online access to the e-resources repository of UL https://dspace.lu.lv/dspace/. For the convenience of users, a mobile version of the repository is also offered. The Library offers digitalised publications, which are subject of prohibition of copyright for use online, on-site in the reading rooms of sectoral libraries.

At the moment e-resources repository contains a total of around 45,000 publications that can be used in the direction of the SF EP (natural and cultural environment) studies.

E-resources

Following to *the UL Strategic Plan*, the UL Library is increasing the share of e-resources and developing remote access to e-resources.

By modernising the availability of electronic resources, the latest technology web service *Primo Discovery* and SFX has been introduced in the UL Library.

In 2022, the UL provides access to 42 e-resource platforms (e-books platforms, e-journals databases and individual subscribed e-journals, reference resources and tools, mixed-format databases). In total there are 17,477 full-text e-journals (including the individual subscribed e-journal titles), 205,306 e-books, almost 5 million full texts and abstracts of doctoral and master's theses from around the world available through subscriptions. The UL also provides links to 174 credible open-access databases with multi-format materials.

Each year the Library offers, on average, 110 new e-resource titles. Overall, on 01.01.2023. the UL Library provides access to 1676 purchased single e-book titles with 225,916 e-books available on *ProQuest Ebook Central Academic Complete Collection*.

Information about the e-resources is available on the UL Library webpage https://www.biblioteka.lu.lv/en/ sections *E-resources* from *A to Z* and *E-resources by discipline*, as well as on *Mans portāls* section *Datubāzes*.

The UL provides remote access to the subscribed e-resources (databases, e-book platforms) outside the UL network by logging in with a ULIS username and password.

By 01.01.2023., the UL Library collection holds the subscription for the e-journal "Nature", which most fully corresponds to the UL study field "Environmental protection", as well as several multidisciplinary e-resources, which also include materials for the study programmes "Environmental science" and "Research and protection of Cultural and Environmental Heritage" involved in the UL study field "Environmental protection".

Subscribed multidisciplinary e-resources for the study field "Environmental protection"

Cambridge Journals Online – a full-text database of multidisciplinary e-journals from Cambridge University Press offering the opportunity to search information in more than 300 scientific journals, as well as related Internet resources. The database contains full texts in such fields as culture, art, philology, philosophy, computer science, finance, politics, law, history, ecology, geology and many others.

EBSCO *Central & Eastern European Academic Source* – the database offers full texts of more than 400 journals in fields such as economics, politics, medicine, law, information and library science, literature, linguistics, history and sociology, covering the region of Central and Eastern European countries.

JSTOR – database of journals, books and primary sources. On JSTOR, journals from leading publishers are available: *Sage Publications*, *Springer*, *Taylor & Francis*, *Blackwell Publishing*, *Cambridge University Press*, *Oxford University Press*, *John Wiley & Sons*, etc. The chronological coverage of journals goes back to the beginning of their publicity. The core collection ***Arts & Sciences I-XII, XIV-XV*** offers information resources in the humanities, social and exact sciences, covering the fields of anthropology, economics, political science, history, languages and literature, art, education, etc. The core collection ***Life Sciences*** offers information resources in the fields of biology, biodiversity conservation, botany, palaeontology, zoology and ecology.

LETA – News, archive and Nozare.lv – offers the opportunity to search for operationally published news, photos, videos, press releases, articles from press publications in Latvia, statistics and other information.

Nature – an international journal that publishes quality peer-reviewed current research content in various field of science every week. The beginnings of its publicity can be traced back to London in 1869. It is currently published by *Springer Nature*.

OECD iLibrary – full-text database that compiles books, articles, reports and statistics in the fields of environmental sciences, local and regional development, development policy and other fields published by the Organization for Economic Cooperation and Development (OECD), as well as the International Energy Agency (IEA), the Nuclear Energy Agency (NEA), OECD Development Centre, the International Transport Forum (ITF) and the Programme for International Student Assessment (PISA).

Oxford Journals – the collection provides access to more than **280** authoritative and leading

journals published in cooperation with the world's most important scientific organizations. The database includes full-text journals with high citation index scores in various fields of science – exact sciences, social sciences and humanities.

ProQuest Dissertations & Theses Global – the largest database of dissertations and master's theses in the world and contains more than 2.3 million papers in various fields.

SAGE Journals Online – full-text journal database of SAGE Publishing, offering articles from over 500 journals. Various exact, humanitarian and social sciences are represented in the database.

SAGE Research Methods – a research methods library of over 1,000 books, reference publications, journal articles and other resources. SAGE *Research Methods* is an important online tool for researchers. Two of them are available at the UL – SAGE *Research Methods – Books and Reference* and SAGE *Research Methods Cases*.

ScienceDirect – the database of *Elsevier* publishing house in natural and technical sciences, life sciences and medicine, as well as humanities and social sciences. The database contains information on several thousand journals and books published by *Elsevier*. Full texts of about 2,650 journals are available at the UL, mostly available from 2002 to the latest issue of the journal, as well as more than 350 e-books.

Scopus – bibliographic and citation information database of multidisciplinary scientific publications of the *Elsevier* publishing house.

SpringerLink – the full-text journal database of *Springer Nature*. For the UL scientific, academic staff and students it offers access to more than 6 million articles from more than 3,400 journals, covering the fields of exact sciences, humanities and social sciences.

Taylor & Francis Social Science & Humanities Library – provides access to full texts from more than 1100 scientific journals. The broad thematic coverage includes the fields: behavioural sciences, occupational safety, business, education, media, politics, regional studies, health and social care, sociology, anthropology, arts, humanities, etc.

Web of Science – the database containing the most relevant scientific information on more than 12,000 journals in the natural sciences, social sciences, humanities and arts, offering bibliographic and citation information for articles, abstracts and other information. The database consists of several citation index databases offering extensive possibilities for searching, selecting and analyzing results.

E-books purchased by the UL Library in the study field "Environmental protection"

VLeBOOKS – e-book platform, where 358 e-books purchased by the UL Library are available, which include materials for the UL study field "Environmental protection" from the world's leading publishing houses (for example, *Routledge*, *CRC Press*, *Cambridge Scholars Publishing*, etc.).

ProQuest Ebook Central Academic Complete Collection – subscribed collec6tion available on the e-book platform ProQuest eBook Central, which includes 55,139 subscribed editions (published in the period 2015-2022), as well as 32 e-books purchased separately in 2022, corresponding to the UL study field "Environmental protection" from the world's leading publishing houses (e.g., *Routledge*, *John Wiley & Sons*, *Stanford University Press*, *Cambridge University Press*, *Taylor & Francis Group*, *BRILL*, *Yale University Press*, *MIT Press*, etc.).

Some of the e-books purchased in 2022 corresponding to the UL study field "Environmental protection":

The Development of Eco-Phenomenology As an Interpretative Paradigm of the Living World:

Applications in Pandemic Times, edited by Daniela Verducci, and Maija Kūle, Springer International Publishing AG, 2022. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/lulv/detail.action?docID=7102361.

Anaerobic Digestate Management, edited by Vinay Kumar Tyagi, et al., IWA Publishing, 2022. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/lulv/detail.action?docID=7048939.

Hunter, Malcolm L., Jr., et al. *Saving the Earth As a Career: Advice on Becoming a Conservation Professional*, John Wiley & Sons, Incorporated, 2022. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/lulv/detail.action?docID=4385984.

Reiter, Yitzhak. *Contesting Symbolic Landscape in Jerusalem: Jewish/Islamic Conflict over the Museum of Tolerance at Mamilla Cemetery*, Liverpool University Press, 2022. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/lulv/detail.action?docID=1681781.

In total, on the beginning of 2023, the UL Library offers **4,617** e-books that meet the needs of the study field "Environmental protection".

Open resources which includes materials for the UL study field "Environmental protection"

*Ad*Access*, *Artstor Digital Library Public Collections*, *BioOne Complete*, *BioRxiv*, *Bookyards*, *ChemSpider*, *Cogent OA*, *Directory of Open Access Books*, *Directory of Open Access Journals (DOAJ)*, *Environmental and Experimental Biology*, *Europeana*, *Eurostat Data*, *F1000 Research*, *Google Scholar*, *GreenFILE*, *Hathitrust Digital Library*, *Herbert Publications*, *IGI Global Open Access Journals*, *Journals for Free*, *LearnChemistry*, *Open Humanities Press*, *Periodika.lv*, *PubChem*, *Raduraksti*, *Runivers*, *Semantic Scholar*, *SpringerOpen*, *Stanford Encyclopedia of Philosophy*, *The Encyclopedia of Earth*, *The Internet Encyclopedia of Philosophy*, *World Digital Library*, *World History Encyclopedia*, *WorldWideScience*, *Zenodo*.

Statistics of using databases within the study field "Environmental protection"

The statistical analysis of using databases is provided in the Annex – statistics of using databases subscribed to the UL for 2022.

Conclusions:

The printed information resources available in the collection of the UL Library, in terms of their content and number, as well as the electronic resources available in the subscribed databases by the UL and freely accessible online, generally correspond to the provision of the study process and the development of scientific research in the UL study field "Environmental protection". Every year, the collection is supplemented with the most current information resources in accordance with the informational needs of academic staff and students.

2.3.4. Provide a description and assessment of information and communication technology solutions used in the study process (e.g., MOODLE). If the study programmes within the study field are implemented in distance learning, the tools specially adapted for this form of study must also be indicated.

Nowadays, information and communication technology (hereinafter – ICT) solutions provides excellent opportunities for the development of the educational process. It allows to implement new projects and introduce new systems so that the study process would be as successful as possible.

The use of ICT in the educational process is one of the ways how to increase learning motivation.

The Department of Information Technology of the UL provides the UL students and employees with an application package *Microsoft* (henceforth – MS) *Office 365*, a cloud technological solution. *Office 365* provides students and employees with the best tools for modern study work, for example, *Outlook*, *Forms*, *OneNote*, *Sway*, and a package of *Office* programmes containing *Word*, *Excel*, and *PowerPoint*.

In addition to *MS Office 365*, students and employees of the UL are provided with software such as SPSS, *Question Pro*, *Autodesk*, *MathWorks MatLAB*, *Esri ArcGis,* etc. Access from outside the UL premises for the use of this software requires a VPN connection with the UL in order for the software to access network license services.

One of the *Office 365* online applications, *MS Teams*, is used to provide remote learning and distance learning programmes. This online application ensures both online lectures and recording of lectures, as well as online communication with students.

In addition to *MS Teams* programme for the online study process, the UL offers its students and employees a web video conferencing system *BigBlueButton* (hereinafter – BBB system), which is an open-source web online videoconferencing system. BBB ensures the organisation of the University's online events for the UL personnel, including students and event attendees. It can also be used as an integrated solution for e-study system (for only registered users in the course) and outside an e-study system, in which case one must connect to the UL online conference server in a web browser https://bbb.lu.lv.

Two e-study environments are available in the UL – estudijas.lu.lv and edu.lu.lv. The e-study environment estudijas.lu.lv is to ensure the study process and management, while the e-education platform edu.lu.lv is developed for e-education projects, events, and courses as well as distance learning programmes.

The open-source e-study environment *Moodle*, a modular object-oriented dynamic learning environment, is used for both e-study environments. Now, it is not only methodically and pedagogically but also economically most effective e-study solution. Courses have been developed in the *Moodle* e-study environment, where the necessary study materials and activities for students are available. There the teaching staff can assess students and register study attendance.

For data storage in the study process, the UL provides *Office 365* cloud service *OneDrive* 1TB, which is available for students and employees. *OneDrive* is *Microsoft's* cloud service that connects with all user files. It allows to save and protect files, share them with other users and access them from any location on all devices.

For data transfer, the UL offers its students and employees a large-scale file transfer system – https://store.lu.lv/. This system allows to send files that cannot be sent over an e-mail due to the size, however it is not intended for a long-term file storage.

Both in the library and in the teaching and scientific laboratories, sufficient number of computers are provided equipped with appropriate software; permanent and Wi-Fi Internet connection is available, as well as the possibility to use the facilities for teleconferences. The staff of the Department of Environmental Science (except for the youngest colleagues) has a long experience of teaching university courses, while at the same time being open to modern knowledge of student-centred education. Employees have the necessary experience of using the e-studies environment (Moodle) to successfully create an e-study environment for each study course. For most of the study courses learning materials created by university teachers are placed in the e-environment such as:

- original courses summaries,
- task sets,
- descriptions of laboratory works.

In the e-studies environment, it is possible to test students' knowledge both in the form of tests and by submitted written materials (solutions to tasks, laboratory work reports, etc.). The exchange of the experience between generations is ensured by the process of peer observation on classes. For the creation of the materials for e-studies, the "UL Moodle course creator's guide 2019" is available, as well as:

- questions and consultations on e-studies,
- tutorials, internet resources,
- video tutorials for university teachers,
- terms of use of the Information System.

Seminars for the analysis of new teaching methods are held at the UL, promoting their acquisition and implementation in the study process. In addition to the already existing materials, new study materials are gradually being developed, approved and placed into the Moodle environment. The improvement of the teaching staff's methodological skills is additionally facilitated by the centrally organized professional development activities of the UL.

2.3.5. Provide information on the procedures for attracting and/or employing the teaching staff (including the call for vacancies, employment, election procedure, etc.), and the assessment of their transparency.

Normative acts that regulate the process of teaching staff recruitment and/or employment:

- *Regulatory Enactments on Academic and Administrative Positions at the University of Latvia* (available only in Latvian)
- *Regulations of the UL Professors Council* (available in section *Other annexes*, available only in Latvian)
- *Procedures for the Recruitment of Unelected Teaching and Research Staff at the University of Latvia* (available in section *Other annexes, available only in Latvian*)

There are three teaching staff groups at the UL: academic staff, who hold their academic positions based on elections; acting academic staff and visiting academics; as well as hourly-paid staff.

In the case of elected academic positions, as well as the acting academic staff, *the Regulatory Enactments on Academic and Administrative Positions at the University of Latvia* regulate the recruitment and selection. According to the regulations, the following academic positions exist at the UL: professor, associate professor, assistant professor, senior researcher, lecturer, researcher, assistant, research assistant.

Decisions on the need for certain positions are made by the faculties. Competitions for elected academic positions are announced openly. Public calls for applications for the elected academic positions, including the function and terms of reference for the respective position, are published on the UL website https://www.lu.lv/par-mums/vakances/ (available only in Latvian), internationally advertised vacancies: https://www.lu.lv/en/about-us/vacancies/, and also in National Scientific Activity Information System and State Employment Agency of the Republic of Latvia vacancy portal.

Any person who conforms to the requirements specified by *the Law on Higher Education Institutions* may apply for the position.

The applicants for academic positions must deliver an open lecture, which is evaluated by two reviewers, who issue their opinion on the quality of the lecture. The election procedure is carried out either by the decision-making body of the relevant unit (in the case of assistants, research assistants, researchers, senior researchers, lecturers, and assistant professors – by the respective Faculty Council), however in the case of associate professors and professors – by the relevant Professors Council. Elections must take place within two months from the date of the call for applications. The personalia – docents, lecturers, assistants, senior researchers, researchers, and research assistants – are voted on by secret ballot. Professors and associate professors are voted openly (in accordance with the 05.11.2020 amendments of 2nd Paragraph of Section 33 (in force from 01.01.2021) of *the Law on Higher Education Institutions*). An applicant who has received more than half of the votes of the members present with the right to vote shall be considered elected. According to *the Law on Higher Education Institutions*, lecturers are elected for a term of 6 years. At the end of the term, the faculty decides on the need to announce a new competition. There are no restrictions on the term of office.

In accordance with the UL regulations, minimum requirements are set for all applicants for academic positions, i.e., knowledge of the state language in accordance with regulatory enactments, knowledge of foreign languages to the extent necessary for the performance of academic duties and continuous improvement of their academic and scientific qualifications. Other requirements differ across academic positions, for instance, to qualify for the position of docent, the candidate must have a doctoral degree, while the requirements for associate professors are more demanding, i.e., they must have considerable academic and pedagogical experience, an extensive list of publications and experience in scientific research projects.

If the Senate chooses to decline the proposal from the department and not to announce vacancies, a guest lecturer may be recruited; however, if a member of hourly-paid staff is more relevant to the development plans and needs of the faculty, the prospective employee concludes a contract for a specified period (usually for the duration of the study course). In such cases, the decisions relating to the candidates' recruitment and selection are taken by the structural units, i.e., faculties. In these cases, only the control to ensure that the remuneration set by the entity complies with internal and external rules and regulations is centralised.

The representative of the UL management concludes an employment contract with the person elected to the academic position for the entire period of election. The election of the teaching staff takes place in accordance with the procedure described above. For example, in order to ensure the renewal of the study program academic staff, I. Šteinberga (assoc. prof., 2016) was elected for the first time during the reporting period. Teaching staff who are elected as assistant professors for the first time: L. Kļaviņa (2020), I. Kukuļs (2022), J. Brizga (2022), J. Burlakovs (2022). In 2022, V. Obuka was elected as a lecturer.

The study programs under evaluation has a relatively large number of part-time lecturers who have a working relationship with the UL FGES for a certain term (for one semester or the entire academic year, depending on the taught study courses). Usually, as part-time lecturers become teaching staff having a desire for academic work or those who have another main work position. In the second case, they are specialists in their field, which is why they are recruited to teach study courses in order to provide students with more practical skills and professional competence.

By implementing the projects of the European Social Fund's (ESF) specific support goal No 8.2.2. "To Strengthen Academic Staff of Higher Education Institutions in the Areas of Strategic Specialization", during the period from 2018 to 2022, several visiting university lecturers (who had

passed the selection competition) were attracted to the study programmes of the Environmental protection, and it is planned that another one of visiting university lecturers could be elected to an academic position at the UL FGES.

The selection of employees for positions is ensured in accordance with the competences necessary for the achievement of strategic goals and according to predetermined criteria.

External funding is also used to attract strategically important personnel groups, for example, for the involvement of foreign lecturers or doctoral students in the work at the UL.

At the operational level, personnel planning in the academic institutions of the LU is implemented twice a year, based on the study plan and scientific needs, creating a plan for workloads in accordance with the UL 07.12.2016. Order No. 1/469 "REGULATIONS FOR PLANNING AND RECORDING OF WORK OF ACADEMIC STAFF".

Personnel in academic and elected positions are selected in an open competition and elected for a certain term in accordance with the Regulation on Administrative and Academic Positions (Approved by the Senate of the UL 31.01.2022. Decision No. 2-3/11). For professors and associate professors, the criteria defined in external regulatory acts are applied. For the rest of the elected academic staff, the criteria are set by the dean of the faculty and approved by the faculty council. The selection and choice of university lecturers is done by the study programme director in cooperation with the faculty dean, as well as taking into account the evaluation of students. In cooperation with employers' representatives, the best professionals in the relevant field are selected for each specific study course.

The number of academic staff is reviewed once a year on 1st October in connection with the start of the academic year and on 1st January in connection with budget planning.

For staff planning, a centralized staff list is used, which also shows vacancies, as well as workload maps of academic staff.

2.3.6. Specify whether there are common procedures for ensuring the qualification of the academic staff members and the work quality in place and provide the respective assessment thereof. Specify the options for all teaching staff members to improve their qualifications (including the information on the involvement of the teaching staff in different activities, the incentives for their involvement, etc.). Provide the respective examples and specify the way the added value of the possibilities used for the implementation of the study process and the improvement of the study quality is evaluated.

The UL Strategy 2021-2027 emphasises that the goal of the development and excellence-oriented personnel policy is to ensure the development, growth and renewal of academic and general personnel, to create a performance-based personnel management system, which will also include competitive and motivating personnel remuneration, to improve academic staff career development opportunities, to create a system for attracting local and foreign academic staff, as well as new talents, and to promote international mobility.

The added value of raising the qualifications of the academic staff is ensured through mutual cooperation, informing colleagues about the acquired skills and knowledge, but most importantly, contributing to the improvement of study content and methods. In recent years, information

sharing has been critically important for improving digital skills, developing critical thinking in information analysis.

Teaching staff of the SF EP ensure and improve their qualifications by performing the following actions:

1) implementing the improvement of professional qualifications in accordance with the Paragraph 16 of the Cabinet of Ministers Regulations No 569. (Riga, 11.09.2018, Prot. No 42 § 14) “Regulations on the Necessary Academic and Professional Qualifications of Pedagogues and Professional Competence Development Procedures " for point no. 16;

2) performing a self-assessment once a year;

3) conducting scientific and academic activities and participating in international conferences;

4) acquiring certified continuing education courses;

5) developing the skill of applying a student-centred learning approach in lectures and classes;

6) participating in the informal exchange of experience of science teachers;

7) participating in the faculty formed schools for secondary school pupils and the organization of regional and state Olympiads of Latvia, in reviewing, evaluating and organizing pupils’ scientific research works;

8) improving English language skills.

The professional development of the UL academic staff is organised in accordance with the Cabinet Regulations No 569 of 11.09.2018 *the Regulations on the Necessary Academic and Professional Qualifications of Pedagogues and Professional Competence Development Procedures*, where Paragraph 16 states: “Educators of higher education and colleges shall, by the end of the term of their election, undertake a vocational development programme on innovation in the higher education system, or the higher education didactics, or the management of educational work at 160 academic hours. (including at least 60 contact hours). Professional development may include international mobility and participation in conferences and seminars relevant to the purpose of the professional development, as evidenced by submitted documents", as well as the Cabinet Regulation No 129 of 25.02.2021 *the Procedures for Evaluating the Scientific and Teaching Qualifications or Results of Artistic Creation Work of an Applicant for the Position of Professor or Associate Professor and of a Professor or Associate Professor Holding the Position*.

The qualification requirements and tasks of the academic staff of the UL are included in *the Regulations on Academic and Administrative Positions at the University of Latvia* (the UL Senate Decision No 2-3/11 of 31.01.2022), while the quality/performance of the academic staff of the UL is evaluated in accordance with *the University of Latvia Academic Remuneration Regulations* (the Senate Decision No 14 of 30.05.2016) and *the University of Latvia Scientific Personnel Remuneration Regulations* (the UL Senate Decision No of 27.01.2020).

The Academic Department of the UL, the Adult Pedagogical Education Centre (hereinafter – APEC) of the Faculty of Education Sciences and Psychology of the UL (hereinafter – the UL FESP) provide informative, consultative, and methodological support to the UL academic staff in the field of the higher education didactics. The APEC of the UL FESP offers a vocational development programme “Didactics of Higher Education: modern theories and practices”, as well as continuing education programmes “Pedagogical aspects of the development of study programmes in higher education”, “The professional development of the competence of the student trustee”, etc. However, within the framework of the *Study Development and Management Improvement Programs* (SDMIP) projects, the university lecturers and primarily the programmes directors were actively involved (in total,

~48% of the staff have attended qualification improvement courses).

On the completion of the continuing education programme “Methodology for the formulation and evaluation of the learning outcomes”, programme directors and academic staff purposefully update their study courses and the mapping of the learning outcomes of the respective study programmes and study courses. The courses were attended by the director of the bachelor’s programme, assistant prof. I. Kukuļs, who supervised the refinement of the courses descriptions. The mapping of study courses has been reviewed and refined at preparing for the accreditation of the study programmes.

The UL academic staff can improve their English language skills by completing the continuing training programme “Professional English Language Enhancement Course for Academic Staff” at the Centre for Applied Linguistics of the UL Faculty of Humanities. This opportunity was used by 8 lecturers and 7 researchers. Newly elected lecturers and assistant professors (R. Ozola-Davidāne, V. Obuka) positively evaluate the knowledge gained during the courses. Young academics and doctoral students from various UL doctoral programmes, each spring semester, are actively using the possibility to attend the continuing education programme “Introduction to teaching in higher education”. To promote collegial learning and identify good practices in teaching, the continuing education programme “Promoting the colleague experience exchange of academic staff” where academic staff perform peer observation, thereby directly promoting the exchange of teaching experience among academic staff and contributing to the UL organisational development has been developed, within the framework of which the academic staff carries out collegial peer observations, thus, the exchange of pedagogical experience among the university lecturers and the development of the UL as an organization tended to learning is purposefully promoted. The UL academic staff collaborating with freshman students are a special target group for continuing training and as such are offered a continuing education programme “Professional development advising first-year students”. Academic staff in continuing education programmes especially welcome the opportunity for study process modelling, testing new teaching methods, exchange experience.

With the funding of the EU in the period from 2018 to 2023, several study programmes for lecturers are being implemented:

1. Development of online learning and digitalisation of learning content (target group – academic staff).
2. Innovations to improve the quality of the learning process (target group – academic staff).
3. Academic integrity (target group – heads of study fields and study programme directors).

All programmes have been developed by analysing the professional development needs of academic staff in the context of higher education trends. As a part of the implementation of the academic staff training system, the UL Academic Department conducted an electronic survey of the UL academic staff, which allowed to pool information on their ongoing professional development needs, as well as encouraged several faculty members to express their readiness to participate in the development and offering of continuing education content to their peers in line with professional and didactic development. needs.

After the implementation of each programme, a survey and an evaluation of the outcomes is conducted among the attendees of the programme. The UL faculties organise thematic seminars on topics of teaching training relevant to the academic staff of the respective faculty.

The professional development activities of the academic staff of the UL were included in the plan of measures for the development of the academic staff of the University of Latvia 2018–2023.

In order to determine the professional development needs of the academic staff of the UL in the

field of the pedagogical activity, the UL Department of Studies (now Academic Department) at the end of 2017 and the SDMIP of the UL in the 1st quarter of 2020 and in the spring of 2021 conducted a survey of academic staff, including heads of study fields and study programme directors, the results of which were taken into account when developing a training plan for the development of academic staff competence, including the project of the Operational Programme "Growth and Employment" 8.2.2. within the framework of the 1st round "Renewal and Competence Development of Academic Staff at the University of Latvia", 2nd round – "Motivated, Modern and Competitive Academic Staff of the Study Field "Education, Pedagogy and Sport" at the University of Latvia" and 3rd round "Strengthening the Capacity of the Doctoral Studies of the University of Latvia within the Framework of the New Doctoral Studies Model" (hereinafter – project “Growth and Employment”) in order to effectively plan and ensure the enhancement of the competence of academic staff.

The following outcomes are to be achieved by the December 2023:

- improved system of attracting and selecting the academic staff of the UL;
- reduced average age of teaching staff and the age structure approaches the EU average[1], with at least 1/3 of academic staff aged between 35 and 49;
- improved scientific performance;
- developed and implemented a model for the renewal and succession system of academic and scientific staff;
- developed and implemented a professional development system for the academic staff of the UL.

In accordance with the employment contract, the lecturers perform scientific activities, including publicity in peer-reviewed journals and international conferences. It is the responsibility of the lecturer to place the data on scientific and popular scientific publications and participation in conferences in the university information system (LUIS), and it allows the evaluation of the lecturer’s scientific activity. Scientific activity is often carried out in micro-collectives, working on the implementation of projects, while for teaching staff who are not involved in any project at the given moment their scientific work is supported from the faculty funds. The resulting indicators on the scientific activity of teaching staff can be found in the CVs and lists of publications attached to this report as Annexes.

University teachers regularly update their knowledge and skills in certified continuing education courses, including certified online courses. Depending on the field, a university teacher may choose the appropriate content courses. University teachers share their experience, advise each other and learn student-centred teaching methods for natural science students at university level in effective online courses.

In January 2020, several university teachers attended the UL Library training seminar “Management tools for references: a convenient solution for writing, citing and preparing the bibliography”.

With the funding of the EU, during the period from 2018 to 2022, several training programmes for university lecturers were implemented:

1. Online learning development and digitalisation of learning content (target group – academic staff);
2. Innovations for improving the quality of the learning process (target group – academic staff);
3. Academic integrity (target group – directors of study fields and study programmes).

Young university lecturers and doctoral students of various doctoral study programmes at the UL every spring semester more and more actively apply for the opportunity to acquire the continuing education programme “Introduction to the work of a university lecturer”. The reports on the completion of this course are placed in the UL information system by university lecturers.

Planning the growth and development of the academic staff, the UL pays equal attention to the identification of the most capable students in the study programmes of the UL and to motivating them to get involved in academic work already during their studies (related to both teaching and research). In this context, the UL has developed requirements and selection criteria for attracting new doctoral students in the framework of the project “Growth and Employment” (objective of specific support "To strengthen the academic staff of higher education institutions in the fields of strategic specialisation"):

1. A doctoral student studying in the last year of an accredited doctoral study programme, as well as a doctoral student who is a Latvian citizen studying in an accredited doctoral study programme outside Latvia, and a scientific degree candidate.
2. Successfully acquired number of credit points required in the first two/three years of study/ or, for a doctoral degree candidate, successfully completed studies in DSP.
3. Participation in an international scientific conference with a presentation/report.
4. Publication of at least one scientific article in an international publication.
5. English language skills at least at C1 level.
6. Successful passing of the doctoral examination in English.
7. Positive feedback from the supervisor of the doctoral thesis about the doctoral student as a potential lecturer.
8. Leadership traits and interest in UL research and course implementation.

Targeting the growth and development of foreign academic staff, the UL has developed requirements and selection criteria for attracting foreign academic staff:

1. Persons who have been employed in an academic position in one of the accredited foreign universities during the previous five years.
2. A doctoral degree in the relevant field of science or a doctoral degree equivalent to it.
3. Relevant scientific and academic work experience.
4. Ability to work in the e-study environment.
5. Participation in at least three international conferences with a presentation/report.
6. Published monographs and scientific articles, including in indexed international editions with calculated citations (at least three).
7. Participation in or participation in research projects.
8. Excellent knowledge of foreign languages, especially English, skills to use them in studies and methodological work.

As it was already mentioned, the UL academic staff collaborating with freshman students are a special target group for continuing training and as such are offered a continuing education programme “Professional development advising first-year students”.

When developing new study courses, the courses are created according to the requirements of modern science and production, in addition to the goals of the course content, the methodological targets determine a student-centred learning approach. To ensure this, university lecturers improve their qualification through self-studies, studying in methodology courses (see point 5) or learning the methods of the UL project “Entrance to future education (EFE)”.

In addition to the formal work of improving the quality of university teachers, academic staff improve their skills and get feedback from prospective students, simultaneously expanding the interest for studies opportunities in STEM fields. Namely, the work contract of the university lecturers stipulates and the academic staff are willing to be involved in the classes of “Environmental academy” organized for the secondary school pupils, in their conducting or in the development of materials. In addition, university teachers together with senior year students prepare the tasks, practical works and demonstrations for pupils’ regional and state Olympiads of

Latvia in environmental science. Thus, university teachers have the opportunity to overview and identify the preparedness of pupils and prospective students at the same time.

University teachers acquire and improve English within the ESF SAM No 8.2.2. project. The UL academic staff have the opportunity to improve the English language skills in the continuing education programme “Improvement of academic staff’s scientific and academic capacity in English” provided by the Centre for Applied Linguistics of the UL Faculty of Humanities.

For successful and unified implementation of study programmes at the UL, a special study programme for heads of study fields and study programme directors was developed, its implementation took place on 12.10.2021-28.10.2021, the training was run by an international accreditation expert from Poland and representatives of the Quality Agency for Higher Education of Latvia. The directors of study programmes in the SF EP have participated in the training, but the head of the SF EP is an expert at the Academic information centre and has participated in the accreditation of the study programmes in Lithuania, Estonia and Kazakhstan.

During elaboration of the study field self-assessment report, the information on the opportunities for promotion and qualification improvement used by the participating lecturers during the reporting period was collected, the results of which are summarised in Table 2.3.6.1.

Table 2.3.6.1.

Promoting the growth of teaching staff (assessment of didactic skills improvement and qualification improvement)

No	*Criteria / academic year*	2016/2017	2017/2018	2018/2019	2021/2020	2020/2021	2021/2022
1.	**Improving language skills**[2]				5	1	2
2.	**Higher education didactics (training)**[3]				-	-	5
3.	**Attendance at various summer schools**			1	0	2	4
4.	**Teaching lectures and study courses within the framework of Erasmus and Erasmus + programmes**	0	0	1	1	0	0
5.	**Participation in Erasmus or other staff development programmes**	1	1	1	2	1	3
6.	**Attendance at international scientific conferences (attendee)**	40	45	45	40	25	35

7.	**Attendance at national level scientific conferences (attendee)**	30	35	35	35	35	40
8.	**Participation in various seminars**	15	20	20	20	15	20
9.	**Membership in professional organizations**	21	21	21	21	21	21
10.	**Participation in various working groups (improvement of regulatory enactments, etc.)**	3	3	3	3	3	4
11.	**Participation in the organization and provision of continuing education**	1	1	1	1	1	1
12.	**Participation in various international scientific editorial boards**	7	6	7	6	6	8
13.	**Participation in various national scientific editorial boards**	4	4	4	6	8	12
14.	**Participation in various international organizing committees**	3	3	2	1	3	3
15.	**Participation in various national organizing committees**	7	5	5	4	4	4
16.	**Other continuing education courses, professional development courses, trainings, etc., not included in the university didactics**	1	1	2	2	15	12

During the reporting period, the staff of the SF EP was actively involved in the qualification improvement process, which applies to studies (English skills, university didactics, continuing

education, etc.). In total, 48% of the staff have undergone qualification upgrading. The results of the conducted research were actively presented at scientific conferences, although this activity decreased during the pandemic, but it has recovered after the pandemic ended. A recognized problem is the low activity of staff within the Erasmus+ programme, which is influenced by the mobility conditions of this programme, giving preference to shorter-term mobility. The staff of the SF EP actively participate in environmental protection activities at the national level – working groups, seminars where current issues in the field are discussed, ensuring the information exchange and communication with the social partners of the field.

[1] Eurydice Report "Modernisation of Higher Education in Europe: Academic Staff – 2017"

[2] For example, learning foreign languages in courses, trainings.

[3] Professional development courses, trainings, lectures in pedagogy, HEI didactics, work with students, etc.

2.3.7. Provide information on the number of the teaching staff members involved in the implementation of the relevant study programmes of the study field, as well as the analysis and assessment of the academic, administrative (if applicable) and research workload.

The basic information about the teaching staff involved in the implementation of the SF EP is attached in Annex 11, including *Curriculum Vitae* of teaching staff (in Europass format).

In 2022/2023, 76 members of teaching staff (elected academic staff) are involved in the implementation of the SF EP. For 2023/2024 academic year, it is planned that 87 members of teaching staff will be involved in the implementation of the SF EP, of which 71 are the elected academic staff selected by the UL. In **Table 2.3.7.1**, the number of teaching staff involved in the implementation of the SF EP by positions is indicated, as it was at the beginning of the reporting period (2013/2014 academic year), at the end of the reporting period (2021/2022 academic year), as well as the planned number of teaching staff in the new study programmes in the academic year 2023/2024. It should be taken into account that part of the teaching staff holds several of the positions indicated in the table, meaning, the university lecturers are also actively involved in the research.

From the number of university teachers indicated in **Table 2.3.7.1** who will lead the study courses in the academic year 2023/2024 (in total 20), 18 are doctors of science, and almost all of them are also working as researchers, leading researchers, associate professors or professors at other institutes, higher education institutions, including universities.

Table 2.3.7.1.

The number of teaching staff involved in the implementation of the study field

Position	Number by academic year			
Academic staff	**2013/2014**	**2021/2022**	**2022/2023**	**2023/2024**
Professor	**5**	**6**	**9**	**10**

Associated professors	**7**	**6**	**12**	**14**
Assistant professor	**14**	**15**	**18**	**20**
University lecturer	**4**	**3**	**4**	**-**
TOTAL	**30**	**34**	**39**	**44**
Leading researcher	**12**	**20**	**21**	**21**
Researcher	14	16	23	23
Scientific assistant	1	1	1	1
TOTAL	**27**	**37**	**45**	**45**
Other teaching staff				
University teacher	8	9	19	18
Visiting associated professor	-	1	1	1
Visiting assistant professor	-	-	1	1
TOTAL	**20**	**11**	**21**	**20**

In the academic year 2021/2022, in the implementation of the SF EP, 34 members of teaching staff with a doctor's degree, 9 with a master's degree were involved. For the academic year 2023/2024, it is planned that 46 doctors of science will participate in the implementation of the SF EP. In the academic year 2021/2022, from the teaching staff involved in the implementation of the SF EP, 75.5% are holding the position as the primary workplace and 24.5% as the secondary workplace.

The following elements of academic work are included in the workload of teaching staff:

- study work, which includes conducting of study courses, management and reviewing of final theses, consultations for students;
- methodical work, which includes updating study courses or developing new courses (including in the e-environment), participation in methodical seminars or conferences, etc.;
- scientific work, which includes participation in scientific conferences, projects, preparation of publications, etc.;
- professional development, which includes participation in professional development programmes, studying the latest scientific and methodical literature, etc.

The distribution of the mentioned components is various for different university lecturers, both depending on the level of studies and the activity of participation in the research and administrative work. However, all of the university lecturers carry out the research, the minimum volume of which is not less than 15% of the workload. In the case of approval of projects, especially related to the EU projects, the research load increases, usually reducing administrative work tasks.

2.3.8. Assessment of the support available for the students, including the support

provided during the study process, as well as career and psychological support by specifying the support to be provided to specific student groups (for instance, students from abroad, part-time students, distance-learning students, students with special needs, etc.).

The students of the UL have access to academic support, career development support and psychological support.

The aim of academic support is to provide students with information and advice on study issues for the entire period of studies. Academic support includes the implementation of the first year of studies support programme, advice on the study process (content of study programme, choice of study courses, legal documents regulating the UL study process), information on teaching staff consultations, consultations and workshops on learning study skills (notetaking, reading scientific literature, active listening, examination anxiety, time management, using library nd Internet resources).

Academic support in academic matters is managed centrally by the Department of Study Service and the responsible persons with the respective faculties: study programme director, tutor, mentor, programme assistant, study course lecturers, and the Students' Council of the UL and faculty self-governments. The Library of the UL provides consultations on the use of the library and Internet resources. Table 2.3.8.1 displays examples of key tasks to be performed by student support units/ staff.

Table 2.3.8.1

Examples of key tasks to be performed by student support units/staff

Structural unit/staff	Key responsibilities
Faculty student self-government	The student self-government of the UL FGES informs students about current events in the faculty (both, on the study process and events outside the study process); also organizes events outside the study process; helps to organize a system of the course responsibles in student groups; organizes inter-semester study courses' surveys; reports on the student problems to study programmes directors; organizes regular meetings with the faculty management (dean, heads of departments, head of study field) and controls the implementation of the decisions made.
Tutor	Informs students of the developments in the study process, provides individual support to those students who face difficulties entering academic environment of the UL and initiates adaptation and team-building measures.
Programme assistant, study advisor	Provides study advice, assists in day-to-day issues related to the study process, files study records, advises on the ULIS.

Mentor	A senior student who helps first-year students adapt to the study environment and share their experience.
Student Council (SC)	The purpose of the SC is to represent the UL students and to defend their rights and interests. The SC represents the students' interests in academic issues by electing student representatives to the decision-making bodies of the UL, considering issues related to the study process and its improvement.
Study programme director	Organises and manages the development of a study programme in accordance with the requirements of the specific scientific or economic sector, cooperates with employers and internship sites in matters of study content, evaluates and approves individual study modules and individual study plans, etc.
Department of Study Service	Organises the admissions process, advises the staff and students on mobility programmes, study, social and cultural issues, advises and organises career coaching and consultancy. Organises adaptation measures for students provides training for tutors, mentors, organises cooperation with employers, etc.

The aim of career development support is to provide students with comprehensive support and develop their lifelong skills to identify their interests, abilities, skills, experience, thus enabling them to make informed decisions regarding education and/or occupation, and ensuring that they can guide their future career, study, and life paths. Career development support is provided by the Career Centre of the UL Department of Study Service in collaboration with the respective faculties.

The Career Centre provides the following services to students:

- Individual consultations for future studies and careers, setting up an individual career plan, providing support for the transition between different levels of education and from education to the labour market;
- Workshops for career planning skills (“Career planning and development skills”, “My first job interview”, “Stress management”, etc.);
- Internet resource – Career Centre home page (information available in both Latvian and English) https://www.karjera.lu.lv/ and https://www.karjera.lu.lv/en/ provides up-to-date information on career planning issues, occupational information and the labour market;
- the “E-career” electronic resource https://e-karjera.lu.lv/, which enables students to quickly find their internship opportunities and jobs by adding their CVs to a database and employers to recruit employees by listing information on job vacancies in the database.

Psychological support is provided by the Department of Study Service. A psychologist-counsellor provides psychological support to students in solving personal and study issues arising from studies (relationship issues, conflict resolution, emotional difficulties). A psychologist provides individual counselling and telephone counselling.

Dedicated events aimed at international students are organised in cooperation with the Erasmus student network (ESN), thus introducing international students to Latvian culture and traditions and promoting interactions with domestic students.

The assessment of infrastructure accessibility for persons with disabilities has been conducted in cooperation with 'Apeirons'. The results obtained are considered both in the construction of the new infrastructure and in the provision of study programmes. In the buildings where studies take place, all premises are accessible to students with mobility impairments.

When starting the studies in one of the bachelor's study programmes of the UL FGES, first-year students are invited to participate in the first-year students gathering event "Pirmsarsistotelis" in the UL rural stationary "Lodes muiža" ("Lode Manor"). The event is organized by the students' self-government of the UL FGES; during it, through dexterity and erudition tasks, students get acquainted themselves, their study mates and 1st-year students of other study programmes. One of the goals of the event is the internal dynamics of the group and the establishment of contacts, thus, 1st-year students can become support persons in the initial stages of the study process.

Support activities for the 1st-year students are needed throughout the study year, but the first semester is considered to be particularly critical, as approximately one third of the 1st year students interrupt their studies. In order to reduce the number of students interrupting the studies, the 1st-year students of the academic bachelor's study programme "Environmental science" have access to various support systems. Direct students' support is provided through the course "Introduction to environmental science studies". Another type of support is a students' curator – a support person regularly meeting with students and being involved in solving students' current challenges. In addition, students have the opportunity to receive support from senior students through the mentor programme implemented by the UL.

Among the important events bringing students together are the boat trips "Ģeorallijs" ("Geo Rally") taking place once in the autumn semester and once in the spring semester. Within the traditions and important events, also "Ģeodienas" ("Geo Days") have to be mentioned, during which students have the opportunity to get acquainted with the teaching staff and other students in an informal atmosphere. Current problems are also discussed and solved at regular meetings of programmes directors, faculty management, course responsibles and representatives of the students' self-government. During these meetings, issues regarding more effective implementation of remote studies, as well as the adjustment and planning of students' workloads among the course lecturers, were addressed. An important support for students is financial support. A small number of students receive the UL scholarships; however, students have the opportunity to apply for additional scholarships of the UL foundation. According to the rules of the competition, the most suitable applicants may receive the Jānis and Elfrīda Rutki scholarships, the Alfreds Raisters memorial scholarships. Scholarships provided by some local municipalities of Latvia are also a significant support, for example, the students of the study programs of Environmental Science have received scholarships from the municipalities of Salaspils and Jelgava regions. Part of students take advantage of the opportunities to receive funding for their research, for example, "Scholarship of the Latvian State Forests" on the research on some of the topical issues in the forest industry.

2.4. Scientific Research and Artistic Creation

2.4.1. Description and assessment of the fields of scientific research and/or artistic creation in the study field, their compliance with the aims of the higher education institution/ college and the study field, and the development level of scientific research and artistic creation (provide a separate description of the role of the doctoral study programmes, if applicable).

The study field of research directions is determined by the priority directions of the Smart Specialization Strategy of Latvia, science and innovation, in which a high priority is addressed to the environmental protection issues. According to the UL Strategy 2021-2027, the UL mission is expressed in its motto “For Science and Fatherland”. The basis of the international reputation and competitiveness of the UL is grounded in scientific achievements and their integration into studies. The goal of the UL is to establish sustainable management and move towards a climate-neutral university, to develop an innovative and digital study, research and work environment. The UL develops environmentally friendly infrastructure according to the “green university” concept, including the reduction of the negative impact of the university on the environment, ensuring sustainable use of natural resources. The fundamental and applied research of the study field corresponds to the goals of the UL and the study field and the level of scientific development. It is evidenced by the implemented projects and publications of teaching staff and researchers involved in the study field, including publications indexed in *Web of Science* or *SCOPUS*.

The research in the fields of environmental protection is carried out in close cooperation with several research directions in the study field of Earth sciences and takes place in accordance with the priorities of strategic specialization:

1. Environmental quality and especially climate change, their driving factors, influence and management tools;
2. Environmental resources, their protection and sustainable management solutions: innovation for the development of bioeconomy and circular economy.

The main research areas in which the university lecturers of the study field are working:

- Assessment of the state of natural and environmental systems, mathematical modelling of development trends and scenarios, assessment of the proportion and significance of the effects of biogenic and anthropogenic factors in the evolution of various systems. Spatial and temporal visualization of modelling results, interpretation of processes in ecology, environmental science and other fields;
- Impact of climate, land use and land cover change on soil and its properties. Composition of soil organic matter and contribution to greenhouse gases (GHG) emissions. Approach of ecosystem services in ensuring the sustainability of land use;
- Driving forces in landscape transformation and their impact on landscape sustainability, assessment and planning;
- Sustainability of cultural and environmental heritage in the context of climate change: research and management solutions;
- Composition and biological diversity of surface waters in Latvia, water recultivation methods, wastewater treatment technologies;
- Regularities of peat bogs functioning, changes after the Ice Age, anthropogenic impact on biological diversity, solutions for restoring bogs;
- Impact of climate change on environmental resources and biological diversity. Aspects of adaptation to climate change, especially impacts on land use, ecosystem services: participation in the development of the climate policy of Latvia, solutions for moving towards climate neutrality;
- Solutions for circular economy and bioeconomy: use of waste as a resource, bio-refining and valorization of biomass processing by-products – innovation for the development of environmental technologies;
- Consumption patterns in society and innovation for sustainable development;
- Environmental education, climate education.

Scientific activity in environmental science is carried out at the UL Department of Environmental Science in cooperation with other units and departments of the UL FGES and other structural units of the UL, such as the UL Faculty of Biology, the UL Faculty of Chemistry, the UL Institute of Solid State Physics. In the fields of environmental science corresponding to the SF EP, the research is very broad at the scale of Latvia, thematically diverse and includes both fundamental and applied research. At the UL, several institutes are closely related to these fields (the UL Institute of Biology, the UL Institute of Geoinformatics). In the international evaluation of scientific institutions in 2019, the direction of environmental science, as part of the UL Natural Sciences cluster, received 3 of 5 points in the overall evaluation, and 4 of 5 points in the evaluation of the scientific quality. According to the evaluation methodology, it indicates a very good scientific quality and refers to institutions as strong international players. The capacity of the study field is also strengthened by cooperation with research institutes active in the environmental sector, especially the Institute of Food Safety, Animal Health and Environment “BIOR”, Hydroecology Institute of Latvia, Latvian State Forests Research Institute “Silava”, Latvian Institute of Organic Synthesis. Intensive cooperation in research is developing with the higher education institution of Latvia having research direction in environmental protection. First of all, cooperation with the Institute of Energy Systems and Environment of Riga Technical University, the Department of Environment and Water Management of the Latvia University of Life Sciences and Technologies among other institutions can be emphasized. The research in the fields of environmental protection is carried out both as current applied research in Latvia, ordered by individual companies, municipalities, state administrative institutions, and as fundamental research, both in cooperation with foreign research institutions and within the Latvian National Research Programmes of the Latvian Council of Science. The subject matter of the research is current, corresponds to the priority research directions and provides coverage of the sub-sectors necessary for the implementation of the study process.

A large number of fundamental and applied research have been carried out in the field of environmental protection (Annex *The number of implemented projects in the field*). Among the wide range of the research subject matters, some can be emphasized as marshland studies, aiming to understand the regularity of marshland formation, impact of natural and anthropogenic factors, but especially the impact of climate change on binding the organic compounds and the development of sustainable protection and management solutions.

The UL Unit of Environmental Science organizes the plenary session of the faculty and several sections within the annual UL international scientific conference. With the participation of the faculty, several international scientific conferences were organized in Latvia during the reporting period, including the 13th International Conference of Humic Substances Researchers. With the participation of the faculty, various research promotion events are organized, such as the annual event “The Night of Scientists’”.

2.4.2. The relation between scientific research and/or artistic creation and the study process, including the description and assessment of the use of the outcomes in the study process.

Scientific and applied research in the study field is closely connected with the study process (bachelor’s, master’s), supplementing and improving it. Teaching staff of the SF EP, apart of the study process, is involved in science and participate in the achievement of project results. Elective

courses included in the study programmes usually are related to the research areas of the teaching staff. The teaching staff incorporates their research experience, proven results and developed methods into study courses, thus ensuring continuous acquisition of the latest knowledge and skills for students. For example, prof. Māris Kļaviņš, working in the field of environmental chemistry, enriches the study courses "Environmental chemistry" (at bachelor's level) and "Ecotoxicology" (at master's level) with the results obtained in own research work, while assistant prof. Imants Kukuļs integrates the knowledge obtained from Horizon 2020 project results in the course "Soil science" by including developed in the research project methods in the course content.

By fulfilling the UL Strategy, the Department of Environmental Science provides science-based studies using modern and competitive educational technologies, as well as promoting the scientific activity of students and staff. Access to the databases of scientific publications allows to improve study courses by using the latest research findings. During study courses, the teaching staff introduces students to scientific articles corresponding to the content of the study courses (see the section related to periodicals in the descriptions of courses).

Already in bachelor's level study programmes, the courses are included, within the framework of which students are introduced to the selection and analysis of appropriate literature, the research methods used, as well as the processing, reflection and presentation of the research results. In particular study courses, it has been achieved by including the preparation of reports or the performance of individual research implementation in the students' independent work (see the descriptions of courses). The bachelor's degree study programme intends for a bachelor's thesis project, within which a student already chooses the research topic, in developing the thesis project, use both the knowledge and skills acquired during the study process, as well as the latest findings and methods, and the analysis of scientific articles. The bachelor's thesis project is presented and defended. In all study programmes, the research is an integral part of the final theses. Almost all students' final theses are developed under the supervision of scientists, which is feasible only due to the extensive research capacity. Besides, the majority of students are involved and also employed in the research projects during the development of their works, thus, essentially gaining their first work experience in the field already during the studies. Such closer interaction allows better development of students' research skills. University lecturers are also scientists conducting the research in previously mentioned scientific institutions. It ensures a more reasonable balance of scientific and academic work and improves the competence of the academic staff.

In the study process, other methods are also used, contributing the students' integration into the academic environment. Students are invited to participate in scientific seminars. Master's level students are encouraged to participate in the corresponding to the study field sections of the annual UL conference. The information on the involvement of students in the implementation of research projects, see Section 2.4.5. The implementation of the SF EP study programmes in the new UL House of Nature, where several research centers are also located, significantly expands the students' opportunities to be integrated into the UL's academic environment and research, significantly facilitates interdisciplinary research, as well as the use of equipment and laboratory devices necessary for the research. Applied studies (internship) within the framework of all academic bachelor's and master's level study programmes promote mobility related to the research, offering students the opportunity to get acquainted with research work in other collectives.

2.4.3. Description and assessment of the international cooperation in the field of scientific research and/or artistic creation by specifying any joint projects, researches, etc. Specify those study programmes, which benefit from this cooperation. Specify the future plans for

the development of international cooperation in the field of scientific research and/or artistic creation.

The research in the fields of environmental science and technologies is carried out both in the framework of international cooperation and in solving local applied issues by performing contract works for the national economy of Latvia. As a result, locally topical solutions are provided, as well as the research competitive and innovative on a global scale. However, the greatest part of most successful research occurs within the framework of international cooperation and all scientific research groups cooperate with foreign colleagues.

An additional feature of the study field is that part of the teaching staff carries out their research work in the faculty, as well as in collaboration with researchers in institutes of environmental field. **Table 2.4.3.1** indicates the funding placed at the disposal of the UL FGES. The budgets provided to the studies in environmental science are comparable to those of foreign-sourced research projects. It characterizes intensive and competitive international cooperation.

Table 2.4.3.1.

The budget for the study field "Environmental protection" and the total amount of international research projects

Year	The SF EP, EUR	International research, EUR
2017	339,000	249,800
2018	370,000	553,300
2019	412,000	219,100
2020	418,800	603,500
2021	493,800	379,700
2022	497,800	244,100

All study programmes in the study field benefit from international cooperation, as the scientific qualification of the teaching staff is ensured, orientation to world trends in the represented field is realized and current scientific topics are offered for the elaboration of students' final theses. For example, in collaboration with international partners, a project is being implemented aiming to improve the information on agricultural soil in Latvia and to obtain the information on carbon changes in the soil and country-specific GHG emission factors. The researchers of the Department of Environmental Science participate in a European joint research programme aiming to ensure sustainable soil management in agricultural lands, which would contribute to limiting climate change. The Department of Environmental Science is one of the cooperation partners that implements the development of soil classification, description, diagnostics and mapping methodologies and the updating of peat moss distribution maps in Latvia. **Table 2.4.3.2** summarizes international research projects implemented in the SF EP.

Table 2.4.3.2.

The list of international research projects in the study field "Environmental protection"

Title of the project	Source of funding	Implementation time
International cooperation network for harmonization of atmospheric aerosol measurements using ground-based photometers (Harmonia)	COST action CA21119	2022- 2026
Energy perspectives: proactive strategies and policies for energy citizenship transformation	Horizon Europe, Framework programme for research and innovation	2021- 2024
Enhancement of sustainable soil resource management in agriculture (E2SOILAGRI)	Norway Grants project	2021- 2024
Towards climate-smart sustainable management of agricultural soils	Horizon Europe, European Joint Programme for Soil Research	2020- 2025
MonGOS – Monitoring of water and wastewater management in the context of circular economy implementation	Polish National Agency for Academic Exchange	2020- 2022
Market driven authentic non-timber forest products from the Baltic Sea region – wild and semi-cultivated species with business potential (NovelBaltic)	Interreg Baltic Sea Region Programme	2019- 2022
Environmental impact assessment of hydropower plants using multimarkers	Latvia – Ukraine cooperation project	2019-2021
Harmonized studies' content in the circular economy and resource efficiency in the Baltic Sea region (Crea-RE)	Interreg Baltic Sea Region Programme	2018- 2020
Sustainable management of phosphorus in Baltic countries (InPhos)	EIT Raw Materials, the structure of the EU under the framework programme Horizon 2020	2018- 2020
Extraction of humic substances from peat and isolation of humic and fulvic acids as commercial products	Vapo Ltd (Finland) contract job	2018- 2019
Preparation of study materials on resource efficiency, circular economy	Seed Money project #S009 ERREC 2.0 preparation; Interreg Baltic Sea Region Programme	2018- 2018

Extraction of humic substances' samples as a prototype of commercial product	Vapo Ltd (Finland) contract job	2018- 2019
Chemical composition and source identification of fine aerosols (COLOSSAL)	COST Action CA16109	2017- 2021
MIRACLE – Mediating integrated actions for sustainable ecosystem services in a changing climate	ERA-LEARN, BONUS programme	2017- 2018
A systems approach framework for coastal research and management in the Baltic (BaltCoast)	BONUS programme 2010 – 2017	2017- 2018
Integrated doctoral programme for environmental policy, management and technology – INTENSE	EU Erasmus+ programme	2017- 2020
Water emissions and their reduction in village communities – villages in Baltic Sea region as pilots (VillageWaters)	Interreg Baltic Sea Region Programme	2016- 2019
Integrated planning tool to ensure viability of grasslands (LIFE Viva Grass)	EU LIFE+ programme	2014- 2019

2.4.4. Specify the way how the higher education institution/ college promotes the involvement of the teaching staff in scientific research and/or artistic creation. Provide the description and assessment of the activities carried out by the academic staff in the field of scientific research and/or artistic creation relevant to the study field by providing examples.

According to the information available in the *Scopus* and *Web of Science* databases, during the time period 2017–2022, a total of 254 scientific publications have been indexed for the teaching staff involved in the study field (the number of publications is indicated in Annex 14, the list of publications is summarized in Annex 16). The data reveal that the number of publications has increased by 30% during the reporting period, as the number of annually published articles indexed in the *Scopus* and *Web of Science* databases increased from 23 (in 2016) to 72 (in 2021). The teaching staff involved in the study field participate in the implementation of scientific projects both at the international and national level (see Annex 11 and the CV' of the teaching staff in the Annex). The list of presentations by teaching staff involved in the implementation of the programme at international conferences and congresses is impressive. When evaluating the participation of teaching staff with presentations in scientific conferences in 2020 and 2021, it should be taken into account that in the last two years, the organization of conferences was burdened due to measures to limit the spread of the COVID-19 infection (several conferences were cancelled or postponed).

The core of the staff of the Department of Environmental Science is formed of university lecturers

with higher workloads. In order to stimulate their international competitiveness, involvement in research is encouraged and supported through several mechanisms. Firstly, one of the conditions for the development of an academic career is the performance of scientific activity – publications, attracting projects, creating and managing a research group. Secondly, the planning of the study process is welcoming to changes associated with research visits, conferences and other events. Thirdly, additional resources and activities are available for the improvement and exchange of experience among the staff.

The university lecturers are also active participants in international scientific networks, as evidenced by the large number of conference theses and participation and organization of various events. The scientific qualification of the academic staff elected at the Department of Environmental Science significantly exceeds the requirements set in Latvia, for example, the Hirsh index for the absolute majority of all university lecturers is higher than the minimum requirement set for the corresponding work position category.

Among the teaching staff involved in the implementation of the study field, the majority are registered as experts of the Latvian Council of Science. The choice of fundamental and applied research directions is influenced by both the specialization of the teaching staff of the study field and the ability to attract the necessary funding for research, which is largely related to the relevance of the subject matter of the research and compliance with the priority directions of scientific development at both the national and international level. For example, assoc. prof. Iveta Šteinberga is working in the field of environmental modelling. Assoc. prof. Gunta Spriņģe is performing the research related to the impact of environmental changes on the development of freshwater hydrobiocenoses and the quality of hydroecosystems, the dynamics of the biological development of water bodies in the context of long-term studies hydroecosystems in Latvia, as well as the biological quality elements and their use in freshwater assessment in order to evaluate the biological diversity and sustainable development of hydroecosystems in Latvia.

Taking care of the development of the academic staff involved in the implementation of the study field (see section 2.3.6), a great attention is paid to the renewal and succession of the academic staff. A special role in the renewal process of the academic staff is played by the doctoral study programmes at the UL. For instance, three members of teaching staff working in the field of environmental protection have defended their doctoral theses at the UL during the reporting period, namely: “Sapropel for the development of biocomposite materials: properties and application possibilities” by Vaira Obuka, “Development and characterization of clay-based composites for innovative and environmentally friendly applications” by Rūta Ozola-Davidāne and “Character of sapropel properties based on its formation conditions and possibilities of its use” by Karina Stankeviča. The young scientists involved in the implementation of the study field use post-doctoral support measures. Four post-doctoral projects are implemented by the teaching staff of the study field, namely: “Formula of peat-free soil conditioner with controlled-release fertilizing effect applicable for soil remediation and quality improvement of agricultural production” by Zane Vincēviča-Gaile, “Characterisation of invasive species in Latvia and their application potential for the growth of the bioeconomy” by Oskars Purmalis, “Innovative technologies for stabilization of landfills – diminishing of environmental impact and resources potential in frames of circular economy” by Juris Burlakovs and “Innovative solutions for the use of low-type peat in environmentally friendly in technologies” by Jānis Krūmiņš.

At the university level, the professional development system of the UL academic staff and the support programme for scientific excellence have been developed and implemented, which provides a material support for a publication in the Q1 category according to the classification indicated by the databases *Scopus* or *Web of Science*. At the university level, material support has also been provided for the participation of the UL academic staff in international conferences, but it

cannot be considered sufficient. Participation of academic staff in international conferences and publication of research results at the international level is supported at the level of structural units of the faculty.

Taking into account the above described, it can be safely stated that the composition of teaching staff involved in the implementation of the study field ensures the acquisition of high-quality theoretical knowledge and research skills in the field of environmental science, providing students with the opportunity to be successfully engaged in solving various research issues.

Table 2.4.4.1.

The compilation of quantitative data on scientific and/or applied research activities during the reporting period in the study field "Environmental protection" (bachelor's and master's study programmes)

	Criterion / Year	2017	2018	2019	2020	2021	2022
1	International scientific publications indexed in the databases *Scopus* and/or *Web of Science*	29	43	47	40	72	46
2	International scientific publications not indexed in the databases *Scopus* and/or *Web of Science*	0	5	7	4	3	3
3	Scientific publications of national level	2	11	1	1	2	0
4	Popular-science publications	2	2	2	3	0	155
5	Participation at international conferences with a presentation	29	40	38	24	20	24
6	Participation at national conferences with a presentation	15	7	5	6	3	5
7	Involvement in international scientific projects	15	16	15	14	14	13
8	Involvement in scientific projects of national scale (including ESF and ERDF)	1	1	1	1	4	1
9	Patents	1	0	1	1	1	0

2.4.5. Specify how the involvement of the students in scientific research and/ or applied research and/or artistic creation activities is promoted. Provide the assessment and description of the involvement of the students of all-level study programmes in the relevant study field in scientific research and/ or applied research and/or artistic creation activities by giving examples of the opportunities offered to and used by the students.

The students of environmental science elaborate their final theses in the Departament of Environmental Science, in other scientific institutions under the supervision of scientists or solving practically significant issues in enterprises, as well as in state administration institutions. The greatest part of the students during their theses elaboration time also work in scientific institutions or state administration, often starting their employment already while the bachelor's programme and continuing their work while studying for a master's degree, and subsequently also within the doctoral studies. Most of the funding for students' involvement comes from the research projects (Fundamental and Applied Research Project funding of the Latvian Council of Science and State Research Programme, ERDF, etc.). Active and serious involvement is also confirmed by scientific publications in which students are co-authors or even the first authors.

Since 2019, all qualification papers are available in unified electronic General Catalogue (https://kopkatalogs.lv/ (available only in Latvian), the UL final theses). The subject matters of both bachelor's and master's theses are related to scientific research at the faculty and cooperating institutes. The connection with active scientists ensures the connectedness of the topics of the work with the development of projects in significant subject matters at global scale and in Latvia, furthermore, the works are supervised by recognized researchers. Many students elaborate their bachelor's and master's theses in connection with practical projects or tasks at their workplaces. At the bachelor's level, the best students are legally involved in projects as employees. Therefore, the following students were elected as research assistants: V. Amatniece, K. Auziņš, L. Kļaviņš, V. Ozols, K. Upska, A. Ziemelis.

Students of both the bachelor's and master's level are actively involved in the various sections of the annual UL conference.

2.4.6. Provide a brief description and assessment of the forms of innovation (for instance, product, process, marketing, and organisational innovation) generally used in the higher education institution, especially in study field subject to the assessment, by giving the respective examples and assessing their impact on the study process.

In the reporting period, the innovations applied in the implementation of SF EP can be classified as organizational innovations, marketing innovations, infrastructure innovations, learning process innovations, information technologies innovations.

- Organizational innovations:

During the reporting period, a transition from study programme's councils of the field to the Study Field Councils. Organizational innovations also include the active transition of the UL towards electronic documentation, taking place within the framework of the existing UL information system (ULIS). The system of curators has been renewed for the first-year bachelor's students. The so-called metacourses of the e-study environment are used to notify and inform students.

- Marketing innovations:

The marketing innovations of the study programmes are managed by the UL Communications Department. Within the study field, close coordination of activities is realised in order to make the process more efficient; promotion of study programmes is performed in connection with other exact study programmes of the UL. The cooperation is enhanced by the location in the UL Academic

Centre in Torņakalns.

- Infrastructure innovations:

The main innovation in infrastructure development is the creation of the UL Academic Centre in Torņakalns, where currently located nearby are the House of Nature and the House of Science; it is expected that within two years they will be joined by the House of Letters. The UL is also actively working on other intentions: the House of Technologies, the House of Sports, etc. In addition to modern, "European-level" facilities, the modernization of teaching and research infrastructure at the equipment level has also been implemented.

- Learning process innovations:

During the last two years, the situation related to COVID-19 stimulated the active learning process at remote studies and the improvement of study materials, including the creation of video recordings of lectures. The implementation of the student-centred study process continues, using the opportunities for the development of teaching staff provided by the EdX platform distance courses "An Introduction to Evidence-Based Undergraduate STEM Teaching" and "Advancing Learning Through Evidence-Based STEM Teaching", as well as by organising internal seminars for the experience exchange of teaching staff. The UL has offered the opportunity for teaching staff to improve both their English knowledge and their skills in using various IT tools. The UL continues to improve the study e-environment options (in the Moodle system). It is being connected to Microsoft Teams (MS Teams).

Each of the study programmes has its own individual innovations described in the chapters related to the study programmes' characteristics.

- Information technology innovations:

These innovations include the improvement of ULIS mentioned above, the widespread use of electronic documents and the related use of e-signature, innovations of the e-studies environment, its connection with MS Teams. Significant IT innovations include the common provision of certain software throughout the UL (*Microsoft Office 365*, *SPSS*, *Autodesk*, *ANSYS*, *Gaussian*, *MathWorks MatLAB*, *Esri ArcGIS*, *Thomson Reuters EndNote*, *Question Pro*). Among the innovations at the level of the Departament of Environmental Science is the transition to computer programming environments (languages) like *R*.

2.5. Cooperation and Internationalisation

2.5.1. Provide the assessment as to how the cooperation with different institutions from Latvia (higher education institutions/ colleges, employers, employers' organisations, municipalities, non-governmental organisations, scientific institutes, etc.) within the study field contributes to the achievement of the aims and learning outcomes of the study field. Specify the criteria by which the cooperation partners for the study field and the relevant study programmes are selected and how the cooperation is organised by describing the cooperation with employers. In addition, specify the mechanism for the attraction of the cooperation partners.

The content of the study field is created in close cooperation with the social partners of the industry (Annex 13), participating in the development of the content of the study programme, preparing self-evaluation reports, as well as giving guest lectures during the studies. A significant element of the study content is study tours, during which students are introduced to the institutional system of environmental protection, the EU environmental protection issues, as well as the application of environmental technologies. During study tours, students regularly get acquainted with the operation of wastewater treatment plants, waste management issues, environmental management solutions in protected areas, the operation of the Latvian Environment, Geology and Meteorology Centre and other institutions involved in environmental protection. Study programmes include internship – applied studies. The duration of the internship provides opportunities to get acquainted with the operation of the chosen institution and to perform tasks independently under the supervision of the local manager. In order to successfully implement the internship and achieve the planned results of the professional activity, the SF EP has concluded a total of 17 internship provision contracts. Students can also find another option for the internship regardless of the signed contracts, thus the number of companies providing internships is much larger. During the studies, prospective internship providers are invited to inform the students about their company, in order to give the students a notion of job opportunities in the field and giving them the opportunity to choose firstly a place for internship and then, possibly, a workplace.

For many students, the internship becomes their first workplace. Internship can also be implemented at a scientific institute, meaning that a student gains actual scientific experience by working with existing data from experiments and observations. At the end of the internship, the student receives a review and evaluation from the internship-providing institution. These reviews serve as feedback revealing how knowledgeable, skilled and capable the student has been during the internship. The employees of the internship-providing companies can also participate in the defence of the internship report; they can indicate on what else knowledge students should acquire at the university. The results of the employers' survey conducted in 2022 reveals that employers are satisfied with the graduates of the SF EP and that, in general, when describing the SF EP graduates working in the company being graduated in the last 3 years, they were capable to perform their work duties after a short training/introduction to the workplace. While looking for internships for students, where they could gain not only professional experience, but also new theoretical knowledge, fruitful cooperation has been established with many UL institutes, Latvian State Forests Research Institute "Silava", Hydroecology Institute of Latvia and others. The cooperation partners, including universities, of the study field are selected: 1) taking into account the complementarity of competence and the directions of practical activity, as well as the possible contribution to the achievement of the goals of the study field. The mentioned criteria refer to: 1. compliance of scientific profile with the direction of environmental protection and quality of scientific activity (international assessment >3); 2) functions in the Latvian environmental protection system and contribution to ensuring the study process; 3) existing cooperation experience in Latvian and international cooperation networks. Among universities of Latvia, close cooperation has been developed with Riga Technical University, Daugavpils University, Latvia University of Life sciences and Technologies.

Collaboration with institutes promotes the involvement of students in scientific projects, thus providing students with actual experience of scientific work.

Teaching staff of the SF EP prove their professional competence by working in both professional and non-governmental organizations, such as the Latvian Geographical Society, the Latvian National Peat Society, the Association of Latvian Young Scientists, the Association of Professors in Higher Education Institutions of Latvia, etc. Professors M. Kļaviņš, O. Nikodemus, V. Melecis and assoc. prof. G. Spriņģe are members of the Latvian Academy of Sciences. All the mentioned organizations

not only unite members of interest, they also perform educational activites by organising scientific and professional readings and seminars, and conferences. The teaching staff of the Department of Environmental Science are involved in collaboration with schools of Latvia. Education of the society in Latvia about current issues of environmental protection takes place through various events; among the popular events is “The Night of Scientists”.

2.5.2. Provide the assessment as to how the cooperation with different institutions from abroad (higher education institutions/ colleges, employers, employers’ organisations, municipalities, non-governmental organisations, scientific institutes, etc.) within the study field contributes to the achievement of the aims and learning outcomes of the study field. Specify the criteria by which the cooperation partners suitable for the study field and the relevant study programmes are selected and how the cooperation is organised by describing the cooperation with employers. In addition, specify the mechanism for the attraction of the cooperation partners.

The UL has concluded 20 cooperation agreements with foreign universities for Erasmus+ studies in environmental science (Table 2.5.2.1). The criteria for attracting foreign cooperation partners are the relevance in respect to promotion of mobility of academic staff and students, the development of cooperation in research and opportunities for learning the best practices of study content and methods. Foreign cooperation partners are attracted using: 1) participation in international cooperation networks (for example, Baltic University Program, European School of Sustainability Science and Research, Forthem), COST and other cooperation projects; 2) Attracting research project partners; 3) using the cooperation opportunities offered by the EU with nearby and other neighboring countries. The agreements are regularly updated. At the beginning of each semester, the UL FGES holds discussions with students about the opportunities of participating in the Erasmus+ mobility programme. The discussions inform about the partner universities, scholarships and general conditions, as well as about the success stories of students who have already participated in the exchange programme Erasmus+. Information is also distributed by e-mailing. Interested students are invited to submit a motivation letter and an application form. The application criterion is the weighted average grade for the last semester; it must be not less than 7 points. After receiving the applications, the voting of the UL FGES commission is organized, where each member votes for/against each applicant. Approved applications are forwarded for mobility implementation.

New cooperation partners (higher education institutions) are sought using the faculty’s scientific contacts, as well as cooperation offers from other universities are accepted if the relevant faculty of the particular university meets the UL criteria.

Table 2.5.2.1.

The list of Erasmus+ agreements in the SF “Environmental protection”

No	University (Country)	The field of Erasmus agreement
1.	Aarhus Universitet (Denmark)	*Erasmus+, Earth sciences*

2.	Talence Campus College of Science & Technology Previously: Universite Bordeaux I (France)	*Erasmus+, Earth sciences*
3.	Université de Lorraine (France)	*Erasmus+, Earth sciences*
4.	Università degli Studi di Padova (Italy)	*Erasmus+, environmental science*
5.	Utrecht University (Netherlands)	*Erasmus+, all fields*
6.	Adam Mickiewicz University of Poznan (Poland)	*Erasmus+, environmental science*
7.	Nicolaus Copernicus University (Poland)	*Erasmus+, Earth sciences*
8.	University of Ljubljana (Slovenia)	*Erasmus+, environmental science*
9.	University of Nova Gorica (Slovenia)	*Erasmus+, environmental science*
10.	University Eastern Finland (Finland)	*Erasmus+, environmental science*
11.	Universidad de Alcalá (Spain)	*Erasmus+, ecology*
12.	Universidad de Huelva (Spain)	*Erasmus+, environmental science*
13.	Aksaray University (Turkey)	*Erasmus+, environmental protection and technologies*
14.	Canakkale Onsekiz Mart University (Turkey)	*Erasmus+, environmental engineering*
15.	Leuphana Universität Lüneburg (Germany)	*Erasmus+, environmental science*
16.	Albert Ludwigs Universität Freiburg (Germany)	*Erasmus+, Earth sciences*
17.	Georg August University Göttingen (Germany)	*Erasmus+, Earth sciences*
18.	RWTH Aachen University (Germany)	*Erasmus+, Earth sciences*
19.	Linnaeus University (Sweden)	*Erasmus+, environmental science*
20.	University of Helsinki (Finland)	*Erasmus+, all fields*

The UL is one of the partner universities of the FORTHEM Alliance. At the end of December 2021, all involved universities have signed the multilateral agreement. FORTHEM Alliance provides the mobility of university lecturers (e.g., assoc. prof. I. Šteiberga has visited University of Jyväskylä in Finland and a return visit in the UL has occurred) as well as student exchange and project development.

The SF EP holds a series of bilateral cooperation agreements with foreign institutions, marking close ties in the research; among such cooperation agreements can be mentioned an agreement with the National University of Food Technology in Ukraine (2022), Linnaeus University (Sweden) (2018), the Academy of Sciences of Shaanxi province in China (2022), the Estonian Academy of Arts (2023) and others. Certainly, the collaboration partners abroad include those with whom cooperation takes place within the framework of research projects. A great part of teaching staff has visited foreign universities for shorter or longer periods (see the Annex of the CV's of teaching staff); many are on the editorial boards of scientific journals; many are engaged as peer reviewers for scientific journal articles.

Teaching staff of the SF EP are involved in many international societies and organizations, such as International Association for Landscape Ecology (IALE), International Humic Substances Society, SCORAI-Europe, INTECOL, the Clay Minerals Society (CMS), the European Association of Geoscientists and Engineers (EAGE), the European Geochemistry Association (EGA), the Society for Olfaction and Chemical Sensing, International Association for Urban Climate.

2.5.3. Specify the system or mechanisms, which are used to attract the students and the teaching staff from abroad. Provide the assessment of the incoming and outgoing mobility of the teaching staff in the reporting period, the mobility dynamics, and the issues which the higher education institution/ college faces with regard to the mobility of the teaching staff.

Until now, the UL FGES has not taken particular measures to attract foreign students, because the UL has a separate structural unit dealing with students' recruitment. The main and most widely applied mechanism for attracting foreign students is cooperation with recruitment agencies abroad working in the respective countries. The faculty creates informative materials, maintains the faculty's website in English, which contains information about study opportunities, the application procedure and all questions of interest to foreign students.

Several mechanisms are used to attract foreign teaching staff: 1) international tenders for vacant teaching staff positions (first of all, this applies to the positions of professors and tenured professors); 2) recruitment of foreign teaching staff within the framework of the renewal and competence improvement projects of the academic staff of the UL; 3) expanding the contacts established as a result of international scientific cooperation by attracting researchers as teaching staff.

The attraction rate of foreign students and foreign visiting teaching staff during the reporting period in the SF EP has been small (Annexes 14 and 15). In total, 57 foreign students have studied at the SF EP during the reporting period (see **Table 2.5.3.1**). Up to now, the engagement has been realised through the Erasmus+ mobility programme.

Table 2.5.3.1.

The number of persons studying abroad

Substantiation / Academic year	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Total in the field	**11**	**3**	**14**	**7**	**2**	**10**	**3**
For acquisition degree or qualification	-	-	-	-	-	-	-
In exchange programmes	11	3	14	7	9	10	3

When analysing the number of outgoing students at the EF EP during the reporting period (see **Table 2.5.3.2**), it can be concluded that the number has decreased over time. This could only be explained by the fact that in the first years, students are not going to study abroad, but when the time for mobility is more appropriate, work relationships have been started in parallel with the studies, which would not be desirable to terminate due to financial reasons.

Table 2.5.3.2.

The number of persons outgoing for studying

Substantiation / Academic year	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Total in the field	6	10	4	6	8	5

The incoming and outgoing mobility of teaching staff takes place using ERASMUS programs and research cooperation opportunities, as well as participation in the FORTHEM program. In recent years, the mobility of teaching staff has been affected by the Covid-19 pandemic and the consequences of the war in Ukraine. At the same time, after the reduction of restrictions determined by objective factors, work is being done to activate mobility.

In order to implement the project “Renewal of academic staff and improvement of competences at the University of Latvia” related to the ESF specific support goal No 8.2.2. “To Strengthen Academic Staff of Higher Education Institutions in the Areas of Strategic Specialization”, during the period from 2018 to 2022, several foreign university lecturers were attracted to the status of visiting university lecturers at the UL FGES, providing the quest lectures and important elements of the study course. In 2018/2019, assoc. prof. Mait Kriipsalu from the Estonian University of Life Sciences (Estonia) has taught the study course “Waste management” and has conducted the lectures in the course “Water supply and wastewater treatment”, prof. Gerd Michelsen from the Leuphana University Lüneburg (Germany) has worked as a visiting professor (for 6 months in autumn semester of 2019) at the UL FGES – he has conducted the guest lectures in bachelor’s, master’s and doctoral study programmes on the topics such as management of sustainable development, environmental management, environmental communication, environmental education; he has also advised the elaboration of master’s and doctoral theses and has participated in field works. Assoc. prof. Zenonas Gulbinas from Vilnius University (Lithuania), has conducted a series of guest lectures to master’s and doctoral students on the preparation of scientific project applications and has organized a regional study course for master’s students in Lithuania.

2.6. Implementation of the Recommendations Received During the

Previous Assessment Procedures

2.6.1. Assessment of the fulfilment of the plan regarding the implementation of the recommendations provided by the experts during the previous accreditation of the study field, as well as the assessment of the impact of the given recommendations on the study quality or the improvement of the study process within the study field and the relevant study programmes.

During the previous visit of accreditation experts (in 2012), 3 recommendations were given, which were fully implemented. The changes made are primarily related to the cardinal improvement of the studies' infrastructure and a significant increase in the amount of research, as well as an increase in its importance in the implementation of research-based studies. At the same time, it should be noted that this process is still actively continuing. In the all study programmes of the SF EP, the content of natural sciences is strengthened, while in the programmes of environmental science, the scope and content of the engineering study course has also been strengthened and expanded. Related activities, due dates and detailed characteristics are given in recommendation annex and in **Table 2.6.1.1**.

Table 2.6.1.1.

Implementation of the recommendations given in the previous accreditation

No	Recommendation	Activity	Achievable result	Due date	The responsible	Implementation of the recommendation
1.	The need for a new building for studies, renewal of infrastructure to implement the role of environmental education in Latvia	Construction of the UL Academic Centre (involving the House of Nature); appropriate technical support for studies	New study centre has put into service	Since 2015	-	Accomplished, put into service since September of 2015

2.	Integration of the aspects of engineering sciences into the studies	Re-evaluation of study courses, updating, inclusion of new issues relevant to engineering sciences in the existing study courses	Annual updating of study courses	Annually, since 2013	O. Nikodemus, I. Kukuļs, I. Šteinberga	The aspects of engineering sciences are integrated in the study course of the bachelor's study programme "Environmental technology", in the master's study courses "Water supply and wastewater treatment", "Biotechnology and sparing technologies", and other study courses
3.	To transform the study programme "Environmental management", offered by the UL Faculty of Business, Management and Economics, into the master's study programme; to create the specialisation "Management, administration and real estate management"	Transformation of the study programme "Environmental management", its involvement into the UL FGES study programme	Transformed study programme	Since 2013	The UL Faculty of Business, Management and Economics; the UL FGES	In 2013, the study programme was integrated into other study programmes in accordance with the recommendation

2.6.2. Implementation of the recommendations given by the experts during the evaluation of the changes to the study programmes in the respective study field or licensed study programmes over the reporting period or recommendations received during the procedure for the inclusion of the study programme on the accreditation form of the study field (if applicable).

Both, short-term and long-term recommendations were issued for the study program "Research and protection of Cultural and Environmental Heritage" during the process of licensing the study program and inclusion of the study program in an accredited study field. The implementation of the recommendations has been already done or currently are in the process of implementing. Detailed review on implementation of the recommendations is included in the Table 2.6.2.1.

In general, the recommendations expressed during the process of licensing and inclusion of the study program in the accredited study field have been largely implemented or are in the process of being implemented. Taking into account the suggestions made by experts, changes have been made in the content of study courses and the study plan, some study courses have been combined in order to reduce the total number of study courses and work on the study course content will continue also during the approbation of the study program. Also, the name of the study program has been changed to "Research and protection of Cultural and Environmental Heritage" in both languages – English and Latvian. A cooperation agreement between UL and LMA on the implementation of the study program is in the process of development, work is underway on expanding the international cooperation network and popularizing the study program to attract new students not only from Latvia, but also from abroad.

In addition to the recommendations issued by the experts, in the decision on the inclusion of the study program in the study field, it was proposed to evaluate the possibility of revising the name of the awarded degree to ensure its compliance with the requirements of the Cabinet of Ministers' regulation no. 240, ensuring the linking of the name, content and achievable results of the Study Program. The discussion on changing the name of the awarded degree took place when deciding on the new name of the study program, however, a final decision regarding the name of the awarded degree has not yet been made, as it would require a wider evaluation, which is planned to be completed by the end of the current accreditation term of the study field.

Table 2.6.2.1.

The implementation of the recommendations suggested by the experts for the academic bachelor's study programme "Cultural and environmental heritage"

No	Recommendations of the Expert Group	Activity of the Higher Education Institution/College	Results to be Achieved	Implementa-tion Date	Implementation of the recommendation
1.	Inclusion of visual anthropology and visual semiotics in the programme, which could serve as a unique link between the approaches of natural sciences and art sciences and may increase the interest of international students.	This expert group recommendation was considered, and changes have been made to the study programme by attracting the relevant lecturers of the Faculty of History and Philosophy (FHP) of the UL. In the academic year of 2022/2023, the responsible persons of the faculties have discussed this issue.	Revised content of study courses.	Until the accreditation of the study programme.	Since the questions of visual semiotics are already included in the content of the course "Theory of Styles and Structures of Art and Architecture", in cooperation with the lecturers of the FHP of the UL, it is planned to supplement the content of this course with topics of visual anthropology after the academic year of 2022/2023, as the course is currently being implemented; therefore, immediate changing of the content is not possible.

2.	Orientation of humanities courses to environmental philosophy,	In the academic year of 2022/2023, it was planned to hold an inter-faculty discussion in which the content of study courses would be discussed.	Revised content of study courses.	Until the accreditation of the study programme.	An inter-faculty discussion is possible only after the end of the academic year of 2022/2023, aiming to identify the results and perform a critical SWOT analysis. Focusing study course topics on issues of environmental philosophy is planned in later stages of studies after the introductory courses of humanities are completed.
3.	Reducing the number of currently many courses by combining them, primarily if the subjects are taught by the same lecturer and the content of the courses taught by the lecturer is close, or the elimination of courses that overlap by content,	This recommendation of the expert group is accepted for information. During the approbation of the programme, the content of the study courses undergoes evaluation, and overlapping courses' content will be eliminated.	Work on combining study courses.	Until the accreditation of the study programme.	Currently, 6 study courses have already been combined, and by continuing the study programme approval and evaluating the study process results, the number of study courses can be reduced.

4.	The possibility of teaching the German language also for students with prior knowledge; a small historical insight into the history of the Latin language can be added to the content of the Latin language course, as well as practical suggestions on how to recognise and understand the Latin language of different times, even if only in writing.	Considering students' possible interests, the Faculty of Humanities of the UL already offers German language study courses at the higher level and other foreign language study courses for beginners and advanced students.	An opportunity is provided for students with prior knowledge of the German language to choose another study course. Latin language course is supplemented.	Until the accreditation of the study programme.	Changes have been made to the study plan, combining the previously planned German language courses in the "German Studies" block, intending that students with prior knowledge can choose other substantive study courses related to the German language in the future. The first topic of the description of the Latin language study course has been supplemented to provide an insight into the history of the Latin language and its meaning in the development of the European cultural space, an overview of the characteristics of the Latin language in the evidence of different times and providing practical recommendations for their identification.

5.	Following criteria I 1 and III 1, evaluate the possibility of implementing a methodological course that would cover all the sciences included in the programme, show their specificity and allow later to understand and learn the different methods used in them, as well as to understand their interrelationships.	Research methodology questions will be included in the study course “Introduction to Studies”. Also, the learning of interdisciplinary methodology will be ensured within the courses “Development of a Bachelor’s Thesis Topic Project” and “Development of a Bachelor’s Thesis Project”.	The content of the study programme includes topics of interdisciplinary methodology.	Until the accreditation of the study programme.	Questions about research methodology are intended to be especially emphasised in the study course “Introduction to Studies”. It will be possible to realise until the next academic year of 2023/2024 as this course is currently being implemented. The content of the course will be supplemented by switching to the ECTS system when the course “Introduction to Studies” (1 CP) will be increased to 2 ECTS. Questions of visual art methodology are already included in the content of the courses “The Methods of Graphic Expression”, “Theory of Styles and Structures of Art and Architecture”, and “Questions of Contemporary Visual Art Theory”. The course “Development of a Bachelor’s Thesis Topic Project” has also been supplemented accordingly. As a result of the expected substantive changes, the interrelationships of the methodological issues of various branches of science included in the study programme will be emphasised.

6.	According to criterion II 2, providing a certain number of copies per semester can be considered as a free-of-charge service.	Currently, the fee for making copies is applied to all students, regardless of the study programme. The price for copying in the UL Libraries is determined according to the price list of paid services of the UL Library, which has been approved by the UL's Order No.1-4/387 (on August 10, 2021) on the prices of the paid services of the UL Library. During the approval of the study programme, it is possible to discuss this issue with the UL management.	Discussions with the UL's management regarding determining the number of free-of-charge copies for programme students.	Until the accreditation of the study programme.	Discussions with the UL's management regarding determining the possible number of free-of-charge copies were conducted, but the UL Library services price list has not yet been amended. At the same time, it should be emphasised that students also have access to a scanner at the library, with the help of which it is possible to scan the necessary materials free of charge.
7.	According to criterion IV 2, all teaching staff implementing the programme must have at least a B2 level of English language proficiency.	Currently, within the ESF project No.8.2.2.0/18/A/010, "Renewal of Academic Staff and Development of Competencies at the University of Latvia", the lecturers with the English knowledge level lower than B2 are improving their professional English language knowledge in training in the amount of 216 hours, after the final exam receiving the appropriate certificate.	Conformity of the English language knowledge of all teaching staff involved in implementing the programme to at least level B2.	Until the accreditation of the study programme.	Part of the teaching staff involved in the study process continues improving their English language skills. At the same time, as indicated in the English language version of the full-time study plan of the study programme, the teaching of study courses in English is provided only by those lecturers whose English language level is B2 and higher.

8.	Following criteria III and V 9, work should be done on the content and informational adaptation of study course descriptions in English for teaching international students.	During the approval of the study programme, the descriptions of study courses in English will be reviewed and corrected.	Descriptions of study courses in English are revised.	Until the accreditation of the study programme.	All study courses' descriptions in English were revised, and the errors found were corrected.

Annexes

I - Information on the Higher Education Institution/ College		
Information on the implementation of the study field in the branches of the higher education institution/ college (if applicable)		
List of the governing regulatory enactments and regulations of the higher education institution/ college	1P_list_of_normative_acts.docx	1.pielikums_Saraksts_ar_galvenajiem_augstskolas_ieksejiem_normativajiem_aktiem_un_regulejumiem_LV_ENG_03-04-2024.docx
The management structure of the higher education institution/ college	2P_Management structure of UL.docx	2P_LU_parvaldibas struktura.docx
II - Description of the Study Field - 2.1. Management of the Study Field		
Plan for the development of the study field (if applicable)	3P_Aims and development plan (ENG).docx	3P_Att_plans_un_merki-1.docx
The management structure of the study field	4P_Management_study_field.docx	4P_Virziena parvaldibas struktura.docx
A document certifying that the higher education institution or college will provide students with opportunities to continue their education in another study programme or another higher education institution/ college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.	Declaration.zip	Progr_paṃ.zip
A document certifying that the higher education institution or college guarantees compensation for losses to students if the study programme is not accredited or the study programme license is revoked due to actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.	JD_compensation_policy_statement_environmental_protection.docx	23.04.2024 - 71-61_7 - Rektora apliecinājums par kompensāciju SV "Vides.edoc
Standard sample of study agreement	Agreements.zip	8P_Liguma paraugs.docx
II - Description of the Study Field - 2.2. Efficiency of the Internal Quality Assurance System		
Analysis of the results of surveys of students, graduates and employers	Feedback.zip	Aptauju_rez.zip
II - Description of the Study Field - 2.3. Resources and Provision of the Study Field		
Basic information on the teaching staff involved in the implementation of the study field	13P_Staff.xlsx	13P_Personals.xlsx
Biographies of the teaching staff members (Curriculum Vitae in Europass format)	CV_ENG.docx	CV_LV.docx
A statement signed by the rector, director, head of the study programme or field that the knowledge of the state language of the teaching staff involved in the implementation of the study programmes within the study field complies with the regulations on the state language knowledge and state language proficiency test for professional and official duties.	Valsts_val_ENG.zip	valsts valoda_LV.zip
A statement of the higher education institution/ college on the respective foreign language skills of the teaching staff involved in the implementation of the study programme at least at B2 level according to the European Language Proficiency Assessment levels (level distribution is available on the website www.europass.lv, if the study programme or part thereof is implemented)	Angļu_val_ENG.zip	Angļu_val_apliec.zip
II - Description of the Study Field - 2.4. Scientific Research and Artistic Creation		
Summary of quantitative data on scientific and/ or applied research and / or artistic creation activities corresponding to the study field in the reporting period.	15P_Research performance staff (ENG).docx	15P_Kvantitat_dati.docx
List of the publications, patents, and artistic creations of the teaching staff over the reporting period.	16P_Publicat_of_staff.docx	16P_Akad_pers_publik.docx
II - Description of the Study Field - 2.5. Cooperation and Internationalisation		
List of cooperation agreements, including the agreements for providing internship	18P_Cooperation_Agreements.docx	18P_Sadarbības līgumi.docx
Statistical data on the teaching staff and the students from abroad	17P_Statistic_foreign.pdf	17P_statistika_parārvalstu.pdf
Statistical data on the incoming and outgoing mobility of students (by specifying the study programmes)	19P_Statistics about mobility of students and staff (ENG).docx	19P_Statistikas_dati.docx
Statistical data on the incoming and outgoing mobility of the teaching staff	20P_Mobility of staff.docx	20P_Mācībspēku_mobilitāte.docx
II - Description of the Study Field - 2.6. Implementation of the Recommendations Received During the Previous Assessment Procedures		
Report on the implementation of the recommendations received both in the previous accreditation and in the licensing and/ or change assessment procedures and/ or the procedures for the inclusion of the study programme on the accreditation form of the study field.	21P_Implement_Recommend.docx	21P_Rekomend_izpilde.docx
An application for the evaluation of the study field signed with a secure electronic signature	Akreditacijas_iesniegums_Environmental_Protection.pdf	Iesniegums AIC studiju virziena _Vides aizsardzība_ novērtēšanai (Z.Krišjāne).edoc
III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme		
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period		
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard		
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme		
The curriculum of the study programme (for each type and form of the implementation of the study programme)		
Descriptions of the study courses/ modules		
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		

Other annexes

Name of document	Document
Latvijas Universitātes profesoru padomes nolikums	Latvijas Universitates profesoru padomes nolikums.pdf
Kārtība par nevēlēto mācībspēku un zinātnieku pieņemšanu darbā Latvijas Universitātē	Kartība par neveleto macibspeku un zinatnieku pieņemsanu darba Latvijas Universitate.pdf
LU Kvalitātes vadības rokasgrāmata	LU_KVS_rokasgramata.pdf
UL Quality Management Manual	LU_QMS_Manual.pdf

Environmental Science (45431)

Study field	*Environmental Protection*
ProcedureStudyProgram.Name	*Environmental Science*
Education classification code	*45431*
Type of the study programme	
Name of the study programme director	*Iveta*
Surname of the study programme director	*Šteinberga*
E-mail of the study programme director	*iveta.steinberga@lu.lv*
Title of the study programme director	*Dr. geogr.*
Phone of the study programme director	
Goal of the study programme	*To prepare highly qualified and competitive, including on an international scale, environmental science specialists of master's level for the labour market, offering and providing the opportunity to specialize during studies in national-level and internationally relevant subfields of environmental science with high research and innovation potential, promoting interdisciplinary development.*
Tasks of the study programme	*To achieve the general goal, the following main tasks have been set for the study programme:* *1. Opportunities are provided to acquire knowledge and develop skills in one of the sub-fields or directions of environmental science (nature protection, environmental management, environmental chemistry and ecotoxicology, environmental engineering), as well as a notion of the general development trends of environmental science;* *2. To develop competencies that are essential for ensuring competitiveness in the labour market, to gain knowledge and create an understanding of the fundamentals of innovative activity;* *3. To promote the skills to perform individual tasks and work in groups;* *4. To develop research skills by conducting scientific research under the guidance of academic staff and summarizing its results in a master's thesis.*

Results of the study programme	*Knowledge* *1. Demonstrates expanded knowledge and understanding of approaches used in environmental science and the essential terminology in interpreting and solving various problem situations.* *2. Capable of demonstrating in-depth knowledge of the theories, concepts, and methodologies of a sub-field of environmental science.* *3. Know the scope of studies required for independent research and the methodological frameworks necessary for solving environmental science problem situations in research and professional activity.* *Skills* *4. Formulates and solves problems in the field of environmental science, using the approach of critical thinking and applying the latest or innovative methods in solving problems, using the approach and methodology of the relevant field of environmental science to perform research or applied work.* *5. Can competently and safely choose appropriate modern technologies, able to use information technologies for the performance of work duties, research and lifelong learning, as well as acquisition, creation and sharing of digital content.* *6. Capable to independently promote the improvement and specialization of own competencies, takes responsibility for the work results of personnel groups and their analysis.* *Competence* *7. Can formulate and critically analyse complex scientific and professional problems and independently justify proposed solutions with arguments.* *8. Integrates the knowledge of environmental science and related disciplines contributing to creating new knowledge and developing research methods.* *9. Demonstrates understanding and ethical responsibility for the possible impact of scientific results on the environment and society.* *10. Argumentatively explains and discusses integrated or systemic aspects of the field of environmental science with both specialists and non-specialists. Capable to work in a group, presenting and arguing own point of view, and reaching a compromise in formulating the group's point of view.*
Final examination upon the completion of the study programme	*Master's thesis.*

Study programme forms

Full time studies - 2 years - latvian

Study type and form	*Full time studies*
Duration in full years	*2*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*80*

Admission requirements (in English)	*First-cycle higher education or equivalent higher education in natural sciences, environmental science, engineering, agricultural sciences, or forestry; entrance examination.*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Master's degree of Natural Sciences in Environmental Science*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
University of Latvia	RĪGA	RAIŅA BULVĀRIS 19, CENTRA RAJONS, RĪGA, LV-1050

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

During the reporting period, several changes have been made to the master's study programme "Environmental science", which ensure the compliance of the programme with the changes in regulatory acts, i.e., the achievable study outcomes have been specified in accordance with the regulations of the Cabinet of Ministers No 322 "On the Classification of Education in Latvia" (June 13, 2017, available only in Latvian); the content of the programme has been updated, taking into account the changing labour market and student interests. The most significant changes during the reporting period can be divided into several directions:

- **inclusion of new scientific findings and current issues in the study programme** – several study courses are included, which cover topics of sustainable development and innovation, development trends within the framework of the "European Green Course", climate change management and adaptation options, management of the Baltic Sea, sustainable waste management and circular economy (study courses – "Sustainability and innovations" 4 CP/ 6 ECTS; "Environmental protection tools for the Baltic Sea" 2 CP/ 3 ECTS; "Climate change management: approaches and tools" 4 CP/ 6 ECTS; "Sustainable waste management in the context of circular economy" 4 CP/ 6 ECTS);
- **improvement of student skills and competencies, including application of information technologies** – topics and practical activities included in existing and new study courses to improve the use of specific to field computer programmes (e.g., ArcGIS) and ICT tools, environmental data acquisition methodology, data quality and control algorithms, specifics of processing large data sets, development and implementation of environmental projects, creating an idea of European environmental policy, its framework, functioning mechanisms, as well as to acquire the specifics of environmental communication, the transfer of field-related information in various information spaces (study courses – "ArcGIS Pro, cartography and spatial representations" 4 CP/ 6 ECTS; "Environmental communication" 2 CP3 ECTS; "Environmental project management" 4 CP/ 6 ECTS; "European environmental policy: theory and practice" 2 CP/ 3 ECTS).

Students who have obtained their bachelor's degree in a field indirectly related to environmental science must take a knowledge levelling course ("Environment and civil defence" 4 CP/ 6 ECTS) in the first semester in order to be able to acquire other specific environmental science courses more fully.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of

the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

The academic master's study programme "Environmental science" has been developed and is implemented in the Department of Environmental Science of the UL FGES, as one of the stages of a full-cycle academic education in environmental science. The programme was accredited for 6 years on June 5, 2013; and the accreditation was then extended (with amendments to the Law on Higher Education Institutions) until December 31, 2024.

Matriculation requirements are differentiated depending on previous education. Persons with a first-cycle higher education or equivalent higher education in natural sciences, environmental science, engineering, agricultural sciences, or forestry are enrolled in the programme. The right to apply for out-of-competition registration belongs to graduates of the last academic year of the bachelor's study programme "Environmental science" of the UL, whose average weighted grade in bachelor's studies is not lower than 7 (good) and the grade of the bachelor's thesis is not lower than 8 (very good). For other prospective applicants, an entrance exam (interview) is organized, where the person's motivation to study environmental science, understanding of this field of studies, and the potential topic of the master's thesis are examined. This differentiated matriculation approach provides an opportunity to study in the master's programme in environmental science also for persons who practically work in fields related to environmental science, but have obtained a bachelor's degree in more distant fields of environmental science.

The aim of the environmental science master's study programme is to prepare highly qualified and competitive, including for international scale, master's-level environmental science specialists for the labour market, offering and providing the opportunity to specialize during studies in national-level and internationally relevant subfields of environmental science with high research and innovation potential, promoting interdisciplinary development. Such a goal of the study programme is closely related to both the development directions and strategic goals of the UL, as well as the aims of the study direction, and provides opportunities to achieve excellence in science through innovations, to acquire comprehensive knowledge, to improve analytical and critical thinking, while ensuring sustainable development and knowledge transfer at various informative levels.

The implementation of the academic master's study programme "Environmental science" corresponds to the purpose and tasks of the study direction "Environmental protection", as well as the needs and trends of the development of society and the national economy. Its compliance with the direction is determined by the fact that environmental science as a branch of science belongs to the natural sciences, which is also confirmed by the obtainable master's degree in natural sciences. The title of the academic master's study programme "Environmental science", the degree to be obtained, and the qualification to be awarded are interrelated. As follows, the goals and objectives of the programme, as well as study results, which correspond to master's level studies in environmental science, as they allow acquiring in-depth knowledge, skills and competence and directly correspond to the name of the study direction and study programme. The first two digits (45) of the programme's code (45431) describe the study cycle – academic education (master's degree), while the third to fifth digits (431) correspond to the field of study – "Environmental protection'. Therefore, the programme code is designed accordingly.

The knowledge, skills and competences acquired within the study programme correspond to the 7th level of the Latvian Qualifications Framework, this is also confirmed by the attached study course mapping (see the Annex "Study course mapping of the study programme "Environmental science"").

The duration of studies in the study programme is 2 years (4 semesters), during which all students of this programme must complete mandatory study courses (Part A, 46 CP or 69 ECTS), restricted elective study courses (Part B, 30 CP or 45 ECTS) and free elective courses (Part C, 4 CP or 6 ECTS). In order to be able to start studies in the master's programme, a bachelor's degree must be obtained, which in the case of the bachelor's study programme "Environmental science" takes 3 years. Thus, the total duration of higher education for obtaining the master's degree is 5 years, corresponding to the Lisbon Convention (1997), the Bologna Declaration (1999) and other international documents regulating higher education.

The rights to continue academic studies in the master's study programme are in force after completing a bachelor's programme or a second-level professional higher education programme, if the relevant master's study programme admission requirements have been met, which include appropriate prior knowledge for successful completion of the master's study programme.

Admission requirements comply with Clause 14 of the "Regulations Regarding the State Standard for Academic Education" in Latvia. They are relevant to the degree awarded as a result of acquiring the study programme, as it provides the opportunity to study environmental science at the master's level for all interested parties who have a bachelor's degree or equivalent higher education in natural sciences, environmental science, engineering sciences, agricultural sciences or forestry. For those applicants who have obtained previous education in other fields, the ability to study environmental science at the master's level is assessed with the help of an entrance examination.

Competition evaluation formula: weighted average grade (35 x 10 = 350) + total (or average) grade of final examination (35 x 10 = 350) + entrance examination (1 x 300 = 300).

Additional condition: curriculum vitae (CV).

Admission procedure: negotiations, taking into account:

1) grading of entrance examination;

2) motivation for choosing studies, intended research direction;

3) work experience in research, presenting a report at scientific conferences;

4) internship at foreign universities and research institutions;

5) conformity and relevance of the expected topic of the master's thesis to current directions of environmental science research;

6) prework in master's thesis elaboration.

During the entrance examination, the commission questions the persons to be enrolled and takes into account:

1) evaluation of the answers to the entrance examination questions;

2) motivation for choosing studies, intended research direction;

3) work experience in research, presenting a report at scientific conferences;

4) internship at foreign universities and research institutions;

5) conformity and relevance of the expected topic of the master's thesis to current environmental science research directions;

6) prework in master's thesis elaboration.

A grading is assigned for each of these points, and the overall result of the entrance examination is included in the formula for calculating the competition score.

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

In Latvia, the study field “Environmental protection” is implemented at the master’s level by several universities: University of Latvia (UL), Riga Technical University (RTU), Liepāja University (LiepU), Latvia University of Life Sciences and Technologies (LBTU) and Daugavpils University (DU). Different study programmes are offered in each of the universities:

- academic master’s study programme “Environmental science” (UL);
- professional master’s study programme “Eco-technologies” (LiepU);
- academic master’s study programme “Environmental engineering” (RTU);
- professional master’s study programme “Environmental planning” (DU);
- academic master’s study programme “Environmental, water and land engineering” (LBTU).

For comparison, the number of students in each of the study programmes is given in Table 3.1.3.1.

Table 3.1.3.1.

Number of students in various master’s study programmes

Year	University				
	UL	**LiepU**	**RTU**	**DU**	**LBTU**
2017/2018	**66**	21	41	31	31
2018/2019	**56**	33	35	31	29
2019/2020	**54**	29	36	29	36
2020/2021	**56**	19	40	*	37
2021/2022	**59**	*	*	*	38

* *public information not available*

It is obvious that the academic master’s study programme at the University of Latvia is the most popular, as evidenced by the highest number of students.

However, each study programme has its specificity; the uniqueness of the study programme implemented at the University of Latvia is related to the interdisciplinary approach. Graduates have gained competence in various fields of environmental science, the ability to connect environmental fields, intelligent technologies, circular economy, territory management, territory and spatial development planning; they can apply specifics to the industry computer programmes, have ICT skills, which are proven in all necessary stages of work, – from research and work planning, data collection and compilation, processing and interpretation, as well as in publicity activities. The quality of the study programme is confirmed by the high demand of graduates in the labour market

and their ability to compete. The graduates' labour market consists of:

- higher-level legislative institutions (European Commission, Saeima of the Republic of Latvia),
- territorial and environmental management institutions (Ministry of Regional Development and Local Government Affairs, Ministry of Environment, State Regional Development Agency, Latvian Environment, Geology and Meteorology Centre, LGIA),
- municipalities,
- regional environmental administrations,
- environmental consulting enterprises,
- research institutes (at the University of Latvia: Faculty of Geography and Earth Sciences, Faculty of Biology; Institute of Biology; at Daugavpils University: Hydroecology Institute of Latvia, Latvia University of Life Sciences and Technologies, Latvian State Forests Research Institute "Silava", etc.),
- manufacturing companies (e.g., UPB group),
- planning and design companies (e.g., RailBaltic, LNK Industries, etc.),
- non-governmental organizations.

It is important to note that the programme prepares specialists for extensive scientific research in the environmental field or its subfields, which is provided by science base and performance funding, funding of the Latvian Council of Science, other research grants provided by Latvia and the European Union, as well as contract works.

The compliance of the programme with the demand of the labour market is supported by the results of regularly conducted graduates' surveys. In the last survey, in January-February 2023, 17 respondents graduated from the programme during 2016-2022, while 16 respondents participated in the annual graduates' survey in May 2022.

The last graduates' survey of the master's study programme was created on the Google Forms platform; annual graduates' surveys are conducted in the E-studies environment. The analysis of the obtained results reveals that 96% of the respondents are working paid jobs in the industry related to the study programmes, and only two graduates are not working in the field, citing, in their opinion, too low salary in this field. Percentagewise, the largest number of graduates are working in state institutions and research institutes (59%) and in the private sector (29%). 96% of respondents answered positively to the question about the connection between the work and the speciality acquired at the UL FGES. Of the 33 respondents to the question on the relationship between employment and education, the majority (90%) stated that the education they received contributed positively to their employment. Summarizing the results of the survey on employment, it can be accented that a significant majority of graduates of the master's study programme "Environmental science" are employed in the chosen or related speciality.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

During the reporting period, all students in the academic master's study programme "Environmental science" have studied in Latvian, except exchange students, for whom part of the lectures, practical, laboratory, field work and individual consultations were held in English. The studies have mainly been realized by the state public funding, in some cases (until the academic

year 2020/2021), some students were paying tuition fees. Statistics on changes in the number of students are summarized in **Table 3.1.4.1**.

Table 3.1.4.1.

Statistical data on students in the academic master's study programme "Environmental science"

Academic year	Number of students matriculated in the 1st year	Number of students by study years		Total studying	Including, with tuition fee	The number of exmatriculated students (students attrition)	Number of graduates
		1.	2.				
2017/2018	32	35	31	66	1	10	21
2018/2019	28	28	28	56	2	6	21
2019/2020	32	32	22	54	2	13	23
2020/2021	36	36	20	56	0	7	18
2021/2022	31	31	28	59	0	7	15
2022/2023	23	23	30	53	0	7	17

The table summarizes data on October 1 of each calendar year.

The total number of students during the reporting period fluctuated from 53 to 66 (see **Table 3.1.4.1.** or Annex "Statistical data on students involved in the master's study programme "Environmental science" during the reporting period"). Historically, the highest number (13) of exmatriculated students was in the academic year 2019/2020, indicating a very high number in relation to the total number of students. Of these 13 exmatriculated students, nine interrupted their studies because of not meeting the requirements of the study programme in time. Students indicated that they have no motivation to study remotely. But, during individual negotiations, it was found out that a large number of exmatriculated students plan to return and finish their studies after the complete cancelation of the restrictions imposed by the COVID-19 pandemic, emphasizing that intramural studies generate more interest. Financial problems and the inability to combine studies with work are cited as other reasons.

Currently (in the academic year 2023), eleven students are on academic leave; three have passed the theoretical part but have not completed and defended their master's thesis. The data indicate that the number of matriculated students has decreased in the last six years compared to the previous accreditation period, and the number of graduates has also decreased similarly. Several reasons for the decrease in the number of matriculated students exist. Firstly, it is determined by the low demographic indicators of the group of young people who have completed studies, which have influenced the decrease in the number of students already in the bachelor's study programme.

Secondly, it is also affected by the COVID-19 pandemic. The results of the survey of the bachelor's study programme indicate that remote studies have affected the motivation of young people to continue their studies, as well as the threat that master's studies could also take place remotely.

3.1.5. Substantiation of the development of the joint study programme and description

and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The academic master's study programme "Environmental science" has been developed respecting the interrelationship and sequence of study courses, which thus allows achieving the goals of the study programme as much as possible. To ensure this, ten elements of the set of knowledge, skills and competencies to be obtained as a result of acquiring the study programme have been formulated. Taking into account the results to be achieved within the study programme, specific study courses were developed, and the set of knowledge, skills and competencies to be achieved within each individual course was determined. The relationship between the goals and results of the study programme and the results of individual study courses can be found in each study course description, containing a description of the course content, a defined course plan, course acquiring requirements, results, literature to be used (Annex "Description of courses"). The study programme consists of parts A, B and C, which make up 46 CP / 69 ECTS (57.5%), 30 CP / 45 ECTS (37.5%) and 4 CP / 6 ECTS (5.0%), respectively, of the total amount of credit points.

The materials of the courses acquired in the study programme are available to students in various forms – the possibilities of the e-study environment Moodle are intensively used, where lecture materials, practical and laboratory assignments are available; students are also recommended to submit works in this environment. In certain study courses, in order to facilitate the learning of the study material, video tutorials and demonstrations are also placed in the e-study environment, often the lectures are also recorded and these recordings are available for the entire duration of the course.

The mandatory part A of the academic master's study programme "Environmental science" consists of a master's thesis of 20 CP / 30 ECTS and a master's thesis project of 2 CP / 3 ECTS, which directs students in a targeted and timely manner in the selection of the research work topic, the development of goals and tasks. To ensure higher quality elaboration of the master's thesis, the implementation of the programme requires that the development and defence of the master's thesis is divided into several stages: 1) development and defence of the master's thesis project in the 2nd semester and 2) supplementing, improvement and defence of the master's thesis in the 4th semester.

The rest of the mandatory part A in the volume of 26 CP / 39 ECTS consists of 6 study courses:

- upon starting the studies, in the first semester of the course **“Environmental planning”** (VidZ6038, 4 CP / 6 ECTS), students acquire knowledge of the methodological solutions in the planning process and their application in practice, understand and familiarize themselves with environmental impact assessment processes in the context of sustainable development, learn SWOT analysis and other methods to be practically applied in the implementation of the environmental management process and in the development of the territory.
- for getting a comprehensive idea of the development of modern ecosystem theory and the place of human in it, in the first semester, students take the study course **“Ecosystem ecology with the basics in socioecology”** (VidZ5072, 4 CP / 6 ECTS);
- in the second semester, during the course **“Ecotoxicology”** (VidZ5040, 4 CP / 6 ECTS), students gain an understanding of chemical processes and exposure of substances in the environment, which is necessary to assess the mechanism of exposure to one or another polluting substance, the danger, the risk associated with it, as well as to understand the need to carry out environmental protection measures aimed at protecting people, other living organisms and the environment from exposure to foreign substances and opportunities to protect people and the natural environment from exposure to hazardous substances;
- during the course **“Field studies and research methods in environmental science”** (VidZ5224, 4 CP / 6 ECTS) students acquire practical skills in research organization, data collection methodology, data quality control and mathematical processing of large data sets; during the course, students go on field studies, which have been taking place in Latvia and Lithuania in recent years;
- in the third semester, during the course **“Modelling of nature and environmental processes”** (VidZ5039, 4 CP / 6 ECTS), students acquire the mathematical assessment/modelling methods of environmental pollution assessment and distribution; the course is implemented as a study of practical problem solutions;
- during the course **“Sustainability and innovations”** (VidZ5220), students learn the significance of innovation in sustainable development, including its importance in ensuring societal and urban change. These questions are illustrated with examples from the fields of industry, household, agriculture and energy. In this course, students gain a conceptual understanding of sustainable and responsible innovations, including the practical challenges and implementation possibilities of innovation management;
- in the last, 4^{th} semester, study time is devoted to the development of the master’s thesis.

While taking the courses of mandatory part A, students can deepen their knowledge and demonstrate an understanding of the most important modern environmental science areas, fields and the concepts, theories and corresponding methodologies of selected related sub-sectors, then taking the courses of restricted elective part B allows to demonstrate in-depth knowledge in one of the sub-fields of environmental science.

The structure of the study courses outlines specializations in the field of environmental management, environmental assessment and technology. Study courses dominated by aspects of environmental management are as follows:

- Water resources and their management (VidZ5084, 4 CP / 6 ECTS);
- Climate change management: approaches and tools (VidZ5226);
- Environmental communication (VidZ6022, 2 CP / 3 ECTS);
- Sustainable waste management in the context of circular economy (VidZ5225);
- Environmental management systems (VidZ5151).

Students with interests more related to environmental assessment and technologies can choose the

following study courses:

- ArcGIS Pro, cartography and spatial representations (Geog5101);
- Biotechnology and environmentally friendly technologies (VidZ5062), the course is taught in English;
- Eco-design (VidZ6045), the course is taught in English;
- The Baltic Sea environmental protection tools (VidZ5043);
- Fundamentals of risk analysis (VidZ5048);
- Water supply and wastewater treatment (VidZ6057);
- Environmental protection in agriculture and forestry (VidZ5228).

Theoretical and practical solutions related to project idea development, management and evaluation, including international scale, which meets the requirements of the modern market, are discussed in the courses “Development and implementation of environmental projects” (VidZ5227) and “European environmental policy: theory and practice” (VidZ5064, taught in English). For acquiring practical skills, it is possible for students to gain knowledge and skills based on the working environment during the study course “Applied studies in environmental science” (VidZ5067), where a tripartite contract is concluded between the employer, the UL FGES and the student on the implementation of applied studies as part of the study course.

In the free elective part C of the programme, which constitutes of 4 CP / 6 ECTS, students are free to choose any study course.

In general, the study courses included in the study programme and their teaching methodology are aimed at acquiring in-depth knowledge in various sub-fields of environmental science, as well as creating synergy with knowledge in other fields of science (e.g., geography, geology), because nowadays the labour market requires specialists who use and know to integrate fields into a single whole.

For students who have obtained a bachelor’s degree at another university, or need to renew and improve their knowledge in the field of the environment, as well as according to Cabinet of Ministers Regulations No 716 of 05.12.2017 (Minimum requirements for the content of the mandatory civil defence course and the content of the civil defence training for employees) must acquire civil defence in the volume of 1 CP / 1.5 ECTS in the study course “Environmental and civil defence” (VidZ5085).

The reflection of the study courses’ results in the descriptions of the courses confirms that all the knowledge, skills and competencies determined by the study programme are achieved during the study courses. The information about the compliance of the results of all study courses included in the study programme with the outcomes of the study programme can be found in the course mapping attached in the Annex.

Study courses are regularly updated, taking into account the recommendations of specialists of the field, employers, graduates and students, and their content meets the requirements of the geography-related labour market, which are set for jobs in state institutions, private sector, as well as in research activities. The restricted elective course “Applied studies in environmental science” is very popular among students and is chosen by practically all students. Within the framework of this study course, students can, in cooperation with employers, acquire practical skills, improve knowledge and competencies that can be learned in the working environment.

Every year, in order to introduce students to examples of good practice in environmental and nature protection, within the framework of the regional field studies course, students attend enterprises of the field in Latvia and Lithuania.

The results of students', employers' and graduates' surveys are used to improve the quality of studies.

To ensure the quality of the learning process, as well as for clarifying the needs of students, the UL Studies' Academic Department centrally organizes regular surveys of students and graduates, in which the opinions of students are gathered and proposals are expressed both for individual study courses and the programme as a whole. Students' surveys (electronically) take place twice a year (after the autumn and spring semesters), but students can express their opinion much more often during the study process, addressing an issue orally or in writing to the teaching staff, the director of the study programme, the head of the department and the faculty dean.

Students' surveys

The results of students' surveys of the academic master's study programme "Environmental Science" about the study environment, study process, study outcomes, as well as about the programme as a whole have been collected from 2016 to 2022 (for 6 years).

Regarding the study environment, the rating of the respondents varies from 5.8 to 6.3 (corresponds to the rating "mostly agree"). Higher rated are following points: "Responsive filing clerks and methodologists" (6.3-6.7), "Material and technical provision appropriate for studies (premises, computer and internet access)" (6.2-6.4), "Knowledgeable and well-disposed teaching staff" are rated higher (6.2-6.6), "The databases needed for studies were available" (6.2-6.3) and "It was important for the teaching staff that students acquire the course" (6.4). At lowest systematically is rated "Support from the student council and self-government" (4.0-5.5). At the same time, the Students' Self-Government informs that it is difficult for master's students to be involved in any activities organized by the Students' Self-Government, due to the workload. It is reflected also in the students' answers; every year students answer that it is very difficult to combine studies with work.

The responsiveness and hospitality of university lecturers and studies' filing clerks are also emphasized in the comments, as well as the accessibility of modernly equipped auditoriums, computers and library resources.

The assessment of the study process falls into the categories "rather agree" to "mostly agree" (4.5-5.7). The lowest rating in all years was obtained in the point "The opportunities for international experience in studies offered by the UL were sufficient" (4.8±2.5 to 5.6±1.6). It should be noted that large standard deviations appear, indicating a different opinion among students. The same is reflected in the comments, which indicate both the wide opportunities for Erasmus+ studies and the lack of information about them. Higher ratings in this category are addressed to the point, "I had the opportunity to express an evaluation of the study courses" (6.1±1.0 to 6.4±0.9) and "I had the opportunity to express an evaluation of the lecturers" (6.1±0.4 to 6.4±0.6), which provided students with the opportunity to participate in the improvement of the study process.

Evaluating the study environment, offer and technical facilities, in the comments of the survey of 2022, students indicate several strengths:

- understanding in the analysis of scientific research, theoretical knowledge in environmental processes, pollution, ecology, analysis of planning and other documents, understanding and application, practical and independent tasks, versatile information about environmental planning and pollution is obtained;
- versatile course offers, modern studies, latest information, data, research, projects are provided;
- acquisition of practical work skills during the course of applied studies.

Critical comments in recent years (2021, 2022) mention several contradictory recommendations, indicating that the course offer needs to be narrower and recommended to supplement it with courses specific to the field (for example, environmental law). On the part of students who have obtained a bachelor's degree in this programme, it is recommended to review and avoid overlapping specific topics. The students' suggestion has been taken into account, the course topics have been revised, and the overlapping of some issues have been eliminated.

During the reporting period 2017-2022, the fastest increase in the rating level can be observed in the use of the e-moodle study environment (Moodle), from 5.2 (category "rather agree") to 6.6 (category "completely agree"). In connection with the acquired knowledge, the following positions are rated higher:

- “During my studies, I gained good theoretical knowledge in the chosen field of studies” (from 5.6±0.5 to 6.1±0.3), and year by year this trend is increasing a few tenths;
- “Study courses were interesting and useful” (from 5.0±0.7 to 6.0±0.3);
- “During my studies, I improved my ability to find creative solutions to problems of various complexity” (from 5.2±0.7 to 6.0±0.7),

and, it should be noted that a positive development trend can be assessed and the fastest increase can be observed in the statement about preparation for labour market requirements, from 4.5±0.9 (corresponding to the rating “neutral”) up to 6.0±1.2 (corresponding to the rating “mostly agree”). The comments indicate that students appreciate the possibility of applied studies, some of the students continue to work in these enterprises in order to familiarize themselves with the requirements of the labour market, and are also interested in a larger proportion of visiting lecturers in study courses.

The results of the academic year’s 2021 survey reveal that the majority of students (79%) are satisfied with the choice of study programme, and 86% of the respondents would recommend this study programme to others. The following acquired skills are highly valued:

- written language skills,
- the ability to refer (present) information publicly,
- the ability to discuss and justify own opinion publicly,
- skills to work in a team,
- acquired terminology of the field in a foreign language,
- ability to work with field-specific computer programmes.

Already in 2022, the students’ assessment has significantly increased, and 93% of students are satisfied with the study programme; the assessment of knowledge, skills and competencies has also increased. The ratings reveal currently important areas that ensure competitiveness, for example:

- research competence (critical and analytical thinking, conceptualization of knowledge, creation of added value and social innovations) – high rating by 94% of respondents;
- entrepreneurship competence (planning, responsibility, problem solving, ability to reorient) – high rating by 63% of respondents;
- innovative competence (initiative, creativity, generation of ideas, strategic thinking, alternative / original thinking) – high rating by 75% of respondents;
- global competence (awareness of diversity, understanding of values and attitudes in an intercultural environment, understanding of sustainability) – high rating by 88% of respondents;
- professional competence (the set of knowledge, skills and responsibilities necessary to perform a professional activity in a given work situation) – high rating by 81% of the

respondents.

Every semester, the results of the students' survey filled out at the UL Information System (LUIS) are discussed at the meetings of the Environmental Science Study Programme Council. Student proposals aimed at improving the master's study programme "Environmental science" are evaluated and, as far as possible, implemented in the study programme (for example, the opportunity to participate in intensive international courses is offered if it is not possible to participate in Erasmus+ studies at foreign universities). Information about the implementation of study courses and possible problems was regularly discussed with students during the semester, and students are invited to solve the arising questions or problem situations in a timely manner, using the support of university lecturers, filing clerks and study methodologists. For example, if during the study process difficulties in combining the study process with work arise, university lecturers and students agree on an optimal acquiring of the studies using the elements of individual course learning.

In addition, since 2021, the current issues of the study process are discussed once a semester with the Students' Self-Government, in which the faculty management, directors of study programmes, heads of the faculty's study areas and representatives of the Students' Self-Government participate. At these meetings, all those involved in the process are introduced to the students' thoughts on the progress of the learning process based on the results of the survey they have conducted. Mainly, the issues discussed are addressed to the bachelor's level studies, because bachelor's students have more questions there.

Regarding students' motivation and support measures, scholarships are available to students, as well as the opportunity to apply for patronage scholarships, in accordance with the procedures specified in the UL regulations. All students have the opportunity to use the help of a psychologist. Issues related to studies are resolved in cooperation with the director of the study programme, the dean of the UL FGES, as well as the teaching staff of specific study courses.

Graduates

The survey of graduates of the master's study programme "Environmental science" was conducted in January-February 2022. It was anonymous and was created on the Google Forms platform. Graduates of the master's programme, graduated from the UL FGES in the period from 2016 to 2021 were invited to participate in the survey, the results of the graduates' survey of 2022 were used in the additional analysis, when the survey was conducted just after graduating from the programme. In total, answers from 33 graduates were used in compiling the results of the survey.

The analysis of the results of the conducted survey revealed that 88% of the respondents have worked for at least 3 months in the industry related to the study programme; it is characteristic that all graduates (100%) of the last year (2022) are working in the corresponding field, and 69% of them have a full-time job. In a survey conducted in the winter of 2023, two respondents stated that, although they are satisfied with their studies and results, they do not work in the field because they are dissatisfied with the salary. In this survey, the knowledge and skills provided in the study programme were highly valued (63%), the improved ability to think critically – the ability to evaluate, analyse, systematize information (69%), the improved ability to make decisions based on previously performed information analysis (69%). Similar, and higher, results were obtained by analyzing the answers of the graduates of the last year (2022), in addition to the high assessment of knowledge, skills and abilities, all respondents (100%) noted that they had acquired the skills to learn and study during their studies. 80% of the respondents answered that the knowledge and skills gained in the studies are also used at work, and 1/5 of the respondents are considering continuing their studies for a doctoral degree.

Graduates also have pointed out the shortcomings that, in their opinion, should be eliminated or implemented:

- increase the use of the English language (study courses), the learning of the terminology of the field in both Latvian and English;
- include practical activities related to filling out documentation, understanding and interpreting regulatory acts;
- motivate students more to get involved in Erasmus+ programme activities;
- offer more study courses related to data analysis, use of technology, and solving various problem situations based on the work environment;
- offer more lectures by foreign visiting lecturers.

For elimination of the shortcomings indicated by the graduates, as well as to implement the recommendations, several study courses are offered to students in English (Ecodesign; Biotechnology and environmentally friendly technologies; European environmental policy: theory and practice; Interaction of human and environment in theory and practice); the recommendation to explain the terminology of the field in both Latvian and English is discussed with the university lecturers of all courses. Changes have also been made in the conducting of study courses, in forms that allow students to solve problems based on the working environment, for example, in the study course “Field studies and research methods in environmental science”, students attend field-related enterprises in Latvia and Lithuania during the study visits, learn the data acquisition process, data quality control methods and working with large data sets. Students are informed about Erasmus+ opportunities 2 times a semester, information is provided both by the programme director (at the beginning of studies), and an informational seminar is organized centrally at the UL in January of each year. Although the interest in Erasmus+ studies is high, the students admit they do not use this opportunity because they do not want to leave their paid work. But as an alternative, students are offered Erasmus+ practice (short-term mobility), which two students have already used in recent years.

Every year, and if necessary more often (on the university lecturer’s initiative), all study courses are updated, reviewing the content of the courses and the topics included, renewing the list of literature sources and evaluating the compliance of the results of the study courses with the requirements of the master’s study programme in environmental science. In general, graduates highly appreciate the acquired skill of applying the theoretical knowledge of their field in practical activity, the skill of creatively solving problems of various complexity, the acquired skill of critical thinking (the skill of evaluating, analyzing, and systematizing information), as well as the acquired skill of analyzing a large amount of information. As a result of graduate surveys, it can be seen that the majority of master’s students work both in a permanent job and in various projects, sometimes a break is possible when the projects end.

Employers

In general, the employers’ assessment of the qualifications of the graduates of the programme is high; highly appreciated is the graduates’ theoretical and practical readiness, as well as their ability to acquire new knowledge and skills and their ability to work independently. At the same time, employers point to improvement opportunities. The assessment and recommendations of employers are summarized in **Table 3.2.1.1**.

Table 3.2.1.1.

Employers’ reviews and recommendations about the study programme

Employer	Cooperation, recommendations in a summarized form
State institutions	
Ministry of Environmental Protection and Regional Development	1. To strengthen cooperation for the implementation of applied studies. 2. To expand the exchange of information about vacancies. 3. To include in the study programme document analysis skills and record-keeping skills. 4. To supplement the study programme with courses in which mathematics, physics, and processing large data sets are acquired in depth.
Council of Riga	
Latvian Environment, Geology and Meteorology Centre	
State Environmental Service	
SJSC "Latvijas dzelzceļš" ("Latvian Railway")	
Latvian National Armed Forces	
State Office of Environmental Supervision	
Scientific institutions	
Hydroecology Institute (Daugavpils University)	1. To expand the learning of data mining and processing methodologies. 2. To offer studies on the standardization of laboratory processes.
State Forests Research Institute "Silava"	
The UL Institute of Biology	
Institute of Food Safety, Animal Health and Environment "BIOR"	
Business enterprises	
"Ameco Vide" Ltd	1. To expand cooperation opportunities for implementing applied studies in enterprises. 2. Improve students' presentation, argumentation and discussion skills and teamwork. 3. To include more work with an understanding of legal documents. 4. GIS skills are exceptionally highly valued, and the acquisition of practical skills with various GIS software should be increased.
"ELLE" Ltd	
"Enviroprojekts" Ltd	
UPB group	

Students use the possibilities of incoming and outgoing mobility, what they have acquired during mobility is recognized

In the reporting period from 2016/2017 until 2021/2022 for the autumn semester, the number of master's students studying at foreign universities in Erasmus+ programmes has been relatively low. In total, about 15 students out of all students have used this opportunity. Regarding foreign universities, it cannot be mentioned the dominant one – students chose to study at Albert Ludwig University of Freiburg (Germany), University of Eastern Finland (Finland), University of Huelva (Spain), University of Alcala (Spain). In recent years, 4-5 students typically choose Erasmus+ studies or internships. Unfortunately, in the academic year 2019/2020, out of five students who wanted to study abroad, only one student could do that as travelling was affected by the COVID-19 pandemic. The incoming mobility of students during the reporting period varies from 1 to 5 students per year, of course, there has been caution in mobility in recent years, both due to the COVID-19 pandemic, as well as since February 2022 (due to the war in Ukraine) in Southern Europe, it is not even offered or recommended for students to go to Northern Europe and Eastern Europe. Overall, COVID-19 pandemic has a huge negative impact on mobility.

Living conditions that do not allow combining Erasmus+ studies with full-time work and the relatively short duration of studies (4 semesters) can be mentioned as important factors hindering mobility. To support and encourage students' involvement in mobility, credit points obtained (for example, in the Erasmus+ exchange programme, in summer schools, or in other types of intensive international courses) are counted into free elective part B, if they correspond to the content of the programme and are agreed with the director of the programme. Also, to promote participation in mobility programmes, closer cooperation with employers is established, explaining to employers and students the benefits of using the mobility programme in improving students' knowledge, skills and competencies.

At the same time, the students of the master's study programme "Environmental science" have used the opportunity to participate in the international cooperation project Interreg Central Baltic Crea-RE (*Creating aligned studies in Resource Efficiency*), which took place from 01.03.2018. to 30.11.2020, where practical classes were held in several study locations:

- 30.09.2018-05.10.2018, in Riga (Latvia);
- 04.03.2019-08.03.2019, in Gävle (Sweden);
- 30.09.2019-04.10.2019, in Lahti (Finland);
- 17.02.2020-21.02.2020, in Saint Petersburg (Russia).

In addition, students also attended summer and winter schools, for example, the winter school course "*Analysis of Climate Variability*" at the University of Rostock in 2021.

For more active involvement in mobility programmes, it is necessary to cooperate more closely with employers, explaining to employers and students the benefits of using the mobility program in improving students' knowledge, skills and competencies.

The university lecturers of the study courses are actively involved in research, evidenced by their academic and scientific qualifications and the list of publications. It provides the basis for integrating the latest scientific achievements into the content of courses. Courses' content and descriptions are updated yearly according to the latest scientific achievements.

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

The awarding of the master's of science degree in environmental science is based on the achievements and knowledge of the fields of Earth science, physical geography and environmental science, which are acquired in the study courses of the programme. The problem issues of sub-fields and inter-sectors are emphasized (Environmental chemistry and ecotoxicology; Nature protection; Environmental management; Applied environmental science) to promote acquiring the theoretical background and methodology of solving problem-situations, thus developing the skills of research work and promoting the strengthening of the practical skills necessary in the labour market.

University lecturers with doctoral degrees in geography, biology or chemistry principally participate in realising the study programme. Several doctoral students with master's degree in geography and biology are involved in the realization of the topics of the study programme during the courses "ArcGIS Pro, cartography and spatial representations" and "Biotechnology and environmentally friendly technologies". The involvement of doctoral students in the teaching of study courses is evaluated positively from the point of view of accumulating academic experience and, in many cases, also from the reflection of a new methodology or theory, which has been used in their doctoral theses. University lecturers mainly carry out research in one of the sub-fields of environmental science, interdisciplinary research is also carried out.

The obtained scientific degrees and research areas confirm the ability of university lecturers to provide students with study courses based on the latest achievements and findings of the scientific field, as well as the fact that the awarded master of science degree in is based on the achievements of the relevant scientific field.

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Oral, written and combined study and evaluation methods are applied during study courses and examinations.

Various methods of acquiring and strengthening knowledge are applied during the studies, such as introductory, interactive, summary, and problem-oriented lectures. Practitioners, professionals from various institutions are invited as tutors of individual lectures in study courses, in order to promote the unity of theory and practice (for example, in the study course "ArcGIS Pro, cartography and spatial representations" – Dāvis Immurs is invited from "Publishing House of Maps *Jāņas sēta*" Ltd, in the study course "Biotechnology and environmentally friendly technologies" – Evita Goša from "Schwenk" Ltd, in the course "Basics of risk analysis" – Kristīne Gāga from "Rail Baltica"). Practical tasks, seminars, individual, pair and group work, discussions and project development, study tours to industry organizations are widely exploited. Employers are involved in the implementation and improvement of study courses (they are invited to conduct individual seminar classes; often the

classes are organized as experience exchange visits to workplaces, etc., for example, as part of the course “Basics of risk analysis”, students are visiting the Baldone Radioactive Waste Landfill, etc.).

In order to promote the development of students’ research competence, students in subsequent courses have the opportunity to analyse and in-depth research of problems in the field that interest them (for example, in the study courses “Landscape ecology: theory and practice”, “Sustainable waste management in the context of the circular economy”). Last year students are involved in managing the study process for first year’s students (peer teaching-learning).

During study courses, speaking, presenting and discussion skills of students are promoted in seminars.

For students to achieve their study results – acquire and strengthen knowledge, skills and develop competence – the study process is dominated by methods in which students’ own activity is important. In the study process, the methods are used that promote student communication in the performance of study tasks, solving real problems in the field, modelling situations (for example, in the study courses “Modelling of nature and environmental processes”, “Field studies and research methods in environmental science”, “Environmental management systems”).

The physical environment of the studies is also gradually changing: the auditoriums can be easily transformed for group work, individual work, students can use digital technologies. University teachers mostly use methods that encourage students for active participation, critical thinking and reflection. The e-study environment will be used in the study process and to promote independent studies. An e-study environment (Moodle) has been created for each study course, where students have access to study materials, task descriptions, in addition to study materials related to course topics, as well as study tasks to be completed (tests, forums, seminars, conferences, etc.). All study course midterm and final examination evaluations with grade justification are recorded and available to students in the e-study environment.

In implementing the study programme, an individual approach to each student, which manifests itself in several aspects, is of fundamental importance. First of all, students have the opportunity to individually consult with each teaching staff member at certain consultation times, as well as at other times by mutual agreement. Secondly, cooperation with students and teachers is also ensured by the possibilities of using the e-study environment. It is the responsibility of the teaching staff to regularly check their received electronic mails and respond to them; some university lecturers also actively use various social networks (Facebook, Twitter, Instagram) to communicate with students. Thirdly, students are provided with free access to the faculty’s general staff, study methodologists and management.

The student-centred approach is followed when updating the study programmes and their courses, paying particular attention to the meaningful formulation of the study outcomes, thus promoting the dialogue between university lecturers and students about the study content, organizational forms and methods. On the other hand, correctly formulated study outcomes encourage students’ understanding and co-responsibility for their learning, self-evaluation and understanding of the received evaluation. During the study process, the university lecturers apply the methods, test forms and assessment criteria appropriate to the purpose of the studies and the planned study results.

During the study process, students receive support and feedback from university lecturers. The evaluation criteria for the posting of grades have been published in advance. Assessment allows students to demonstrate to what extent they have achieved the expected learning outcomes.

By observing the study principles of student-centred education, student mobility is promoted (for example, participation in Erasmus+ internships, summer schools, etc.). The most frequently

expressed interest of students to participate in the mentioned activities is related to the development of research work, acquiring new methodologies. The credits obtained in this way are counted in part B, the free elective part. Students are involved in research initiated by academic staff (for example, in fundamental and applied research projects funded by the Latvian Council of Science – Rūta Ozola-Davidāne involved Aiga Salmiņa in the project "*Unused Latvia's natural mineral resources for the development of innovative composite materials for phosphorus recovery from small municipal and industrial wastewater treatment plants to implement the principles of circular economy (CircleP)*", etc.) and in social activities in society, thus gaining significant experience by using in practice what was acquired in studies. By implementing the internal quality assurance policy, study programmes are implemented in such a way that students are encouraged to actively participate in the improvement of the study process. Rules and procedures for submitting student proposals and resolving complaints exist for considering student appeals. The programme director informs Students about these procedures while starting their studies. The results of student surveys are evaluated and taken into account in the improvement of the study process. Students are willingly expressing their suggestions for the improvement of study programmes and processes in discussions with university lecturers and programmes' directors.

Students' independent or individual work is significant during the studies; the scope, content and type of control depends on the specific study course. Students' independent work is organized individually (preparing for classes, preparing homework) and in small groups (seminar classes, group work, homework, presentations). Students must independently learn the mandatory literature specified in the course description, as well as follow and read the latest publications and articles related to the course topics, work with the e-study environment, Internet resources and other study materials, reports or projects, presentations, etc. must be prepared. Thus, students acquire theoretical knowledge in lectures and independently, studying and analyzing scientific literature, completing tasks assigned by the teaching staff, etc. activities provided in the course description. In addition, during their studies, master's students can participate in the activity of the doctoral school "Land resources and their sustainable use", which gives the opportunity to participate in seminars and guest lectures on various topics.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

The master's thesis must be developed in accordance with the UL regulations "Requirements for the elaboration and defence of final theses (bachelor's, master's theses, diploma theses and qualification theses)" (the UL Order No 1/38, 03.02.2012) and in accordance with the regulations of the UL FGES "On the elaboration and defence of final theses in geography, geology, spatial planning and teachers' professional study programmes" (https://www.geo.lu.lv/en/studies/study-process/final-theses/development-and-defence-of-final-thesis/; approved on March 19, 2018 by the UL FGES Council meeting). The master's thesis is evaluated by the master's final examination commission, taking into account the recommendation included in the reviewer's reference.

The selection of topics for master's theses is done individually, in consultation with the teaching staff of the faculty. Initially, the master's topics, in connection with the choice of research methods, take place during the 2nd semester in the study course "Master's thesis – project", where students justify the topicality of the issue in their study work, prepare a review of scientific literature, describe the choice of the most suitable data collection and analysis method for performing research tasks, depending on the topic's specifics. The selection of the master's topic before the summer season is essential due to the specificity of conducting fieldwork to collect empirical data. After the elaboration of this work, a presentation of the work takes place before the summer, where, if necessary, the title of the topic is clarified and recommendations, instructions for further elaboration of the topic are received. The procedure for submission and defence of the master's thesis is described in the above-mentioned regulations of the UL and the UL FGES.

The master's thesis must meet the basic requirements of the scientific work:

- a scientific research must be implemented in one of the subfields of environmental science;
- the result should be based on the data obtained from field studies, on the relevant literature, other sources of information and the materials of the personally conducted research;
- the course of the research should be logical, consecutive, the result generalizable and unambiguous;
- uniform terminology and standard abbreviations must be used throughout the master's thesis;
- the master's thesis must be written in such a way that the opinions of the author of this thesis can be easily distinguished from the opinions of other authors;
- the presentation of the content must be precise, clear, logical, concrete;
- the master's thesis must be written in the correct literary state language.

During the reporting period (2016-2022), graduates of the programme have elaborated a total of 130 master's theses in various thematic branches of environmental science.

The topics of final theses in the field of applied research, where modern research technologies are integrated and at the same time their development and use in various directions of research in the environmental sector, are gaining relevance among master's students. Examples of completed theses are as follows:

- Clay mineral composite materials for controlled sorption and release of polyphenols in skin protection products;
- Micro- and mesoplastic pollution in the coastal beach area in Latvia of the Baltic Sea and the

Gulf of Riga;
- Actuality of textile recycling in Latvia and prospective methods for its use;
- Rain flood modelling and impact assessment in the pilot territory of the city of Liepāja;
- The potential of using artificial intelligence methods in the processing and interpretation of atmospheric pollution data.

The topicality of **natural resources research** in the choice of the topic of the final thesis is determined by the interest in the possibilities of sustainable use of resources and still unrealized potential of resource use. It is typical that students expand the concept of resources in their final theses, stating that waste is also a resource. Examples of developed final theses are as follows:

- Cloudberries (*Rubus chamaemorus*) in the wild and the possibilities of their propagation and cultivation for the recultivation of developed peat bogs in Latvia;
- Management of food surpluses in mixed assortment food stores: approaches and solutions;
- Herbicidal and fungicidal effects of *Solidago canadensis* and *Heracleum sosnowskyi* essential oils;
- Use of rattles (*Rhinanthus*) in the ecological restoration of grasslands in fertile soils: importance of seed quality and competition;
- Evaluation of the biostimulating activity of humic substances using germination tests.

The topic of the causes and spread of **environmental pollution** problems is investigated in students' works based on actual problems in pilot territories, in cooperation with employers or scientific-research institutions. Examples of elaborated final theses are as follows:

- Environmental risk assessment of chemical substance leaks in hydroelectric power stations Pļaviņas, Ķegums and Rīga;
- Characterization of the composition and spatial distribution of microplastics in the surface layer of sea waters of Latvia – in the East Gotland Basin and the Gulf of Riga;
- Assessment of railway noise in Riga, in the vicinity of Krievu Island: instrumental measurements and modelling;
- Assessment of mercury contamination in black storks (*Ciconia nigra*) in Latvia.

Long-term ecological research topics are often developed to assess changes in various types and levels of systems, identification of influencing factors, and, if possible, future development trends. Examples of elaborated final theses are as follows:

- The spread of fire blight *Erwinia amylovora* in Latvia and the impact of long-term meteorological conditions;
- Benthic biological diversity of the hard bottoms in the eastern coast of the Gulf of Riga as an indicator of the ecological state;
- The influence of recreational load on the distribution of primary dunes in Mangaļi.

The topic of **environmental management** appears in the final works simultaneously linking several fields of sustainable development – environmental, social and economic. In their works, students often deal with the management of individual protected objects or municipalities. Examples of elaborated final theses are as follows:

- Development of coastal management in Talsi region: public monitoring;
- The role of local communities in sustainable environmental management: the smart village approach;
- Possible driving forces for the acceptance and socially inclusive use of wind parks in Latvia;
- Legal aspects of domestic wastewater management in decentralized sewage systems in Latvia.

Several times, students have elaborated their final theses in order to describe the interaction of the development of anthropogenic and natural processes, searching for successful solutions for coexistence. Examples of elaborated final theses are as follows:

- Discourses of natural values in the Gauja National Park;
- Determinants of environmentally friendly behaviour in the perspective of Lithuanian tourists visiting the Pape Nature Park.

In general, it can be concluded that the topics of the final – master's – thesis comply with the title and content of the study programme, and the results of the research conducted by the students are relevant in the field of environmental science. The results of research and projects presented in thesis confirm the in-depth skills of the degree applicants to independently obtain, summarize and interpret the results obtained in the work, which allows conducting research activities and developing a research project at a high professional level. The topics and quality of the master's theses defended indicate the achievement of the study outcomes. The grading of master's theses (Fig. 3.2.6.1) reveals that students are able to demonstrate high-level knowledge, skills and competence, in accordance with the requirements set for the master's thesis.

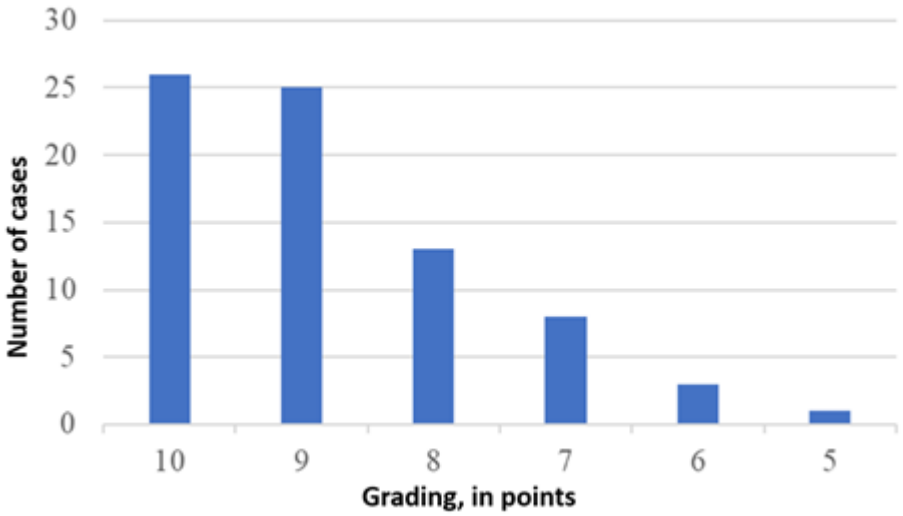


Fig. 3.2.6.1. *Grading of master's theses in the period from 2016 to 2022*

It can be observed that the grading of master's theses is high, which can be explained by motivating students to start research work as soon as possible; already in the 2nd semester, students prepare a summary of theoretical knowledge and develop a part of the methodology and publicly defend the project of the master's thesis (in the study course "Master's thesis – project"). In cooperation with the programme director (in regular meetings), the progress of master's thesis development is discussed throughout the rest of the study period. A significant influence on the grading of the final thesis is the students' assessment of scientific activities such as conferences and projects. Students actively use this opportunity, thus, the topics of the master's theses are discussed at these conferences, and the results are already approved both in Latvia and internationally.

In general, in the survey about the final thesis elaboration process, evaluating the cooperation with the supervisor, the work elaboration and evaluation process, and the self-assessment of skills, the highest rating was achieved in 2022, it reached 7.0 points, which corresponds to the maximum rating. All positions were rated equally high; the rating was also high in previous years, varying from 6.12 to 6.90. The students did not add any comments when giving the evaluations, but the results reveal that the acquired skills are evaluated most critically.

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

The master's study programme "Environmental science" is fully provided with the information base for acquiring study courses and developing a master's thesis, which is determined by the location of the UL Natural Sciences Library in the UL House of Nature premises, the location of the library in the adjacent UL House of Science, as well as the access to a wide range of publications' databases offered by the University of Latvia: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/. For all courses of the study programme, an e-study environment has been created in Moodle, where study materials are placed, current events are reported among students and university lecturers, mid-term tests and examinations are provided for some courses, and mid-term grades are entered and the final grade of the course is calculated. The UL Academic Centre allows students to study in modern premises equipped with interactive whiteboards and acquire practical skills in spacious, well-equipped laboratories.

Provision of resources of the study programme and its compliance with the implementation of the programme in a given direction is provided in Subchapters 2.3.1- 2.3.3 of Part II, Chapter 3. In addition to the information provided in Chapter 3, the given sub-chapter provides more detailed information about the collection of spatial data in the UL FGES Map Browser. From year to year, the collection of spatial data in the UL FGES Map Browser is being expanded. It includes topographic maps, thematic maps, collections of orthophoto maps of the 6th cycle with the coverage of the territory of Latvia and a relief model of Latvia, which involves all the basic data in its structure. The incomplete topographic map M 1:10,000 of the Latvian Geospatial Information Agency is available in the Map Browser. A LiDAR data model is available for about 60% of the territory of the Republic of Latvia, where it is possible to measure the heights of the earth's surface (relief) and create profiles (oriented to research). Exceptionally in Latvia, in the UL FGES Map Browser is available Agricultural Lands of Latvia (Cadastre) – soil maps and land valuation maps. The vector data of the mentioned agricultural lands prepared within the framework of the UL FGES project can be found in e-Latvia resources and are available to everyone. In the academic year 2020/2021, the Map Browser was supplemented with new layers, the maps of the Riga city of 1883 (M 1:2,100) were obtained, also the map of Western Russia M 1:100,000 – 1, of 1915-1920, including Vidzeme, maps from the time before the First World War and the collective farms of the USSR and maps of Soviet farms were obtained. The Map Browser is available to users registered in the UL network.

Students can elaborate their research works in the following laboratories:

- Soil physical research laboratory,
- Soil and sediments chemical research laboratory,
- Natural resources research laboratory,
- Natural and environmental process modelling laboratory,
- Forest and water research centre laboratory of national significance,
- Environmental quality monitoring laboratory,

- Environmental technology laboratory.

In addition, students also have access to various portable or semi-mobile devices for performing measurements in the environment:

- DT-9880 – solid particle counter for determining atmospheric pollution;
- Libelium Plug & Sense – a sensor device for measuring odour pollution and solid particle pollution in the atmosphere;
- thermal cameras HT-02D for taking thermal images and evaluating surface temperature projective coverage;
- temperature and relative humidity data loggers – PCE-HT71N;
- vibration measuring device PCE-VD3;
- electromagnetic radiation measuring devices E0546; PCE-EM29;
- noise level measuring device PCE-322A;
- UV light level measuring device PCE UV34;
- GRIMM-365 – solid particle pollution level measuring device in the atmosphere in autonomous mode;
- Horiba APNA-370 – nitrogen oxide pollution measuring device in autonomous mode;
- Horiba APOA_370 – ozone pollution measuring device in the atmosphere in autonomous mode;
- light pollution measuring device SO200K;
- multimeter for measuring light and noise pollution and assessing microclimate quality – PCE-EM882.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

Revenue of the programme

To provide the financial funds necessary for implementing the study programme “Environmental science”, the UL exploits state public funding from the Ministry of Education and Science and study fees. The overview of the distribution of students by type of studies and annual income is summarized in **Table 3.3.3.1**.

Table 3.3.3.1.

Number (No) of students in the programme and annual income (data of 2022/2023)

Type of study	LV state funded	LV for tuition fee	EU/EEA/Swiss citizens* for tuition fee	Others** for tuition fee	Total	State subsidy	For tuition fee LV and EU/EEA/Swiss citizens	Fee for citizens of other countries	Annual income
	No	**No**	**No**	**No**	**No**	**EUR**	**EUR**	**EUR**	**EUR**
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*1*6+(2+3)*7+4*8*
FTS (in Latvian)	50	-	-	-	50	4,646	2,600	-	232,291
FTS (in English)	-	-	-	-	-	-	-	-	0
Total	**-**	**-**	**-**	**-**	**50**	**-**	**-**	**-**	**232,291**

* EU/EEA/Swiss citizens – European Union / European Economic Area / Swiss Confederation.

** Others – outside of EU/EEA/Swiss Confederation.

Programme costs

To estimate the amount of funds required for financial security, the prime cost price of the UL study programmes is calculated according to the methodology developed by the UL, which takes into account the costs of ensuring the study process described in the section “Financial support for study direction” and information about the plan of the study programme, the participating teaching staff, the planned number of students, etc., thus ensuring the reliability of forecasts.

Programme costs for the **full-time regular studies in Latvian (FTS)**

For calculations, the implementers of the study programme “Environmental science” of full-time intramural studies use the data of the academic year 2022/2023, i.e., the number of students as of 01.10.2022, the study plan/regulations and the structure of the academic staff involved. Based on these data, the total annual costs of the programme are 232,291 EUR and their structure (percentage distribution) is shown in **Table 3.3.2.2**.

Table 3.3.2.2.

Percentage breakdown of costs in the study programme

Expenditure item	% of total
Teaching staff costs	45.3%
General staff	17.6%
Other payments	-
Infrastructure expenditure	9.1%
Property and services	2%
Indirect costs	26%
TOTAL COSTS	**100%**

In **Figure 3.3.3.1**, the prime cost of the study programme is visually represented with a red line (vertical axis) depending on the number of students (horizontal axis), and the weighted average study fee is indicated (green line).

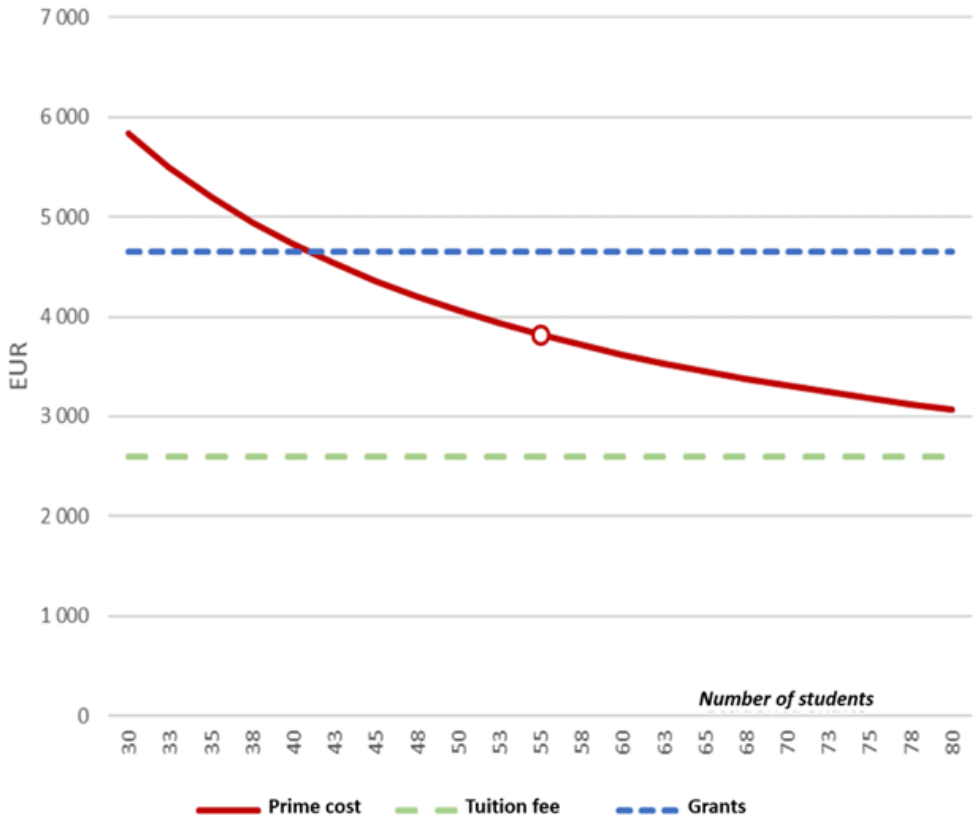


Fig. 4.3.3.1. *Prime cost per number of students of the academic master's study programme "Environmental science"*

Based on the cost structure and the total number of students (50), the cost of the programme per student (prime cost) is calculated 4,646 EUR annually.

For the programme to be profitable, the minimum number of fee-paying students must be at least 85 (extrapolating the red and green lines to reach the intersection) or the number of budget students must be at least 43 (the intersection of the red and blue lines).

Summary of the programme revenues and costs

Table 3.3.3.3 summarizes the predicted number of students, programme revenues, expenses, results and profitability (result versus revenue, %) for all forms of implementation.

Table 3.3.3.3.

The result of the programme

Studiju veids	Total	Annual revenue	Annual expenditure	Result	Profitability
	Number	EUR	EUR	EUR	%

Full-time intramural studies (public funding)	50	232 291	214024	18267	8

The table data clearly proves that the UL has sufficient funds to implement the study programme and ensure its further development. Additionally, the development of the programme can be financed from the income received from lifelong learning and other services, as well as from the financial resources accumulated by the structural unit. Faculties also receive financial support for programme development from the UL Study Quality Improvement Fund. The minimum number of students required for the study programme is not dependent on its implementation in English or Latvian, as the teaching staff and study courses do not differ.

Available study programme resources contribute to the development of the study programme.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

During the academic year 2022/2023, 24 university lecturers from the Department of Environmental Science, Departments of Geography and Geology, including visiting university lecturers, for example, from the University of Klaipeda (Lithuania), have participated in the implementation of the master's study programme; a total of 4 professors, 4 associate professors, 1 visiting professor, 10 assistant professors, 5 visiting university lecturers. It should be noted that several teaching staff members may jointly teach the same course.

Thus, the number of professors and associate professors (13) fully complies with Article 55, Part 1, Clause 3 of the Law on Higher Education Institutions, which states that "not less than five professors and associate professors (counted together), who have been elected to academic positions at the respective university, participate in the implementation of the mandatory part and the restricted elective part of the academic study programmes".

During the reporting period, the academic staff has been involved in important international projects, the Latvian Council of Science financed projects, as well as applied research commissioned by state institutions and commercial companies, the subject of which corresponds to the content of the study programme and thus the obtained results are successfully used to improve the study process (see Chapter 2.4). Scientific publications confirm the performance of the scientific activity of each teaching staff member.

The high qualification of the teaching staff also allows compliance with the regulations of the Cabinet of Ministers No 240 "Regulations Regarding the State Standard for the Academic

Education” (on May 13, 2014, Part III, Clauses 15 and 16):

- The main goal of the master’ s study programme is to provide a set of knowledge, skills and competence in accordance with the level 7 of knowledge, skills and competence in the framework structure determined in the education classification of Latvia.
- The content of the master’s study programme ensures the achievement of study results that include acquiring in-depth theoretical knowledge and developing research skills and abilities in the chosen field of science or art.

The teaching staff's qualification helps achieve the study results of the master’s study programme “Environmental science”, as among them, the most highly qualified teaching staff – professors and associate professors – prevail. In addition, teaching staff are specialized in various subfields of environmental science (environmental chemistry, ecotoxicology, environmental pollution, environmental management, etc.), as well as in other branches of science (geology and geography), which determine the opportunity to provide students with the latest scientific findings and current practical skills in a broad spectrum of natural sciences. It is important that among the leading researchers and university lecturers, several young teaching staff members are involved who can replace professors and associate professors in the future.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

During the reporting period, the qualification of teaching staff has increased significantly and the teaching staff has been supplemented, as indicated in **Table 3.4.2.1**. Several university lecturers have been elected as associate professors, while several young researchers after obtaining a doctoral degree have started working as university lecturers.

Several professionals of the fields also participate in the implementation of the programme, for example, 2 lecturers from the employers are involved in teaching GIS technologies – *Dr. geogr.* Aivars Tērauds from “Envirotech” Ltd and doctoral student Dāvis V. Immurs from “Publishing House of Maps *Jāņas sēta*” Ltd.

Table 3.4.2.1.

Changes in the composition of the teaching staff in 2016/2017 and 2021/2023 in the master’s study programme “Environmental science”

Position / Year	2016/2017	2022/2023
Professors	5	5
Assoc. professors	3	4
Assistant professors	14	10
University lecturers	1	4
University teachers	2	1

In general, it can be concluded that the changes in the number and structure of teaching staff

involved in the programme can be evaluated positively and the education quality is increasing, because the academic staff involved in the programme both qualitatively and quantitatively ensure the achievement of the tasks of the study programme.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

To promote improvement and interconnection of study courses, teaching staff cooperation occurs regularly. It is also facilitated by the fact that, in many cases, several teaching staff members jointly teach one course. At the meetings of the Study Programmes Councils and, since May 2020, at the meetings of the Study Direction Council, proposals for improving the study process are discussed and considered for improving the study process, taking into account the students' assessment of the study course.

The cooperation of the teaching staff is also promoted by the programme management, which, through regular meetings and/or electronic communication with the university lecturers, discusses and coordinates the study process. The issues of the study process are discussed in individual conversations and are periodically considered by the Study Direction Council.

If the students' suggestions are expressed in discussion with the programme director or the head of the department and it concerns the teaching of a specific course, then the university lecturer of this

course is primarily informed and the comments made by the students are evaluated and solutions are sought for the improvement of the study course.

Meetings of the Study Direction Council are convened regularly, where issues related to studies and methodical work (improvement of the content of courses, e-study environment, etc.) are discussed. If one study course is taught by several university lecturers, then one particular person is responsible for updating the content in ULIS, as well as for coordinating the subject matter and time allocations, according to the course description and other current issues.

In the academic year 2022/2023, 24 university lecturers were involved in the implementation of the master's study programme "Environmental science", 23 of them holding doctoral degree, which makes the ratio of the number of students and teaching staff as 2.2, indicating number of students to one teaching staff member.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	28P_Msc_Diploma.docx	28P_VidZ_mag_Diploms_ar_pielikumu.docx
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	29P_MSc_Env sci Student statistics.docx	29P_MSP_Vides_zinatne_Statistika_studejosajiem_parskata_perioda .docx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	30P_MSc_Compliance with HE standarts (ENG).docx	30P_Studiju programmas atbilstiba valsts izglitibas standartam_AkD.docx
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	31P_MSP_mapping.xlsx	31P_MSP_Vides_zinatne_Studiju_kursu_kartejums.xlsx
The curriculum of the study programme (for each type and form of the implementation of the study programme)	32P_MSC-Env_Study_programm_plan.docx	32P_MSP_ Vides zinātne_Studiju_programmas_plans.docx
Descriptions of the study courses/ modules	33P_Kursu-apraksti-MSC-Vide-ENG.docx	33P_Kursu-apraksti-MSC-Vide_LV.docx
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)	J_55.3_pants_ENG.pdf	55.3_pants_Apliecinajums.edoc

Environmental Science (43431)

Study field	*Environmental Protection*
ProcedureStudyProgram.Name	*Environmental Science*
Education classification code	*43431*
Type of the study programme	
Name of the study programme director	*Imants*
Surname of the study programme director	*Kukuļs*
E-mail of the study programme director	*imants.kukuls@lu.lv*
Title of the study programme director	*Dr.geogr.*
Phone of the study programme director	
Goal of the study programme	*To provide students with basic academic and professional knowledge in environmental science as an interdisciplinary science, including acquiring the theoretical and methodological background of environmental science and related fields of science, at the same time, providing students independently solving current theoretical and practical problems in environmental science, ensuring the application of this knowledge in research and practice.*
Tasks of the study programme	*1) To increase knowledge, skills and acquirement in natural sciences (physics, chemistry, biology and Earth sciences);* *2) To improve knowledge about the spheres of the natural environment and their mutual interaction – biosphere, lithosphere, hydrosphere and pedosphere;* *3) To create an understanding of the development processes of society and their impact on the environment;* *4) To provide knowledge about the most important political, legal, economic and technological solutions to prevent or reduce society's impact on the environment and ensure the improvement of environmental quality;* *5) To ensure the application of theoretical knowledge in practice – in the form of practical work, applied study courses, laboratory work and field courses, thereby promoting the improvement of students' skills and acquirement;* *6) To develop for students, on the one hand, self-sufficiency, and on the other hand, skills and ability to work in a group;* *7) To develop students' research skills, which are manifested in the elaboration of a bachelor's project and a bachelor's thesis.*

Results of the study programme	*KNOWLEDGE:* *1. Demonstrates basic knowledge in environmental science and related fields, understands the most important concepts and their mutual and contextual regularities;* *2. Understands current trends, processes and their influencing factors in matters related to environmental science and environmental protection.* *SKILLS:* *3. Comprehensively analyses the state of the environment and the quality of the environment and the factors affecting it, chooses the appropriate methods or possible solutions for investigating or preventing the problem;* *4. Applies methods of chemical analysis of environmental objects, performs field studies, data statistical processing, modelling in order to characterize the state of the environment or the object investigated;* *5. Conducts research activities in one of the sub-fields of environmental science, selects the necessary information, describes the situation and engages in reasoned discussions on the problematic issues of environmental science both with professionals in the field and other members of society;* *6. Uses information technologies and software, including field-specific software, for collecting, analyzing and communicating the results of data characterizing the state of the environment.* *COMPETENCE:* *7. Makes decisions based on qualitative and quantitative data in connection with planning sustainable development of environment and environmental quality improvement;* *8. Selects, analyses information, makes decisions in solving environmental problems, taking into account ethical, professional and administrative conditions, promoting environmental sustainability;* *9. Develops research in the chosen field of environmental science, promoting the development of environmental science.*
Final examination upon the completion of the study programme	*Bachelor's thesis*

Study programme forms

Full time studies - 3 years - latvian

Study type and form	*Full time studies*
Duration in full years	*3*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*120*
Admission requirements (in English)	*Secondary education*

Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Bachelor’s degree of Natural Sciences in Environmental Science*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
University of Latvia	RĪGA	RAIŅA BULVĀRIS 19, CENTRA RAJONS, RĪGA, LV-1050

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

During the reporting period, the bachelor's study programme "Environmental science" underwent both as content-related, as administrative changes. During the reporting period, within the study programme the following courses are included: VidZ1030 "Aspects of occupational and civil defense in environment protection" and VidZ1025 "Waste Management Basics and Te-chnologies". The study course, Geog1018 "Maps, remote sensing and GIS" was withdrawn from the study programme, but the study course Geog1042 "Introduction to spatial analysis in Environmental Science" was included. In addition to that, small changes have been made in the formulation of the study outcomes, for better corresponding to the existing regulatory framework.

During the reporting period, a new programme director, assist. prof. Imants Kukuļs, was approved for the study programme.

Study outcomes were evaluated. Taking into account the recommendations of employers, trends in the field and higher education, study outcomes were restructured; knowledge, skills and competencies were more clearly separated.

Further changes in the study programme are planned in connection with the changes in the Law on Higher Education Institutions and the transition to ECTS. In order to avoid the need to update the scope and content of the courses after the law enters into force, the necessary changes have been made and are planned to be implemented by academic year of 2024/2025. Changes include the elimination, merging of courses, reductions in the volume and content of the courses, or increases in the volume and content of the courses.

The most significant changes are related to the exclusion of the courses Ķīmi1038 "Chemistry for environmental and Earth sciences" and Fizi1010 "Earth Physics" from the programme. The course VidZ1013 "Introduction to Environmental Science Studies" is also excluded from the programme, but part of this course's content is included in the course VidZ1101 "Introduction to environmental Science". For several mandatory courses related to field-specific issues, such as Earth science, soil science, climatology, environmental chemistry, environmental law, nature protection, their course content has been updated, supplemented with up-to-date topics, resulting in the creation of new, larger courses included in the programme's plan (e.g., VidZ1099 "Environmental chemistry - basics", VidZ1102 "Soil and soil sustainable management").

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme

implementation) and evaluation of its usefulness.

The study programme corresponds to the study field “Environmental protection”. After graduating from the bachelor’s study programme “Environmental science”, graduates obtain a Bachelor’s degree of Natural Sciences in Environmental Science (Annex 22), which corresponds to the scientific subfield and the study field. The purpose, tasks and study outcomes of the study programme are defined in accordance with bachelor’s level studies in environmental science, allowing to acquire the necessary knowledge, skills and competences that directly correspond to the name of the study field and study programme. The first two numerals of the programme’s code (43431) describe the level of studies – academic education (bachelor’s degree), while the third to fifth numerals correspond to the study field – environmental science. The code is created correctly; it matches the other parameters of the programme.

The content of bachelor’s study programme “Environmental science” is designed so that students acquire the basics of environmental science and its subfields. The study process provides an opportunity to learn the interdisciplinary aspects of environmental science and up-to-date knowledge. Achieving the goals of the study programme is implemented through natural science courses, specialized courses, interdisciplinary courses.

The bachelor’s study programme “Environmental science” is realized within 3 years, which is an optimal period, because the students have the opportunity to obtain a bachelor’s degree in a relatively short time and to enter the labour market as qualified specialists quickly enough. Such a situation is also facilitated by social processes, namely, the desire of young people to get involved in the labour market as soon as possible.

The study programme and its content correspond to the obtainable Bachelor’s degree of Natural Sciences in Environmental Science in accordance with the state academic education standard (Regulations of the Cabinet of Ministers of 13.05.2014 No 240 “*Regulations Regarding the State Standard for the Academic Education*”, Annex 24). The conditions for admission to the study programme include the results demonstrated by the applicants in centralized exams of the Latvian language, foreign language and mathematics, as well as the average weighted grade in the subject “Geography”. Sufficient knowledge and skills in the mentioned subjects are important for successful engagement in the learning process and for acquiring knowledge and skills related to environmental science and research.

In general, it can be concluded that the content of the programme’s study courses, the degree to be obtained, the goals and tasks of the programme, as well as the admission conditions are fully compatible with each other. By completing the tasks of the programme, the students have achieved the goals of the programme, and as a result, the graduates of the program obtain a Natural Sciences Bachelor’s Degree in Environmental Science, which allows them to fully participate in the labour market, as well as to continue their studies in the master’s study programme.

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

The bachelor’s study programme “Environmental science” implemented at the UL FGES is one of two similar study programmes in Latvia, preparing specialists in environmental science. Besides the

UL, Daugavpils University also implements such a programme. At the Latvia University of Life Sciences and Technologies (in Jelgava) and Riga Technical University, bachelor's study programmes are implemented, focusing on environmental engineering sciences. The bachelor's study programme "Environmental science" contributes to the functions of state management and environmental quality control institutions of Latvia with the entry of prepared specialists into the labour market. The programme also provides private enterprises with specialists requiring the knowledge in environmental science for the provision of consulting services, development of production functions and environmental technologies. The bachelor's study programme "Environmental science" also provides research institutions with the youngest scientific personnel.

Prospective workplaces for graduates of the programme in Latvia are state and local government institutions (Ministry of Environment and Regional Development, Ministry of Agriculture, State Regional Development Agency, Latvian Centre for Environment, Geology and Meteorology, Nature Conservation Agency, State Environmental Service, State Plant Protection Service and municipalities). Part of the graduates get involved in work in private environmental enterprises and production companies. Graduates who have specialized in spatial data analysis during their studies work are involved in jobs in cartography and GIS providing companies.

Graduates interested in science successfully can find a job in research and educational institutions (UL FGES, Institute of Biology, Latvian State Forests Research Institute "Silava", Institute of Hydroecology, etc.).

The knowledge and skills provided by the programme allow to prepare specialists for the ever-changing labour market, in which, with purposeful specialization and deepening of existing knowledge, they can get involved in new labour market niches. Part of the graduates of the programme successfully continue their master's level studies.

Graduates' surveys. Graduates' surveys are conducted regularly, remotely using the *QuestionPro* and *MS Forms* survey platforms, in person at the faculty's graduates' gatherings, and also by asking graduates to comment on study programmes for prospective students. Opinions from graduates of environmental science study programmes working in various fields are available at: https://www.geo.lu.lv/par-mums/absolventu-stasti/vides-zinatnes-studiju-programmu-absolventu-stasti/ (available only in Latvian).

The previous comprehensive survey of graduates of the bachelor's study programme "Environmental science" was conducted in November 2022. An anonymous survey of bachelor's study programme's graduates was posted on the *QuestionPro* survey platform. The graduates of from 2016 to 2022 years of the programme were invited to participate in the survey. The responses of 60 graduates were summarized in compiling the results of the survey. The survey was filled out by 58.9% of graduates living and working in Riga, 13.3% of respondents living in regions of Latvia but working in Riga, 18.9% of respondents working in regions and 8.9% of graduates who living and working abroad. One of the goals of the bachelor's study programme is to prepare students for the master's studies. Most of the graduates of the bachelor's study programme have continued their studies in the master's studies (70%), but in recent years the mentioned number has significantly decreased, which can be explained by the COVID-19 pandemic, remote studies, as well as uncertainty about the study process (remotely or intramural) in the master's studies.

A large part of the graduates after graduating from the bachelor's study programme start working, which gives an opportunity to assess the readiness of the graduates for the labour market. By analyzing the respondents' employment, 81.1% of the respondents indicated that they work or have been in employment with an employer. Of these, 66.6% of graduates have worked in environmental science or related fields (geography, geology, ecology). Several respondents indicated that employers require graduation from a master's study programme, which also explains

that the answer to the question “Education gained facilitated entry into the labour market” received a rating of 2.9 points. One part of the graduates indicated that in the field of environmental protection in the labour market of Latvia, an inadequately low remuneration exists, which could be one of the reasons why some graduates do not recommend the study programme to others. Another part of the graduates indicated that the employer’s requirements burden them from combining work with studies at the master’s level.

Surveys of programme’s graduates reveal that the bachelor’s study programme is generally highly rated. Graduates are satisfied or very satisfied with the acquired knowledge and acquired skills and competences. The following aspects received the highest rating: the theoretical knowledge acquired in the study process, the ability to analyse and critically evaluate information based on the available information, the ability to make decisions. Individual respondents stated that the acquired knowledge and skills gave them the opportunity to successfully continue their studies at the universities abroad in Germany or Norway. **Table 3.1.3.1** provides summary of the graduates’ survey results of 2022.

Table 3.1.3.1.

The graduates’ survey results of 2022 of the bachelor’s study programme “Environmental science” on students’ satisfaction with the quality of studies and on the knowledge and skills acquired during the studies

The question: *Please rate the quality of studies in the bachelor’s study programme “Environmental Science”*	**Score**	**Deviation**
Selection of study programme	3	1.6
The quality of study programme in general	3.1	1.3
The obtained education contributed to the inclusion in the labour market	2.9	1.6
The impact of the study process on the personality to enter the labour market	3	1.4
Recommending the study programme to others (relatives, friends, others)	2.8	1.3
Compliance of the content of the study programme with the latest development trends	3.4	1.0
Importance and applicability of acquired knowledge in the workplace	2.9	1.3
Compliance of the acquired knowledge, skills and competences with the requirements of the modern labour market	3.4	1.0
Theoretical knowledge of the field	4.0	0.9
Research skills	3.6	1.1

Ability to apply knowledge	3.4	1.0
Ability to analyse, critically evaluate information	3.9	1.0
Ability to solve problems	3.4	1
Ability to analyse large amounts of information	3.8	0.9
Ability to make decisions based on information analysis	3.9	0.8
Communication skill	3.6	1.1

1 – very unsatisfied, 2 – unsatisfied, 3 – neutral, 4 – satisfied, 5 – very satisfied. A higher score indicates a higher rating of the particular aspect.

The graduates have mentioned shortcomings that need to be eliminated or implemented, as follows:

- *The need to increase the proportion of practical work in study courses or to increase practical-orientation courses;*
- *To expand the opportunities to specialize during studies, that could be implemented through a wider offer of Part B, including in cooperation with other study programmes implemented at the University of Latvia;*
- *To increase the involvement of the field-related organizations and companies in the learning process by offering guest lectures, applied study places, problem assignments and transfer of actual examples of the field-related issues for research or excursions to organizations;*
- *To promote the acquisition of field-specific and generally up-to-date computer programmes and computer skills, including those related to promoting the skills to data selecting and processing, and display the data in the most appropriate way;*
- *To update the content of courses more regularly with up-to-date issues in the field.*

Employers' surveys. Cooperation with employers takes place regularly. One of the most important opportunities for receiving feedback is employers-provided review about students after their applied study process, at the end of which part of the students become employees of the institution/company.

In addition to that, an employers' survey was conducted in January 2023, in which 7 employers reviewed their employees, graduates of the bachelor's study programme "Environmental science" of the last 6 years. The skills and knowledge of employees are mostly assessed as good and very good (**Table 3.1.3.2**). With the highest rating, employers review the skills to acquire new knowledge, find and process information, work with a computer. The ability of graduates to make and justify decisions is identified as a weaker point.

Table 3.1.3.2.

The employers' survey results of 2022 of the bachelor's study programme "Environmental science" on students' satisfaction with the quality of studies and on the knowledge and skills acquired during the studies

Please rate the skills of graduates (at the UL FGES) **who have obtained their education in the last 3 years on a five-point scale!** (*0 – I don't know, I cannot rate; 1 – very bad; 2 – bad; 3 – average; 4 – good; 5 – very good)*							
		0	*1*	*2*	*3*	*4*	*5*
1)	Theoretical knowledge					**X**	
2)	Practical skills					**X**	
3)	Ability to acquire new knowledge and skills						**X**
4)	Ability to identify and solve problems					**X**	
5)	Ability to find and process information						**X**
6)	Ability to work with numbers and mathematical operations					**X**	
7)	Ability to make decisions and justify them				**X**		
8)	Ability to propose new ideas and solutions					**X**	
9)	Ability to adapt to new conditions (in changing work environment)					**X**	
10)	Ability to work independently, determining work methods and due dates					**X**	
11)	Knowledge of Latvian						**X**
12)	Knowledge of foreign languages					**X**	
13)	Computer skills						**X**
14)	Communication skills (oral communication, business correspondence, report preparation, presentation, etc.)					**X**	
15)	Team working					**X**	
16)	Ability to plan, manage and organize the work of others					**X**	
17)	Responsible attitude to work					**X**	
18)	Competitiveness compared to graduates of similar programmes at other universities					**X**	

The evaluation of the applied studies for the 3rd year students have been very good, excellent or excellent so far, and the reviews have also been good. Such reviews reveal that prospective graduates of the programme are enough qualified to enter the labour market after graduating the programme.

Employers' recommendations (**Table 3.1.3.3**) for increasing the qualification and competitiveness of graduates of the programme are mainly related to the graduates' knowledge of the current issues of the field and the practical aspects of the activities of the organizations in the field.

Table 3.1.3.3.

Employers' recommendations on measures to increase the qualification of graduates of the bachelor's study programme "Environmental science"

The name of employer	Form of collaboration / Recommendations
Ministry of Environmental Protection and Regional Development of the Republic of Latvia	Inclusion of socioeconomic aspects in the study process; promoting students' interaction with the companies, state institutions and organizations of the field
"Estonian, Latvian & Lithuanian Environment" Ltd	Promoting students' applied and practical experience
Latvian Geospatial Information Agency	Promoting graduates' skills and knowledge in geodesy, remote sensing and geographic information systems
State Environmental Service of the Republic of Latvia	Following innovations and current events in the field of environmental protection in the public and private sector; promoting acquiring the aspects of practical implementation of environmental protection
Hydroecology Institute of Latvia	Engagement of students in research, elaboration of final theses
Nature Conservation Agency of the Republic of Latvia	Involvement of students in the work of the organization during applied studies; the employer is involved in giving individual lectures of the courses

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

During the accreditation period, all students of the bachelor's study programme "Environmental science" were involved in full-time intramural studies provided in Latvian. The only exception is exchange students who have studied part of the lectures, practical and laboratory work in English. Data on the dynamics of the number of students for the last 6 years (Annex 23) reveal that the number of matriculated students is not changing, but the number of graduates changes, and the total number of students has decreased in the last 3 years.

The consistently high number of matriculated students during the reporting period indicates the high demand for the study programme, remaining unchanged despite the decrease in the total general number of secondary education graduates in Latvia. The beginning of the decline in the

total number of students coincides with the academic year of 2019/2020. This academic year marks a period in which studies were conducted remotely due to the restrictions of the COVID-19 pandemic. During this time, the lowest number of students graduated from the programme in the reporting period. The results of students' interviews reveal that as an outcome of remote studies, the motivation of students to continue their initiated studies has decreased. The number of students resuming their studies increased in the post-COVID-19 time, thus the number of graduates has increased slightly in recent years.

A number of various measures are taken to attract the secondary school graduates and reduce students' attrition. First of all, advertising activities are carried out in educational institutions, exhibitions, media and online environment to attract prospective students. Particularly noteworthy is the attraction of pupils to the school of young environmental scientists "Environmental Academy", the purpose of which is to increase young people's interest in environmental science and possible studies in the bachelor's study programme "Environmental science". In order to reduce students' attrition, several measures are implemented: regular meetings of course officials and teaching staff; the mentor program implemented by the UL; the 1st year curator; individual support for students by university teaching staff.

The restrictions imposed by COVID-19 have also affected the students' mobility, which has decreased during the reporting period. Apart from the COVID-19 movement restrictions, which were the main reason for the reduction in the number of Erasmus+ exchange students, students' mobility is also affected by the increase in living costs in the host countries and students' reluctance to terminate their legal employment relationships in Latvia.

During the reporting period, students of the bachelor's study programme "Environmental science" have visited various universities abroad. The most popular destination was Germany, but during the reporting period, students were also studying at universities in Sweden, Italy, Estonia and the Netherlands.

Application for students' mobility within the Erasmus+ programme is organized centrally at the UL FGES. Information activities for students are carried out, followed by application of students and individual interviews. Preference is given to students with higher academic achievements, as well as to senior year students.

Additional new measures have also been introduced to promote students' mobility – students are introduced to the opportunities of the Erasmus+ programme already during the first semester. Solutions are being sought for those interested, including the creation of an individual study plan. In the further development stage of the study programme, changes are foreseen in the study plan to facilitate the planning of students' mobility in the 3rd academic year.

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The bachelor's study programme "Environmental science" complies with the Lisbon Convention, the Bologna Declaration and other international documents regulating higher education. The duration of studies is six semesters or 3 years. At the end of the studies, a bachelor's thesis is elaborated – an original research in one of the subfields of environmental science.

The content the bachelor's study programme "Environmental science" is created in accordance with the Regulations of the Cabinet of Ministers No 240 *Regulations Regarding the State Standard for the Academic Education* (13.05.2014), current trends in the labour market and the latest scientific tendencies in the field. The offer of study courses is developed according to the recommendations in cooperation with industry professionals and employers, as well as taking into account the recommendations of graduates and the students. The study programme is grounded in the specific courses of natural and environmental sciences, forming the necessary theoretical basis for understanding natural and environmental processes. The results of employers' and graduates' surveys are taken into account in updating the content of the study programme, for example, the development of the field and the labour market related to spatial analysis and GIS determined the creation and inclusion of a new course (Ģeog1042 "Introduction to spatial analysis in Environmental Science") in the programme. The development of climate and environmental policy at the national and the EU level contributed to the inclusion of a new course VidZ2063 "Energy and environment" in Part B of the programme. The content also corresponds to the level of the bachelor's study programme.

The goals, tasks and achievable outcomes of the study courses are defined taking into account the improvement of in-depth knowledge and skills in natural sciences, as well as the acquisition of knowledge in interdisciplinary issues of environmental science. Such study outcomes are achieved through the basic study courses in natural sciences and environmental science. Specialization in one of the subfields of environmental science is possible during the learning process of elective courses.

The achievable outcomes of the study programme and also the study courses anticipate that students are able to demonstrate knowledge in the environmental field, understand the most important natural processes, risks, are able to select, analyse the necessary information, apply the necessary research and practical methods to carry out research work in environmental science. It means that the study courses correspond to the programme's goal "*To provide students with basic academic and professional knowledge in environmental science as an interdisciplinary science, including acquiring the theoretical and methodological background of environmental science and related fields of science, at the same time, providing students independently solving current theoretical and practical problems in environmental science, ensuring the application of this knowledge in research and practice*", tasks and achievable outcomes.

Mandatory Part A of the bachelor's study programme "Environmental science" consists of courses in natural sciences and specific courses in environmental science. In the first two semesters,

students acquire only the courses of Part A, where they strengthen basic knowledge in natural sciences and are introduced to the specific subjects of environmental science. In the fall semester of the 1st year, students acquire a foreign language ("English I"; 2 CP, credit points / 3 ECTS) and the courses "Introduction in Earth sciences" (4 CP / 6 ECTS), "Biology in the laboratory" (2 CP / 3 ECTS), "Environmental chemistry - basics" (6 CP / 9 ECTS), "Introduction to environmental science" (4 CP / 6 ECTS) and "Aspects of occupational and civil defense in environment protection" (2 CP / 3 ECTS). During the spring semester, students within Part A study the specific courses of the field – "Soil and its sustainable use" (4 CP / 6 ECTS), "Introduction to climatology with fundamentals of meteorology" (4 CP / 6 ECTS), "Introduction to spatial analysis in Environmental Science" (4 CP / 6 ECTS), "Diversity of living organisms and its protection" (4 CP/6 ECTS). At the end of the semester, students consolidate the theoretical knowledge acquired in the courses by working in field conditions within the field course "Field methods of environment and Earth Sciences" (4 CP / 6 ECTS).

The second year of studies includes the courses of Part A and Part B. From the courses of Part A, students acquire the course "Data Analysis in Environmental and Geosciences" (4 CP / 6 ECTS) in the fall semester, and in the spring semester – the courses "Ecology in environmental science" (4 CP / 6 ECTS) and "Hydrology and hydrometry" (4 CP / 6 ECTS) for which fieldwork is also planned. Also the second year of studies is completed by consolidating students' knowledge in the field course "Field methods in environmental science" (2 CP / 3 ECTS).

The third academic year stands out with a block of environmental management courses, in which students apply the acquired knowledge of natural sciences and field-specific subjects in the contexts of environmental management:

- "Environmental management" (4 CP / 6 ECTS);
- "Environmental economics and sustainability" (4 CP / 6 ECTS);
- "Environmental law" (4 CP / 6 ECTS);
- "Environmental and climate technologies" (4 CP / 6 ECTS).

Students begin to acquire the courses of the elective Part B in the fall semester of the 2nd year. In this semester, students have to acquire the courses of 12 CP / 18 ECTS from the offered ones: "Principles of Paleoecology" (4 CP / 6 ECTS), "Environmental Geology and Risks" (4 CP / 6 ECTS), "Geographical Information Systems" (4 CP / 6 ECTS) and "Environmental monitoring and environmental bioindication" (4 CP / 6 ECTS). In the spring semester, following courses are offered to students: "Ecology of the Baltic Sea" (4 CP / 6 ECTS), "Quality of the living environment" (4 CP / 6 ECTS), "Geomorphology" (4 CP / 6 ECTS), "Nature protection management" (2 CP / 3 ECTS) and "Weather practical forecasting" (2 CP / 3 ECTS), from which the student chooses the courses in the amount of 10 CP / 15 ECTS. Accordingly, during the 2nd year, students have the choice to supplement their knowledge in the field-specific courses or expand their knowledge in more practical courses related to the field.

During the 3rd year of studies, in the fall semester, students acquire the courses of elective Part B take in the volume of 4 CP / 6 ECTS. The knowledge is acquired in one of the theoretical courses "Fundamentals of waste management and applicable technologies" (4 CP / 6 ECTS) or "Ecology of Latvian inland waters" (4 CP / 6 ECTS), or acquiring of knowledge and skills based on the work environment in the course "Principles of applied studies of environmental sciences" (4 CP / 6 ECTS) is possible. In the spring semester, students can choose from a wider range of courses, according to the plan, the courses are as follows: "Protection and management of fish and game fauna" (2 CP / 3 ECTS), "Frameworks for sustainable development" (4 CP / 6 ECTS), "Resource valuation and management" (4 CP / 6 ECTS), "Environment and energetics" (2 CP / 3 ECTS), "Standartization in environmental science" (2 CP / 3 ECTS). Accordingly, during the third year, students have the

opportunity to deepen their knowledge in the courses related to environmental management, or to expand their academic comprehension in the courses of environmental science.

In addition to the listed courses, the procedure for elaborating students' final thesis comprise 12 CP / 18 ECTS, which includes the course "B.Sc. Thesis - Project" (2 CP / 3 ECTS) in the fall semester of the 2nd year of studies, during which students acquire the necessary basic skills and update the possible topics of the final thesis in order a bachelor's thesis could be developed (the course "B.Sc. Thesis", 10 CP / 15 ECTS) during the spring semester of the 3rd year of studies.

In Part C of the programme, students choose a free elective course in the volume of 2 / 3 ECTS CP.

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

During the study courses and examinations, both oral, written, and combined study and assessment methods are used.

Studies employ a variety of knowledge acquisition and consolidation methods, such as introductory lectures, interactive lectures, consolidating lectures, and problem-oriented lectures. Practitioners and professionals from different institutions are invited to teach individual lectures in study courses to promote the unity of theory and practice. Practical assignments, seminars, individual, pair and group work, discussions and project development, study tours to industry organisations are widely used. Employers are involved in the implementation and improvement of study courses (they are invited to conduct separate seminars, often the classes are organised as work experience visits, etc.).

To promote the development of students' research competence, students in successive courses have an opportunity to analyse and deepen their research on the issues of interest in the given field. Senior year students are involved in peer teaching-learning.

Seminars in study courses promote students' presentation and discussion skills. To aid students in achieving learning outcomes – in acquiring and consolidating knowledge, skills, and competence – student-centred methods dominate in the study process. The study process is supported by methods that facilitate students' communication in the implementation of study tasks, solving real-

world problems, modelling situations.

The physical environment of studies is also gradually changing – classrooms are easily transformable for group work, individual work, students can use digital technologies. Lecturers use methods that encourage students' active participation, critical thinking, and reflection. The e-study environment is used in the study process and to promote independent studies. Each study course has an e-study environment (*Moodle*) where students have access to materials from classes, task descriptions in addition to course-related learning materials, as well as study tasks (tests, forums, seminars, conferences, etc.). All interim and final assessment grades of the study courses are recorded, justified, and made available to students in the e-study environment.

The student-centred approach is followed in updating the study programmes and the respective study courses, paying special attention to meaningful formulation of learning outcomes, thus promoting dialogue between lecturers and students on the content of studies, forms, and methods of organisation. Well-formulated learning outcomes, on the other hand, promote students' understanding and co-responsibility for their own learning, self-assessment, and understanding of the assessment they receive. During the study process, lecturers use methods, examination forms and assessment criteria that are appropriate to the study goal and intended learning outcomes.

Students receive support and feedback from the lecturers during the study process. Assessment criteria for grading are made public in advance. The assessment gives students an opportunity to demonstrate the extent to which they have achieved the intended learning outcomes.

Following the principles of student-centred studies, student mobility (recognition of learning outcomes) is promoted; students engage in academic research and social activities initiated by the academic staff, thereby gaining extensive experience and evaluating gained knowledge and skills in practice. By implementing internal quality assurance policies, study programmes are implemented to encourage students to actively participate in the improvement of the study process. There are procedures and regulations for submitting student proposals and complaints and reviewing student appeals. The results of student surveys are evaluated and considered for the improvement of the study process. Students are eager to express their proposals for the improvement of study programmes and processes in discussions with teaching staff and programme directors.

The methods applied in the study programme and the implementation of the study process result from the purpose of the study programme, course content and study outcomes. By observing the study principles of student-centred education, the content of the study course is updated and a meaningful definition of study outcomes is carried out. Implementation of each specific study course and the further studies and also the chosen methods result from the defined study outcomes.

The most important group of study outcomes is students’ knowledge. Lectures are an integral part of achieving knowledge goals in study courses. During recent years, in the process of remote learning, video lectures have been prepared for various courses on the course topics, which students can use in their learning process. In order to supplement theoretical knowledge, seminars are held in the process of study courses, students conduct independent literature studies and prepare reports on various topics.

Not less important role in the study process is also attributed to the practical works and laboratory works included in the content of several courses, within the framework of which students acquire the essential skills and knowledge in the field. As part of laboratory work, students determine various parameters characterizing the state of the environment using chemical, physical and biological methods. It should also be noted the laboratory work carried out within the framework of various courses, in which students acquire the skills of field-specific information processing,

analysis and presentation. An important group of skills – spatial information analysis – is acquired in practical work using up-to-date GIS software.

The specifics of the field, thus also defined study outcomes of the study programme, requires students' skills to perform the necessary research or data acquisition activities in field conditions. Acquisition of these skills and competencies is implemented within the field courses.

A significant aspect of the study plan is also the opportunity to interact with the representatives and professionals of the field. During the implementation of several courses, the representatives of the field deliver guest lectures. Students get a more in-depth involvement in professional activities during the course "Principles of applied studies of environmental sciences", during which students are involved in internships and work assignments in the company or organization of their chosen field.

The bachelor's thesis elaborated at the end of the studies ensures the realisation of research and analysis competencies.

To ensure the implementation of the student-centred approach, the most appropriate type of examination is applied to each of the defined study outcomes. The course examination and criteria for successful completion of the course are defined in the study course descriptions, and they are explained in the implementation process of the course. Within one course, various examination types are possible if the defined study outcomes provide for it, for example, the quality of the performance of practical or laboratory work, the knowledge presented in theoretical exams, the quality of the prepared reports or self-assessment of the ability to cooperate in a group during the field studies. At all evaluation stages, students receive feedback from the university lecturers of the course, thus allowing the student to obtain more objective information about own performance.

The study environment is also gradually changing – both physical and electronic. The premises and their equipment in the House of Nature of the UL Academic Centre at Jelgava Street 1 in Riga allow a quick transformation of the learning environment for various formats of classes – lectures, seminars, group work, discussions. New equipment is being introduced in the laboratory equipment, and students have the opportunity to use it in the elaboration of their final theses. Improvements in the electronic environment take place in various aspects, for example, the provision of relevant software for spatial analysis, data analysis, as well as special software for modelling the spread of pollution levels, etc. However, in major changes in electronic environment occur in the context of communication and information circulation. An e-study environment is used in the study process and to promote independent studies. For all study courses, an e-study environment has been created, where students have access to lesson materials, task descriptions, tests, etc., but in recent years, video lectures have also been placed the e-study environment for particular courses. Study results and evaluations are also communicated using the e-study environment. Since 2020, the *Microsoft Teams* platform has been a part of the study process in the UL and also in the bachelor's study programme "Environmental science", providing more convenient remote communication between students and lecturers, and also offers students remote cooperation opportunities during the implementation of common study tasks.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for

students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

The study process of the bachelor's study programme "Environmental science" ends with the bachelor's thesis elaborated independently by the students. The final thesis is developed in accordance with the UL Order *Requirements for Elaboration and Defending of the Graduation Papers (bachelor's, master's, diploma, and qualification papers) at the University of Latvia* (Order No 1/38 of 03.02.2012) and in accordance with the UL FGES Regulations "On final theses elaboration and defence procedures in geography, geology, environmental science, spatial planning and teachers' professional study programmes" (https://www.geo.lu.lv/en/studies/study-process/final-theses/development-and-defence-of-final-thesis/; approved at UL FGES Council meeting on 19.03.2018). The final thesis is evaluated by the final examination committee of the bachelor's study programme "Environmental science". In the evaluation process, the submitted final thesis, the presentation of the research results and the justified answers to the questions of the commission and the work reviewer are assessed. Taking into account the demonstrated performance during the thesis defence and also the recommendations included in the reviewer's comments, the commission provides an evaluation of the work, regarding its compliance with the requirements of the final thesis in environmental science and its grading out of 10 points.

Students' final theses are elaborated on the topic proposed by the academic staff or on the issues in which students want to gain in-depth knowledge. During the selection process of the topic, consultation occur with academic staff specialized in a specific research field and conducting research in a particular project. It gives the opportunity to bachelor's students to join a research team while developing a final thesis.

During the study process, students are provided with support in choosing a topic starting from the 1st semester of studies. In the 1st year of studies, within the course "Introduction to environmental science", students are introduced to the academic staff of the Departament of Environmental Science, implemented research and possible topics for the elaboration of a bachelor's thesis. Within the course, students carry out theoretical research of the topic. In the second year of studies, within the course "Bachelor's thesis – project", students define research goals and tasks and conduct literature studies, develop the theoretical basis of the research and the research implementation plan. If the topic chosen by the student does not change in the first and second year of studies, the compilation of literature sources and the content of the project serve as the basis for the

development of the final thesis in the third year of studies.

Final thesis must be elaborated independently and must meet the requirements of a scientific work:

- Scientific research in one of the subfields of environmental science;
- The result of the work is based on field or chamber research data of the environmental object, information from literature and other information sources, and independently conducted research materials;
- The process of the research is logical, successive, the results are generalizable and unambiguous;
- Terminology approved and applied in the field and abbreviations according to standards are used in the work;
- Within the work, the views of the author are distinguished from those of other authors;
- The work is written in the literary correct state language.

Before submitting the final thesis to the final examination committee, the UL performs centralized plagiarism check whether the work does not contain plagiarism.

In the period since 2017, 121 bachelor theses have been defended by the graduates of the study programme; see **Figure 3.2.6** for grading proportion of defended final thesis over several academic years.

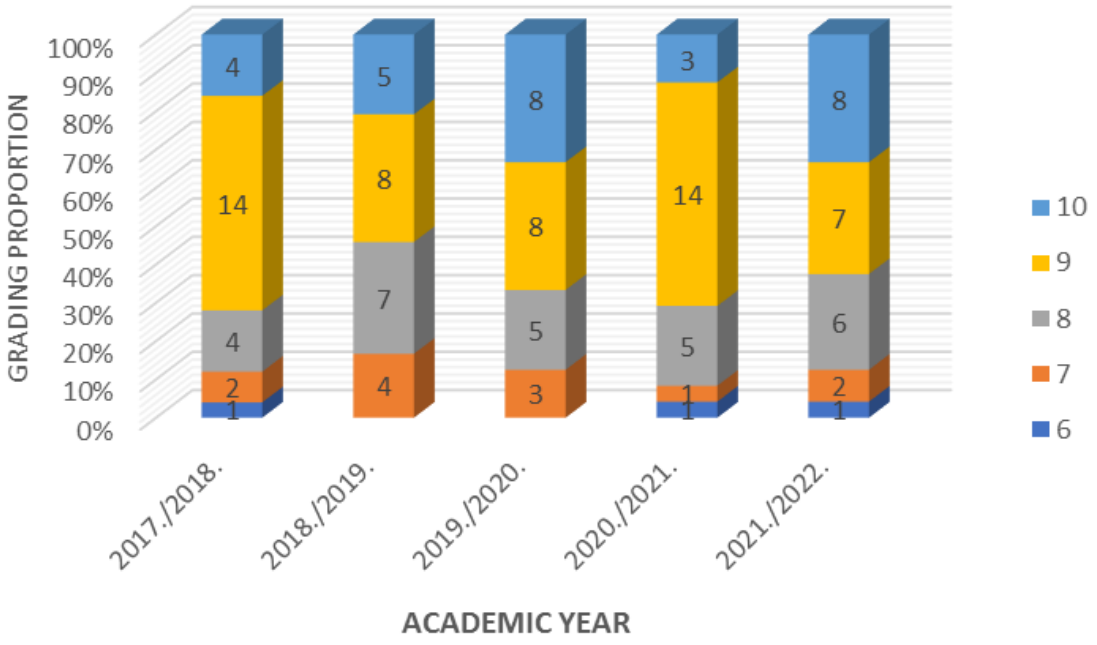


Fig. 3.2.6.1. *Grading of bachelor's theses in academic years from 2017/2018 to 2021/2022*

The study results of the bachelor's study programme "Environmental science" within the framework of the final theses are implemented through a wide range of topics related to the current issues and research directions of the field. In general, the division of the topics of final theses also reflects the internal structure of the department and the research directions of the academic staff: methodological solutions and state of natural resources and ecosystems assessment, factors affecting the quality of the environment, sustainable use of natural resources, nature protection solutions to ensure biological diversity, environmental pollution and monitoring, environmental management and planning solutions, environmental risk assessment, modelling of environmental processes, etc.

From year to year, the proportion of theses elaborated among the research directions changes. It is

influenced by the topicality of the subject matters and also by the scientific projects implemented by the UL FGES. Examples of developed and defended final theses' topics are as follows:

- Small landscape elements and their changes in Ukri parish at the juncture of the 20th and 21st century;
- Options for electric vehicle charging infrastructure in the courtyards of large-scale residential areas: example of the Ziepniekkalns area;
- Quantitative assessment of the effectiveness of air quality improvement measures in street canyons;
- Diversity and distribution of birds in the parks of the central part of Riga;
- Extractive substances of parasitic funghi chaga (*Inonotus obliquus*) and their potential for use;
- Long-term and seasonal changes in the hydrological regime of the Bārta, Ogre, Pededze rivers under climate change conditions;
- Factors affecting development of cyanobacteria in waters of the eastern coast of the Gulf of Riga;
- Effectiveness of methods of ecological restoration of grassland habitats in the short term: example of the *GrassLIFE*

In general, it can be concluded that the topics of the final theses correspond to the title and content of the study programme, student research is relevant and up-to-date in the field of environmental science. The results of the final theses (**Figure 3.2.6.1.**) reveal that students have acquired in-depth knowledge in one of the subfields of environmental science, students are able to independently gain, summarize, critically analyse and interpret the obtained results.

The relatively large proportion of final theses implemented as part of larger research projects indicates that students acquire in-depth knowledge in the current fields of environmental protection and environmental science, which allows them to enter the labour market, and also opens opportunities for students to perform the research at the following study levels.

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

The bachelor's study programme "Environmental science" is implemented at the UL Academic Centre, providing students with the opportunity to study in modern premises – suitable auditoriums and well-equipped laboratories.

The information base of the study programme for the study process and the development of final theses is provided by the UL Natural Sciences Library, providing access to both as printed sources in the premises of the UL Academic Centre, as the option to receive resources from other libraries in Latvia. A substantial part of the informative base is also the offered access to the range of subscribed databases: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/.

In addition to that, e-study courses in the Moodle environment are created for all study courses of the programme, where students have access to study materials and tasks, as well as videos from lectures and demonstrations created by the teaching staff.

The material and technical base has been formed as a result of the development of research directions. The material and technical base is regularly supplemented, especially if it is necessary to ensure the acquisition of the defined and up-to-date skills indicated by the study process.

The material and technical support includes both as the simplest tools for performing field work and collecting environmental samples – probes, drills, indicators, etc., as portable measuring devices for determining solid particles, measuring noise, measuring electromagnetic radiation, determining air quality, etc.

A wide range of equipment is also available applicable for the students' laboratory works and elaboration of theses, such as Soxhlet extractor (*Behr Labor-Technik*), microwave facility (*Milestone*), spray dryer (*LabPlant*), ultrasonic facility (*Vibra Cell*), lyophilizer (*Labconco*), vacuum oven , rotary evaporator (*Heidolph*), gas-liquid chromatographs with mass spectrometric detection GCMS-QP2010 Ultra (*Shimadzu*), GC-MS Clarus 680/SQ8C (*Perkin Elmer*), LC-MS/MS spectrometer with Acquity UPLC system, equipment for preparative chromatography (*Biotage, Shimadzu*), UV-VIS spectrometer (*Hach-Lange, Shimadzu*), fluorescence spectrometer (*Horiba, Aqualog*), atomic absorption spectrometer, inductively coupled plasma analyzer with optical emission detection and others. Automated phosphorus analyzer, Kjeldahl nitrogen determination device, CN analyzer and other equipment are used for water and soil research. A microscope (*ZEISS Stemi 508*) is available for microscopy work with the option of displaying the visible image on a computer, projector or obtaining high-quality digital photographs.

In general, it can be concluded that the material and technical support is sufficient to implement the learning process in a qualitative manner and to achieve the set objectives.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

Revenues of the programme

To ensure the necessary funds for the implementation of the study programme "Environmental science", the UL uses a state budget grant from the Ministry of Education and Science and tuition fee. Report on student (prospective) distribution by study types and annual income is presented in

the **Table 3.3.3.1**.

Table 3.3.3.1

Number of students in the programme and annual income

Type of study	LV state funded	LV for tuition fee	EU/EEA/Swiss citizens* for tuition fee	Others** for tuition fee	Total	State subsidy	For tuition fee LV and EU/EEA/Swiss citizens	Fee for citizens of other countries	Annual income
	No	**No**	**No**	**No**	**No**	**EUR**	**EUR**	**EUR**	**EUR**
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*1*6+(2+3)*7+4*8*
FTS (in Latvian)	100	10	0	0	110	3,097	2,200	0	331,700
FTS (in English)	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**110**	**0**	**0**	**0**	**331,700**

* EU/EEA/Swiss citizens – European Union / European Economic Area / Swiss Confederation.

** Others – outside of EU/EEA/Swiss Confederation.

Programme costs

To estimate the amount of funds required for financial provision, the prime cost of study programmes at the UL is calculated according to the methodology developed by the UL, which takes into account the cost of ensuring the study process and information on the study programme plan, teaching staff involved, planned number of students and other aspects described in the "Financial Support System", thus ensuring the reliability of forecasts.

Programme costs for the **full-time regular studies in Latvian (FTS)**

For calculations, the implementers of the full-time regular study programme "Environmental science" uses data of the academic year 2022/2023 – number of students on 01.10.2022, study plan/normative acts and structure of the involved academic staff. Based on these data, total cost of the programme is 276,967 EUR per year, and its structure (percentage distribution) presented in the **Table 3.3.3.2**.

Table 3.3.3.2

Percentage breakdown of costs in the study programme

Expenditure item	% of total
Teaching staff costs	52%
General staff	19%
Other payments	
Infrastructure expenditure	11%
Property and services	2%

Indirect costs	16%
TOTAL COSTS	**100%**

In **Figure 3.3.3.1**, the prime cost of the study programme is visually represented by the red line (vertical axis) depending on the number of students (horizontal axis), indicated average weighted tuition fee (green line).

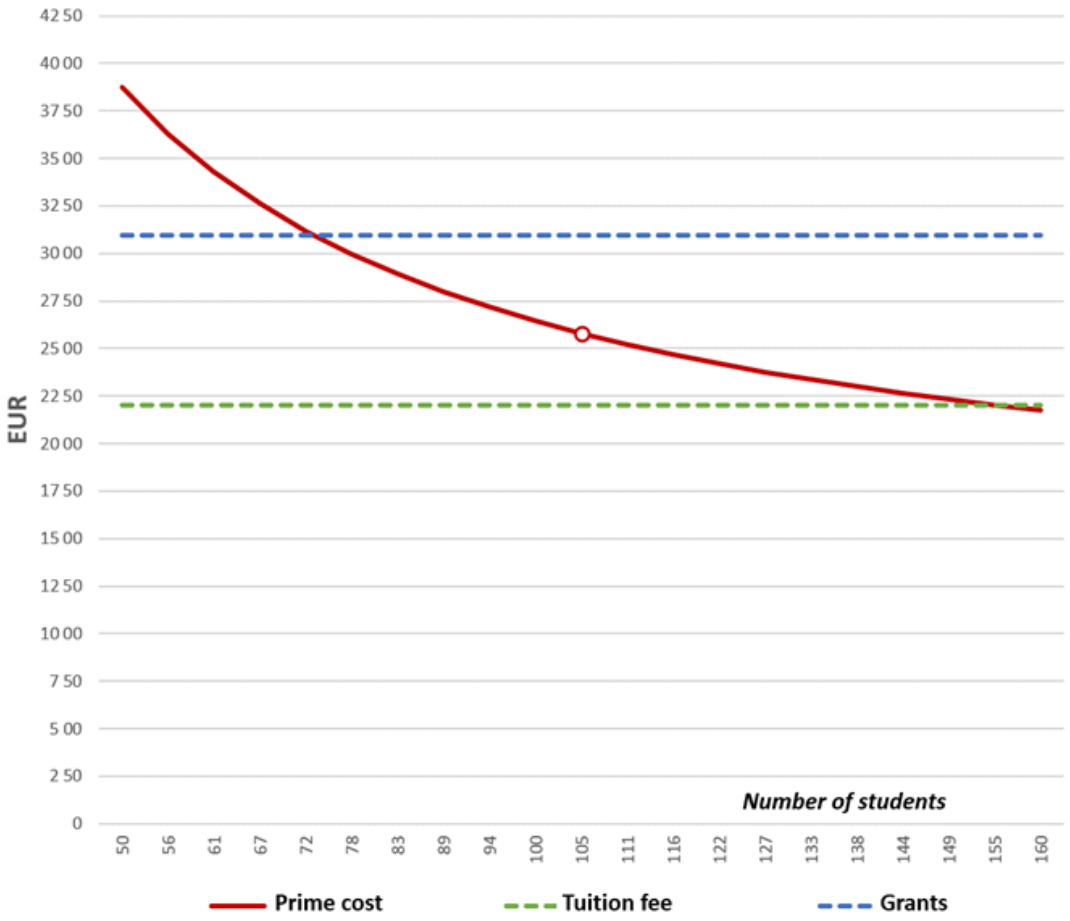


Fig. 3.3.3.1. *Prime cost per number of students of the academic bachelor's study programme "Environmental science"*

Based on the structure of the cost and total number of 108 students the cost of study programme per one student (prime cost) is 2547 EUR per year.

For the programme to be profitable, the minimum number of paying students should be at least 160 (intersection point of red line and green line) or state funded number of students – at least 75 (intersection point of red line and blue line).

Summary of the revenue and expenditure of the programme

Table 3.3.3.3. summarises expected number of students, revenue, expenditure, result and profitability (result against revenue, %) of the programme for all forms of implementation.

Table 3.3.3.3.

The result of the programme

Type of study	Total	Total revenue	Total expenditure	Result	Profitability
	Number	EUR	EUR	EUR	%
Full-time intramural studies (in Latvian)	108	279,966	276,967	2999	*1%*
Total	**108**	**279,966**	**276,967**	**2999**	***1%***

The study programme in all forms of its implementation (full-time intramural studies) is profitable. In general, the expected revenues exceed the expenses and their realization does not require support from other financial resources.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

The implementation of the study programme is provided by involvement of 6 professors (18% of the total study load provision), 8 associate professors (19%, respectively), 16 assistant professors (51%), 4 university lecturers (6%), 9 university teachers (5%) and 2 researchers (1%). All the staff involved in teaching the courses have a doctor’s or master’s degree.

In total, 14 associate professors and professors are involved in the implementation of the programme, that corresponds to Article 55, Part 1, Clause 3 of the Law on Higher Education Institutions, stipulating that no less than five professors and associate professors elected at a given higher education institution must participate in the implementation of the mandatory and restricted elective part of the academic study programme.

In parallel with teaching university courses, the academic staff is actively involved in research activities, participates in the development of international projects and those financed by the Latvian Council of Science, directly affecting the study process. In most cases, the research is related to the study courses implemented in the study programme, for example “Basics of environmental chemistry”, “Soil and its sustainable use”, “Introduction to climatology with the basics of meteorology”, “Environmental monitoring and environmental bioindication”, “Basics of paleoecology”, “Environmental management”, “Environmental and climate technologies”, etc.

Current research, as well as participation in scientific conferences and other events ensure the

inclusion of up-to-date knowledge in the field in study courses. For example, the inclusion of research results in theoretical lessons, practical demonstrations of research methods or the application of new methods in practical works.

Raising the qualification of teaching staff in various continuing education programmes is also of great importance. In 2019-2021, teaching staff of the bachelor's study programme "Environmental science" were actively involved in the project No 8.2.2.0/18/A/010 "Renewal of Academic Staff and Development of Competencies at the University of Latvia" as participants of various training programmes offered within this project. The significant course is "English language" (216 hours), attended by several university lecturers of the programme: assoc. prof. R. Kasparinskis, assist. prof. Z. Penēze, assoc. prof. S. Rūsiņa, assoc. prof. I. Strautnieks, assoc. prof. I. Šteinberga, assist. prof. I. Kukuļs, *Dr. geogr.* L. Dobkeviča.

The 36-hour course "Development of competencies of academic staff in the field of leadership" was completed by *Dr. geogr.* L. Dobkeviča, assist. prof. I. Kukuļs, assist. prof. J. Lapinskis, assist. prof. Z. Penēze, assoc. prof. S. Rūsiņa, assoc. prof. I. Šteinberga.

Among the most attended courses are the courses "Digital media literacy", "Public speaking, speech art and basics of presentation for cooperation with industry and audience", "Commercialization lessons", etc. It should be noted that the course "E-environment Moodle. The practical recommendations for the e-environment" were developed and the course was conducted by assoc. prof. I. Šteinberga.

In general, the high qualification of the teaching staff, specialization in various subfields of environmental science, involvement in research contribute to the successful achievement of study results of the study programme. The wide specialization of teaching staff is also important for the quality of the study programme if environmental science as an interdisciplinary study programme. The teaching staff members hold doctoral degrees in both as natural sciences (geography, geology, chemistry, biology, physics), as social sciences and humanities (law, economics). Therefore, it is ensured that the content of the programme is implemented by a teaching staff specialized in the specific subfield, for example, the studies of ecology and biological diversity aspects are provided by academic staff holding a doctoral degree in biology, issues of pollution and the impacts of substances, as well as laboratory analysis methods are taught by academic staff holding a doctoral degree in chemistry. Environmental management and environmental policy issues are taught by teaching staff holding doctoral degrees in law and economics.

Regular improvement of pedagogic, digital and leadership skills makes it possible to ensure the entry of the latest methods and higher quality digital material into the study programme. Improving the English language knowledge and skills in the future opens up the possibility to provide a part of the courses in English as well.

The above-mentioned facts determine the implementation of the *Regulations Regarding the State Standard for the Academic Education* (Part II, Articles 4 and 5):

- The main goal of the bachelor's study programme is to provide a set of knowledge, skills and competence in accordance with the knowledge, skills and competence of the level 6 of the framework structure determined in the Classification of Education in Latvia
- The content of the bachelor's study programme ensures the achievement of scientifically grounded study results of a wide profile.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

Since 2013/2014, the composition of the teaching staff has changed, the qualification of the teaching staff has increased, and the renewal of the teaching staff has also taken place. During the reporting period, new professors and assistant professors were elected, and former university lecturers were also elected to the position of associate professors. For example, Normunds Stivriņš, who specializes in palaeoenvironmental research, has been elected as a professor. The university lecturers of three courses – R. Kasparinskis, S. Rūsiņa and I. Šteinberga have been elected as associate professors. Comparison of teaching staff is outlined in **Table 3.4.2.1**.

Table 3.4.2.1.

Comparison of teaching staff in 2017 and 2022 involved in the bachelor's programme "Environmental Science"

Academic position / Year	**2017**	**2022**
Professors	7	6
Assoc .professors	3	8
Assistant professors	17	16
Senior researchers, researchers, university lecturers, university teachers	9	14
TOTAL	**36**	**44**

5 university lecturers of courses have been elected as assistant professors: J. Brizga, I. Kukuļs, L. Kļaviņa, O. Purmalis and J. Burlakovs.

The professionalism, academic growth and renewal of the teaching staff of the bachelor's study programme "Environmental science" have a positive effect on the development of the programme. The inclusion of new assistant professors and professors as the programme implementers ensures that students acquire the current issues of the field during the learning process. For example, the specialization of J. Brizga in issues of sustainability and sustainable economy provides students with opportunities to learn the most current sustainability measurement tools, economic model evaluation skills. The competences of lecturer V. Obuka and assit.prof. O. Purmalis ensure the acquiring of bioeconomy issues, while J. Burlakovs provides the most up-to-date knowledge in remediation and rehabilitation of the environment. Further research by young researchers and scientists also provides the opportunity to include new courses in the study programme in the future.

Basic information about the teaching staff involved in the implementation of the study direction is included in the Annexes:

- basic information – Annex 11;
- CV of teaching staff (in Europass format).

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in

Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

In the academic year of 2022/2023, 44 teaching staff members participated in the implementation of the bachelor's study programme "Environmental science"; therefore, the current ratio of teaching staff to one student is 1:2.45, which is sufficient to ensure quality education.

The mutual cooperation of the involved teaching staff is appreciable, because the mutual cooperation is implemented in different ways, according to the need. University teaching of interdisciplinary or joint courses is one of the cooperation ways. In courses such as "Fundamentals of spatial analysis in environmental science" or "Environmental economics and sustainability", teaching staff collaborate and each involved university lecturer implements a part of the course content. In the field course "Field methods in environmental and Earth sciences", teaching staff agree on similar principles of the course implementation and performance evaluation, allowing students to better orientate themselves in field course development and evaluation aspects.

Formal issues affecting the development of the study process are reviewed by the Council of the study programme. Based on individual conversations with university lecturers, students' self-government recommendations and also evaluations of study courses provided by students, various opportunities for the improvement of courses are encouraged, innovations in the content of courses have been introduced, new courses have also been developed and included in the programme's plan.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	22P_Bsc_Diploma.docx	22P_VidZ_bak_Diploms_ar_pielikumu.docx
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	23P_BSc_Env sci statistics.docx	23P_statistika par studejosiem parskata perioda.docx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	24P_BSP_Compliance with HE standarts (ENG).docx	24P_BSP_Stud_progr-atbilstība_valsts_izglītības_standartam_AkD.docx
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	25P_Cours-mapping.xlsx	25P_Kursu-kartejums-Vide-BSC.xlsx
The curriculum of the study programme (for each type and form of the implementation of the study programme)	26P_BSP_Env_Sc_prog_plan.docx	26P_BSP_VidZ_programmas_plans.docx
Descriptions of the study courses/ modules	27P_Cours_description(1).docx	27P_Kursu-apraksti-BSc-Vide.docx
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)	J_55.3_pants_ENG.pdf	55.3_pants_Apliecinajums.edoc

Research and Protection of Cultural and Environmental Heritage (43431)

Study field	*Environmental Protection*
ProcedureStudyProgram.Name	*Research and Protection of Cultural and Environmental Heritage*
Education classification code	*43431*
Type of the study programme	
Name of the study programme director	*Agnese*
Surname of the study programme director	*Kukela*
E-mail of the study programme director	*agnese.kukela@lu.lv*
Title of the study programme director	*Dr.geol.*
Phone of the study programme director	
Goal of the study programme	*To provide the education of interdisciplinary study content in the field of cultural and environmental heritage rooted in environmental sciences for the preparation of students and graduates of the programme for research activity, professional activity and lifelong learning, creating prerequisites and promote the development of cultural and environmental heritage as a direction of scientific research in Latvia.*

Tasks of the study programme	*1. To prepare academically educated specialists for professional and research identification, evaluation, investigation and preservation of objects of cultural and environmental heritage, as well as participation in monitoring the sustainability of cultural and environmental heritage.* *2. To create prerequisites for identifying and classifying the cultural and environmental heritage field in regulatory documents, to reflect the diversity and social importance of the content of this sector.* *3. To create a common study and research environment for cooperation with educational and cultural institutions, institutions and professional organizations representing the sector of cultural and environmental heritage and environmental protection.* *4. To involve in the learning process of the study content relevant contemporary digital documentation, research, data and information processing and communication technologies, in order to promote a comprehensive research of cultural and environmental heritage and the compatibility of the obtained information.* *5. To promote the recognition of common practical or theoretical problems related to the organizations and cultural institutions of the field and involvement of cultural heritage specialists into international academic and professional areas.* *6. To establish and constantly maintain during the study process the cooperation of the study programme with secondary professional and higher education study programmes of cultural education branches.* *7. To create a complex understanding of the fundamental theoretical and practical manifestations in the field of cultural and environmental heritage, ensuring the full-fledged development of the individual abilities of students and the ability to continue research-oriented studies in the Master's study cycle.*

Results of the study programme	*Knowledge:* *1. Understands the basic principles of the environmental sciences' theories, regularities, types of natural and environmental resources and orients in the problems of ecology and material science basics.* *2. Knows the basic sets of facts, ideas and findings of art history, environmental history and social history in the context of cultural heritage theories.* *3. Knows the requirements for evaluating and documenting cultural and environmental heritage and the basic methods of their visualization.* *Skills:* *4. Explains the properties and values of objects of environmental science and cultural heritage; defines the main research problems on a global, regional and local scale.* *5. Applies stylistically and informatively appropriate forms of substantive and visual expression in solving research questions.* *6. Is able perform a to public speech and reasoned discussion on issues of environmental science and the protection of cultural and environmental heritage in an audience of both specialists and non-specialists and is able to decide on the ways of solving cultural and environmental issues in changing natural and social environment conditions.* *Competence:* *7. Identifies and critically analyses the issues of sustainability of the resources related to natural, cultural and environmental heritage and environmental monitoring and revitalization questions in the context of natural and urban environment objects, performing a general assessment of the physical condition of natural and cultural and environmental objects.* *8. Orients in the national and international regulation of the cultural heritage field and analyses the interrelationships of facts, data and observations by working independently at information repositories, cultural heritage and environmental heritage sites, and social institutions.* *9. Initiates and engages in the research-oriented projects using imaging technologies and methods in accordance with the purpose of the research or professional activity.*
Final examination upon the completion of the study programme	*Bachelor's thesis*

Study programme forms

Full time studies - 4 years - latvian

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*160*

Admission requirements (in English)	*Secondary education*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Bachelor’s degree of Natural Sciences in Environmental Science*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
University of Latvia	RĪGA	RAIŅA BULVĀRIS 19, CENTRA RAJONS, RĪGA, LV-1050

Full time studies - 4 years - english

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*english*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education; English language proficiency at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Bachelor’s degree of Natural Sciences in Environmental Science*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
University of Latvia	RĪGA	RAIŅA BULVĀRIS 19, CENTRA RAJONS, RĪGA, LV-1050

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

Since the licensing of the academic bachelor study program "Research and protection of Cultural and Environmental Heritage" on August 24, 2022, the only changes that have taken place in the parameters characterizing the study program affect the sample of the diploma supplement, as changes have been made to the names of some study courses and in the number of credits. Changes in the study plan of the study program were made for two reasons: 1) following the recommendations of the experts of the licensing commission, accordingly reducing the number of study courses by combining them; 2) taking into account the expected transition to the ECTS credit system, the study plan was corrected in such a way as to reduce the study course with an odd number of credit points, but still maintain the total amount of the program at 160 CP / 240 ECTS. Clarifications, additions and error corrections have also been made in the study course descriptions. These additions and corrections to the descriptions of study courses were also made for two reasons: 1) combining study courses and changing their CP amounts due to the reasons described above; 2) following the instructions of the Licensing Commission experts regarding the fact that errors and inaccuracies were found in the descriptions of some studies in English. This was also prevented. In total, changes have been made to the descriptions of 18 study courses.

The most significant changes that affect the parameters of the study program, following the decision made during the process of inclusion in the accredited study direction on October 25th, 2023, is the change of the name of the study program, replacing the name of the study program at licensing - "Cultural and Environmental Heritage" with the new name "Research and protection of Cultural and Environmental Heritage". Current report includes the new name of the study program.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

Based on AIC 25.10.2023. decision no. 2023/12-SPI, the academic bachelor's study program "Research and protection of Cultural and Environmental Heritage" was included in the UL accredited study field "Environmental protection", as far as the study program fully complies with all three Cabinet of Ministers' Regulations no. 793 to the requirements specified in point 16 and applicable to the Study Program (point 8 of the decision). Experts have rated the Study Program as "good".

The study programme has been developed based on the LU Development Action and tasks objective referred to in the "LU Strategy 2021-2027", which focuses on unique study offers and high competitiveness of graduates, promoting study development by providing international and interdisciplinary study programmes. The result of this study programme shall also take place by Sub-action point 2.10 of the implementing provisions of the first and second round of project application selection of Cabinet Regulation No. 27 of 9 January 2018, the specific support objective 8.2.1 of the operational programme "Growth and Employment" "reduce fragmentation of study programmes and strengthen the sharing of resources" and Sub-action point 2.2 of the Rules of Procedure of the Commission for evaluation of study programmes Development and consolidation plans of the Ministry of Education and Science (Meeting protocol No. 6 of 30 November 2018).

According to Latvia's education classification, the study programme's code is 43431.

Students acquire knowledge, skills and competencies relevant to level 6 of the European Qualifications Framework (ECI) and the Latvian Qualifications Framework (LCI).

Following the regulations regarding the State academic education standard, the study programme amount to 160 CP (240 ECTS) and the duration of studies is four years (eight semesters; in each semester, students acquire 20 CP (30 ECTS)).

Environmental science is evolving in the field of contact between several sciences, such as natural sciences, social sciences and humanities, focusing on studying the interaction between the man-made environment and the natural environment to ensure the sustainable coexistence of the environment and society. The extension of the scope of environmental sciences in the direction of cultural heritage is justified, first, by the fact that the content of environmental sciences deals with research and conservation issues relating to natural and urban sites. As these themes are also part of the content of studies in the humanities, social sciences and engineering (architecture), overlapping of similar themes with the cultural heritage sector is emerging, creating a common range of research and academic presentation themes that ensure the linking of the objectives, tasks and study results of the study programme with the objectives, tasks and study results of the study direction. Secondly, it is important that cultural heritage issues be viewed more broadly than with an individual site, also taking into account the site's circumstances, which potentially affect the sustainability of the site's existence. The Faro Convention (Convention on the value of cultural Heritage for society, 2005) also emphasises this interdisciplinary treatment. Thirdly, recognising that cultural heritage is a consciously tended and maintained part of the living space rather than a set of individual artefacts is no less significant.

The title of the study programme, "Research and protection of Cultural and Environmental Heritage", appropriately characterises the complex content of the programme, in which environmental research and conservation issues are acquired alternately with art history, humanities, visual art and the foundations of restoration sciences. This study programme has been developed as a set of interdisciplinary knowledge that combines knowledge of different origins, positioning environmental sciences as "core knowledge". It is environmental sciences that define the uniqueness of the study programme and play a codifying role in the content structure of the programme since the involvement of these elements of knowledge, first, broadens in principle the scope of cultural heritage themes by giving content more significant contact with natural sciences and contemporary research technologies and, second, by enabling the identification of this study programme as science-based and research-oriented studies. The study programme “Research and protection of Cultural and Environmental Heritage” was created following the current Cabinet of Ministers’ Regulations No. 240 on the academic education standard, observing the condition of Paragraph 5 thereof regarding the achievement of "scientifically justified results of studies" and also the characterisation of the orientation of the content of the mandatory and restricted part of

the programme specified in Paragraph 10. Following these Regulations, the proportion of environmental science study courses in the programme's content justifies the degree title to be awarded at the end of the study programme "Research and protection of Cultural and Environmental Heritage" is “Bachelor’s degree of Natural Sciences in Environmental Science”.

The problem that has not yet been solved is the fact that Cabinet of Ministers Regulation No. 322 on the classification of education of Latvia at the level of the cultural heritage or cultural environment heritage does not define the thematic areas of education or the group of educational programmes, even though restoration has been taught for a long time in secondary cultural education institutions and also in the first level vocational higher education programme. Moreover, since 2020, the Latvian Academy of Culture has licensed the Master's study programme "Cultural Heritage Administration and Communication", so the UL Bachelor's programme " Research and protection of Cultural and Environmental Heritage" is currently the only independent study programme in the country that provides students with the possibility of continuity and continuity of the study process.

The specified duration of the study programme (4 full-time study years) is justified by the conclusion that a shorter period cannot ensure the acquisition of the type of interdisciplinary content planned for this study programme. Both a 3-year and 3.5-year model of the program were tested during the design of the program. When discussing the potential capacity of the content of these reduced study time models, significant deficiencies were identified that cannot be compensated for in a shorter study period.

In particular, into account should be taken the fact that there is currently no direct follow-up to the study programme, which would allow for the transfer of part of the content related to environmental science research into the Master's study cycle. In the further development of the content of cultural studies, a review of the duration of the programme is possible, provided that a master's programme of 2 years is established and approved, the content of which enables the content of the "Research and protection of Cultural and Environmental Heritage" study programme to be viewed as preparation for sectoral studies at the Master's level.

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

The justification for the necessity of the study programme consists of the need for more cross-sectoral study programmes rooted in the ideas and processes of the cultural heritage sector in higher education of Latvia and an underdeveloped cross-sectoral research environment. The creation of cultural heritage study content within the framework of environmental sciences is in line with the recommendations of the European Union and Faro Convention (2005), in which cultural values, including natural or urban sites or groups of sites, are recommended to be defined “expanded and interdisciplinary”.

Cultural Heritage studies have become an independent part of European and world universities' institutional structure, study content, and research interests. Cultural Heritage study programmes shall ensure the inheritance of research and professional experience and corroborate the research methods, findings and facts examined in the sector. The involvement of professional organisations in the work of universities is essential, as the professionals in the sector provide direct information on the processes and current needs in the sector. In parallel with the organisation of studies and research, higher education institutions are being formed to exchange experience and determine

further activity directions. The lack of cultural heritage studies in Latvia indicates an indiscriminate projection of the higher education area against at least what is happening in the higher education area of the European Union. This situation delays the development of cross-sectoral research directions, restricts the preparation of new specialists for activities in the cultural heritage sector, and degrades the prestige of the cultural heritage sector in the country.

The development of the study programme in UL, combining environmental sciences, chemistry, geology, humanities and arts competencies, is in line with the recommendation of the OECD Frascati Manual in its 2015 Guidelines on the compliance of “Conservation and restoration” with the concept of “Research and Development” (OECD, 2015), Frascati Manual 2015: Guidelines for collecting and Reporting Data on Research and Experimental Development, the measurement of Scientific, technological and Innovation activities, OECD Publishing, Paris. Research on the Arts. page 65: “As far as conservation and conservation activities are concerned (...), it is recommended to identify the providers of such technical services as R & D performers (employing researchers, publishing scientific works, etc.).” Research and technology acquisition studies provided by environmental science courses create conditions corresponding to STEM (Science, Technology, Engineering, maths) programme group requirements, substantially complementing the knowledge provided by cultural heritage sector, humanities and arts courses.

Cultural heritage issues have been addressed in EU countries since the adoption of the European Cultural Convention in Paris on 19 December 1954. Article 2 underlines the need for cultural heritage studies in European Member States.

Study programmes related to cultural heritage content are implemented in virtually all UNESCO (United Nations Educational, Scientific and Cultural Organisation) Member States, ensuring the training of specialists for the local labour market and the training of researchers for scientific activities.

In the nearby region, undergraduate studies in the cultural heritage sector are offered in Lithuania (Vilnius Academy of Art, Kaunas Technological Institute) and Estonia (Estonian Academy of Art). All Nordic countries carry out cultural heritage studies, such as the University of Oslo in Norway, the University of Gothenburg in Sweden, the Royal Academy of Art of Denmark, Finland at the University of Jyväskylä and the University of Metropolia. In Poland, cultural heritage expertise can be acquired at three universities: the University of Warsaw, the University of Krakow and the University of Toruna. In Europe, cultural heritage or restoration and conservation study programmes are carried out in Austria, Belgium, the Czech Republic, France, Greece, Ireland, Italy, Croatia, Malta, the Netherlands, Portugal, Spain, Switzerland, Germany, and Hungary.

Certain Bachelor’s study programmes in the direction of cultural heritage sciences are not being implemented in the higher education area of Latvia. The only independent study programme of the cultural heritage sector – level 1 higher vocational education programme – is implemented at Riga Building College, ensuring the restaurateur's 4^{th} level of professional qualification.

At the level of the Bachelor and Master at the Latvian Academy of Art (hereinafter - LMA), restoration is acquired as a sub-sector of Art Science, but within the framework of the Art History and theory sub-programme several themes of the cultural heritage sector are acquired. LU learns cultural heritage themes at Master level within the framework of the Master of History Sciences programme as a module of specialisation at Riga Technical University as separate study courses in the Professional Master's programme “Architecture” and in the academic Master's programme “Applied Chemistry”. Since 2020, the Latvian Academy of Culture has been implementing the Master's study programme “Cultural Heritage Administration and Communication” in cooperation with Vidzeme University of Applied Sciences.

At the level of secondary special education, restoration is taught at Riga Building College, Rezekne High School of Art, PIKC National High School of Art, Zalenieki Commercial and positions Secondary School. Although the 2018 study of the Latvian National Centre for Culture Education (hereinafter – LNKC) indicates that the demand for this type of education is high, the number of people who have completed restoration specialisation and who have acquired the qualification of a restaurateur-technician is low: 5 in 2018 and 6 graduates in 2019. It should be noted that this study programme is not narrowly focused on the preparation of restoration specialists and provides a basic understanding of the principles and methods of restoration and preventive preservation within the framework of cultural heritage courses.

Every year, approximately 465 young people graduate from schools of the Latvian cultural education system (LNKC data in the last five years), of which 70% or 325 graduates continue education related to the sector (including studies abroad). As a leading institution of higher education in the thematic field of education, the LMA welcomed 138 students into the primary study programme in 2021. This points to around 140 young people educated in arts and cultural subjects, which is a significant student potential.

In the last two years, the number of graduates of subordinate schools of the Ministry of Culture (hereinafter - KM) who continue to study in the sector has averaged 58%. The slight decrease in the number of continuing education compared to previous years (around 60% before 2020) could be due to the impact of the COVID-19 pandemic. Overall, 69% of graduates of vocational education institutions from the 2021 KM subordinate study in different sectors in Latvia and abroad (Source of information: LNKC data on VOCATIONAL training institutions subordinate to km).

Secondary special education of Latvia (cultural education which provides level 3 professional qualification) creates a significantly large number of young people potentially prepared for cultural heritage studies: 474 graduates in 2019, 520 in 2020, and 644 in 2021 (data from the Latvian Centre for National Culture). This includes young people in positions related to visual arts, design and art content, for whom adapting previous education to studies in a cultural heritage study programme would not give rise to any difficulties of principle.

Since the content of the current study program does not cover all issues related to the identification, exploration and preservation of cultural heritage, it should be allowed that this study programme may become a reference programme for a new line of academic content, which will create a set of specialised (specific problems of the cultural heritage sector) study programmes, the implementation of which will involve several institutions of higher education. The rationale for such development is the content diversity of the cultural heritage sector, which covers both tangible and intangible cultural objects, as well as natural environment and human-created environmental heritage objects. Heritage know-how extends to a number of sciences (such as environmental sciences, architecture and construction, engineering, chemistry, history, archaeology, and anthropology), arts in sub-sectors (such as sculpture, ceramics, painting, textile art, and design) and positions (such as restoration directions, folk art posts) that currently function as separate professions outside the wider context of the heritage industry.

Potential employers and organisations representing the cultural heritage sector have confirmed the demand for fully educated specialists in the labour market (data from the National Cultural Centre of Latvia). The cultural heritage sector in Latvia requires universally/extensively educated specialists who can understand and co-ordinate the issues of cultural heritage sites and environmental preservation. The cross-sectoral orientation of the study programme needs graduates of the programme to be competent in a number of fields of knowledge, including environmental sciences, heritage sciences, chemistry, visual arts, history and philosophy. The sciences that make up the programme's basic content structure determine the programme's

duration – 4 years.

The concept of “cultural heritage” and “cultural environment” is included in the “Cultural Policy Guidelines 2021-2027” prepared by the Ministry of Culture (data of the National Cultural Centre of Latvia). This document clarifies the concepts of “cultural heritage” and “cultural environment” (1) as part of Latvia's unique cultural values (p. 5) and (2) as a prerequisite for the development of sustainability resulting from the professional development of cultural sub-sectors (p. 23). The “Cultural Heritage” study programme is fully consistent with this view on the development of cultural sub-sectors, as it broadens the understanding of the cultural heritage sector by attracting the competencies of environmental sciences and chemistry sciences.

Since the implementation of the study program was started only in academic year 2022/2023, there are no graduates yet.

Despite the fact that the study and study programmes related to the acquisition of the “Cultural Heritage” are not systemically developed in the Latvian education system (there is a lack of flexible and successive offers of educational programmes, moving from the level of secondary education to the level of higher education), statistics on the interests of study applicants in the LMA show that in 2021 the largest competition (3.5 applications to the study place) has been directly in the restoration speciality. This, given the generally passive formation of the public image of the restoration sub-sector and the very low proportion of study places in the secondary school-level cultural education system, shows a good reputation for the “Cultural Heritage” sub-sector.

Currently, a significant obstacle to the development of the study programme is the need to define cultural heritage in the education classification of the LR. In international classifications, the term “Cultural Heritage” is used, and its introduction in the regulations of the Cabinet of Ministers on the classification of education would be a logical and targeted action.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

Although in the licensing report, it was planned that 35 students would start their studies in the first year of the study programme, only 11 students have submitted the documents for entering this study programme. At the beginning of the academic year, 8 students were matriculated. Budget places were not allocated for the study programme for this academic year; therefore, all students started their studies for a tuition fee. Considering that the decision on the license granting was received only on August 24, 2022, in the summer months, before the time when students usually choose potential study programmes and universities implement active measures to promote their study programs, the UL could not start special activities to promote the new study programme as the deadline for receiving the license was unknown at that time.

It is noteworthy that already in the first semester of the study programme implementation, potential new students showed great interest in the study programme. After receiving the license, opinion articles about the opportunities to study in this study programme were disseminated on the UL website and public media internet platforms. Also, the new study programme was introduced in two broadcasts, “Known in the Unknown” at “Latvijas Radio 1” (Latvia’s national public-service radio, channel No.1), mentioning both the uniqueness of the study programme and its novelty.

Informative activities and promotion of the study programme also continue now. As proved by the promotion activities of the study programme at the study festival for pupils “L’Universs” organized by the UL, which took place on March 3-4, 2023, both pupils, as well as parents and teachers who attended this event, were surprised about such a truly unique study programme’s creation and availability in Latvia, and their support with quotes about the need for such a study programme was unambiguous.

At the time of the report’s preparation, only the 1st semester (autumn) of this study programme’s academic year has finished. 7 students successfully passed the session with good and excellent results, but 1 student has not passed the session due to stopping attending the lectures for unknown reasons.

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The study programme’s content is designed in accordance with the Action Programme’s “Growth and Employment” specific support goal 8.2.1. undergone Project “Creation of Internationally Competitive Study Programmes Promoting the Development of the National Economy of Latvia in the University of Latvia”, defining the requirements set out in the Law on Higher Education Institutions of the RL and Regulations on the Study Programmes and Continuing Education Programmes at the UL (Senate Decision No.102 on April 24, 2017) for academic bachelor’s programmes.

The mandatory part of the study programme includes 43 study courses (including a Bachelor’s thesis, two course works and a practice course) with 116 CP (174 ECTS) in total, including study courses in accordance with the requirements of Civil Protection and Disaster Management Law and Environmental Protection Law. The number of CP of the limited optional part is 38, this part contains 15 study courses. In addition, the programme has a free choice part of 6 CP (9 ECTS). At the end of the programme, students work out a Bachelor’s thesis corresponding to 10 CP (15 ECTS).

The model of interdisciplinary content of the study programme has no direct analogues either in

Latvia or in the higher education space of the Baltic region. The interdisciplinary orientation of the study programme is characterized by the name of the programme, which includes the key word ‘environment’ characteristic to environmental sciences and the words ‘culture’ and ‘heritage’ characterizing humanities and arts.

The implementation of the study programme is coordinated by the programme director. The quality of ensuring the learning of the study content is assessed by the study programme’s Council (hereinafter – the Council), which includes representatives of the structural units of the UL involved in the implementation of the programme, i.e., FGES, Faculty of History and Philosophy (hereinafter – FHP), Faculty of Humanities (hereinafter – FH) and a representative of the AAL. A specialist-expert in the field of cultural heritage may be involved in the work of the programme’s Council as a consultant. The programme’s Council will be established after the study programmes accreditation.

The Council discusses and evaluates issues related to the organization of the study process, study results and the information provided by student surveys. The task of the Council includes also discussing and summarizing the observations and opinions of the faculties involved in the implementation of the programme. The Council prepares an annual self-assessment report for the Department of Environmental Sciences and the Council of the FGES.

The description and interconnection of the scientific fields included in the content of the study programme

Environmental science and cultural and environmental heritage

Environmental science is an interdisciplinary scientific field that develops by interacting among social sciences, humanities and natural sciences in order to study the interaction between man and the natural environment, to ensure the sustainable existence of the environment and society. Important subfields of environmental science are environmental management, environmental philosophy and ethics, environmental economics, environmental policy, environmental communication, environmental engineering, sustainability science, nature protection.

The subfields are united by a common ideological platform – the paradigm of environmental science, which means that research results must ensure the existence of humanity, its heritage, including cultural heritage. The main tasks of environmental science include:

1) Conservation (preservation) of resources, which means ensuring the availability of resources necessary for the development of humanity not only for existing but also for future generations. Within the framework of this task, the preservation of the existing material cultural heritage is of priority importance;

2) Balanced development of the human-created environment, including the cultural environment and the natural environment, which is connected, for example, with the need to preserve the traditional landscape, cultural heritage objects, optimize the use of territories;

3) Ensuring acceptable environmental quality for the development of society by restoring the degraded environment;

4) Ensuring social equality;

5) Ensuring public participation. As an example of the scope of the issues indicated above can be mentioned a monograph “Environmental protection and sustainable development” (eds. M.Kļaviņš, J.Zaļoksnis, V.L.Filho) in which content of the chapter “Cultural environment of Latvia” (prepared by prof. O.Spārītis) is an essential part.

The creation of the study programme provides a significant contribution to the solution of these tasks, while at the same time expanding the range of environmental studies. Several important

projects have been and still are being carried out in the sector of environment and cultural environment interaction at the UL, for example, on the interaction of environment and cultural environment in Engure county, the development of the cultural landscape of Burtnieki county, the "ForThem", project, the project of Latvian Science Council "Competing natural discourses in Latvia and ecological solidarity as a consensus formation strategy". Doctoral theses have been developed on ecotourism in protected natural areas (E.Leitis, 2012), the importance of public science in achieving sustainable development tasks (B.Prūse, 2020) and many Bachelor's and Master's theses.

Description of the role of the humanities

The set of courses in humanities of the study programme provides the necessary knowledge for cultural and environmental heritage competencies in the directions of art and cultural history, philosophy, ethics, mythology, ethnography and language studies. The courses in humanities within the study programme are provided by the FHP and the HF of the UL; lecturers from the AAL and guest lecturers provide the content of humanities related to art history, restoration theory and visual arts.

The knowledge in humanities is necessary for the graduates of the study programme to form (jointly with the knowledge in environmental sciences, chemical sciences and visual arts), firstly, a fundamental understanding of the overall picture of cultural heritage issues and, secondly, to explain complicated cultural heritage issues in four essential aspects such as (1) meaning associated with historical memory, (2) historical facts, (3) property rights and (4) as management and protection attitudes.

An important role of humanities courses is related to identifying the truthfulness and ethical issues of assessing the cultural heritage objects and understanding the interrelationships of social relations, and attributing management attitudes that do not violate the principles of a gentle attitude towards cultural and environmental heritage.

The content and research methods of cultural and environmental heritage studies with an orientation in humanities ensure the competitiveness of specialists who, grounded in the guidelines and ideas of historical, philosophical and ethical issues, are critically thinking and are able to perform complex analyses of social and cultural problems as well as being able to participate in the research of cultural objects and the cultural environment and opens opportunities to continue education in master's study programmes in humanities.

Studies of languages, texts and cultures form analytical thinking, the ability to critically and objectively evaluate facts and processes locally and globally. In contact with foreign languages, the mastery of the native language and understanding of the nature of things and phenomena are improved, learning of which develops tolerance and the ability to stand up for one's values and explain them to others in a reasoned, convincing manner.

Language studies have a complementary role in the study programme, as they improve the ability to formulate opinions and communication skills and create prerequisites for researching historical documents and materials in Latvian and foreign information repositories. The function of language studies is flexible to support the interests of the student groups (according to needed and considering the different language knowledge acquired at the secondary education level) in learning a particular foreign language.

The subfield of art history and restoration

The lecturers of the AAL and guest lecturers provide courses and thematic directions related to the disciplines of art history, theory and restoration, thus, implementing its role in creating and strengthening the direction of cultural and environmental heritage knowledge in the higher

education space of Latvia.

In cooperation with the Institute of Art History at the AAL, the lecturers of the art history and theory subfield of the AAL are preparing publications for the fundamental collection of articles “Latvijas mākslas vēsture” (“The History of Latvian Art”), which is being published since 2003 aiming to introduce the branch specialists and other interested parties in the cultural society of Latvia and abroad with the latest achievements in the field of art history and theory. The journal’s articles are available internationally at the *Central and Eastern European Online Library (CEEOL)*. The collection of articles is indexed in the following databases: *Central European Journal of Social Sciences and Humanities (CEJSH)* and *Kunstbibliotheken-Fachverbund Florenz-München-Rom (Kubikat)*, as well as in *Scopus*.

The continuance of the Institute of Art History of the AAL is justified by the need for fundamental research on the visual arts and architecture of Latvia and related regions and improving art science theories and methodologies. The strategic goal of the institute involves identifying, interpreting and popularizing the visual arts phenomena of Latvia’s oldest and most recent periods, using traditional forms of publication (articles in proceedings, magazines, books, dissertations, papers at scientific conferences) and the opportunities provided by the latest technologies (Internet, electronic resources); to apply research facilities both in the implementation of AAL study programmes and the cooperation with other research and educational institutions in Latvia and abroad.

The role of the content of art history and theory in the study programme is to draw general ideas about the history of Western art and architecture in the context of different eras and directions, the most significant examples and the overall stylistic development over the history. The set of art history topics envisaged in the study programme corresponds to the basic knowledge of art history, which provides opportunities for further in-depth learning of particular topics.

The restoration subfield at the AAL functions since 1924, and certified specialists of the restoration field (such as restorers of portrait paintings and graphics) are involved in its activities. Accordingly, the AAL provides knowledge and practice-based understanding in restoring artworks for this study programme. Students acquiring restoration speciality at the AAL learn restoration skills by working with actual art objects under the supervision of specialists of the field, proving a high degree of responsibility and discipline regarding the content of studies, the methods applied and quality monitoring.

In the context of the content of the study programme, the restoration subfield provides insight into the types, techniques and methods of restoration. Students of the study programme are not expected to apply for a restorer’s qualification – the content orientation of the courses related to restoration skills mainly provides an introduction to the practical developments in the field of restoration – the basic methods of assessing the condition of artefacts, acquainting the technologies ensuring the processes and learning practical copying skills by studying technical types of artistic expressions. The restoration study course also includes the history of the restoration field, topics of the history of colour technologies and current issues that form ideas about the causes of the actual condition of artworks and possible types and methods of restoration.

Description of visual arts disciplines

Topics related to visual arts provide insight into the basic forms of expression, techniques and theoretical concepts of the culture of representation. Visual art competencies contribute to creating the content of the cultural environment by adding lasting ideas about the object of cultural heritage and formal qualities and aesthetic values of the environment. The role of visual art disciplines within the framework of cultural and environmental heritage studies has to be evaluated in four aspects, firstly, as methodically well-grounded abilities in observation and visual evaluation;

secondly, as the skills to create images with precisely selected means of visual expression, techniques and methods that visually communicate the point of view of the image creator, thirdly, as an understanding of the types and opportunities of visual expression based on practical experience, fourthly, as a deeper understanding of the formal characteristics of styles and genres of art and architecture.

The part of the programme's content planned for visual media studies is relatively small; however, it ensures the formation of a comprehensive understanding of the forms and essential concepts of media expression. The programme includes the basic disciplines of visual arts – drawing, painting and figuration – called 'media studies' because of the decision to prevent them from being identified with the so-called 'creative self-expression'. The overarching goal of the cultural heritage field, as stated "to preserve cultural heritage as an important factor in the quality of human life – to identify, protect and include the tangible cultural heritage in modern life, to promote the understanding of cultural and historical values in society" determines the attitude that 'media studies' is an instrument promoting complete understanding on aspects of cultural heritage values and creates prerequisites for high-quality communication with means of visual expression.

Learning the forms of visual art expression within the study programme is focused on the interaction of practical lessons and theoretical lectures, creating a unified base of practical skills, theoretical concepts and terms for creating clear and effective academic communication. A bit larger number of CPs is planned for drawing, compared to painting and modelling. Such a choice is justified by the consideration that drawing is an efficient, operative and technically simple instrument of visual communication; moreover, the forms of drawing expression allow a relatively simple transition from analogue to digital format and match the technical image with the observed and imagined picture.

From the point of view of the content of cultural and environmental heritage studies, visual art skills contribute to the understanding of the visual characteristics and values of objects and space of cultural heritage. Basic knowledge in the field of visual media is necessary for methodological and rational evaluation of objects and space of the cultural environment and visualization of observations with analogue and digital technologies.

Structure of the programme

The structure of the study programme consists of study modules and study courses.

The basic structure of the programme consists of **four thematic modules**:

1. Environmental Sciences and Cultural Heritage.
2. Environmental Sciences.
3. Humanities and Arts.
4. Theory and Methods of Cultural and Environmental heritage.

A detailed description of the study courses included in each thematic module and the amount of their credit points can be found in the full-time study plan of the Study Programme (Annex 8).

The modular structure of the study programme organizes the courses into groups of thematically related knowledge, thus improving the transparency of the interdisciplinary content of the programme as a whole and stimulating the mutual complementation of topics within the module competencies. It is precisely in the division of the study program into thematic modules, as well as the creation of interdisciplinary and multifaceted study program content, that ensures the achievement of the goal of the study program, since complex knowledge of the field of cultural and environmental heritage and professional activity in this field requires skills, knowledge and competences provided by both the fields of environmental sciences and humanities, which are

included in the four thematic modules of the study program.

Taking into account that the implementation of the study program involves not only UL teaching staff from various faculties and fields of science, but also specialists in the field of cultural and environmental heritage, who deal with issues related to the research and protection of cultural and environmental heritage on a daily basis, the actualization of the study program proceeds naturally, linking the theoretical knowledge with examples from professional practice. Also, suggestions and proposals for the updating of study courses are expressed in surveys of students and teaching staff, the results of which are taken into account when planning the updating of the content of the study program.

The thematic modules' names reflect the programme's interdisciplinary nature, indicating the main fields of knowledge and research directions. The names of the thematic modules are heterogeneous because 'Environmental Sciences' are classified as an educational programme group, but "Humanities and Arts" as an educational thematic group. The term 'cultural environment' is used in state planning documents to denote 'both material formations and intangible spiritual values'. The name of the thematic module "Environmental Sciences and Cultural and Environmental Heritage" refers to the set of programme content in which environmental sciences explain issues related to the study of cultural and environmental heritage. In the programme, this module is added to the content section of environmental sciences because the content topics and methods that interpret cultural heritage issues correspond to the orientation of environmental sciences in a broader sense, including, for example, chemistry and geoarchaeology topics. The name of the thematic module, "Theory and Methods of Cultural and Environmental Heritage", corresponds to the academic and professional topics of cultural and environmental heritage knowledge and practically applicable methods included in the programme's content.

The study courses of the study programme can be both an independent "outline of the system of knowledge, skills and competence, which has defined study results, for the achievement of which credit points are awarded" (article 1, clause 11 of the Law on Higher Education Institutions[1]), and also a part of a study module. The programme includes 58 study courses, of which the "Environmental Sciences and Cultural and Environmental Heritage" module includes 7 courses, the "Environmental Sciences" module includes 9 courses, the "Humanities and Arts" module includes 14 courses, the "Theory and Methods of Cultural and Environmental Heritage" module includes 15 courses (see Table 4). The rest of the study courses are grouped in the "General Education Courses" module and include both - foreign language and chemical and environmental sciences courses, as well as course works, an academic practice course and a bachelor's thesis.

The bachelor's thesis is defined as a separate part of the programme.

Annotation of the objectives and content of thematic modules

"Environmental Sciences". The objective of the thematic module: to provide essential competencies in the field of environmental sciences.

Annotation of the thematic module: The courses' content of the module presents the ideas, operational methods and research problems of environmental sciences in a broad sense, including topics from chemical sciences and earth sciences. The topics of the courses included in the module generally define the basic types of knowledge related to the content of environmental sciences and form part of the proportion of environmental sciences in the study programme.

"Environmental Sciences and Cultural Heritage". The objective of the thematic module: to contextualize cultural and environmental heritage topics from the perspective of environmental sciences.

Annotation of the thematic module: The courses' content of the module outlines the role of environmental sciences in the recognition, research and preservation of cultural and environmental heritage. Topics of the courses provide insight into the planning and management of research and professionally oriented projects. The topics of the module form part of the proportion of environmental sciences in the study programme.

"Theory and Methods of Cultural and Environmental Heritage". The objective of the thematic module: to ensure the accessibility of basic information about the characteristics and functions of the cultural and environmental heritage branch.

Annotation of the thematic module: The courses' content of the module provides information on the operating principles of the cultural and environmental heritage field, sectoral guidelines, legal framework and methods of preservation of cultural heritage objects. The content of the courses included in the module focuses on gaining an understanding of the directions of activity of the cultural and environmental heritage field; therefore, a significant part of the module's content consists of acquiring the methods of restoration of cultural and environmental objects, analysis of visual culture issues and topics related to the learning of visual expression.

"Humanities and Arts". The objective of the thematic module: to provide a set of knowledge in humanities necessary for understanding cultural and environmental heritage issues.

Annotation of the thematic module: The course's content of the module provides a broad context of knowledge in humanities for the study programme in the fields of philosophy, language studies, history, cultural history and, specifically – art history. The role of humanities in the programme is to build the foundations for general intelligence – the ability to understand the causal relationships of cultural and historical facts, to navigate the meanings of visual and written signs, as well as the essential ability to understand foreign language texts.

The study results achievable by learning the thematic study modules are summarized in Annex 37P.

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Both oral, written and combined study and evaluation methods were used during the acquisition of

study courses and examinations.

Studies use various methods for acquiring and strengthening knowledge, such as introductory, interactive, summary, and problem-oriented lectures. For the individual lectures, trainees, and professionals from different institutions are invited to study courses to promote unity of theory and practice. Practical tasks, seminars, individual, paired and group work, discussions and project development, and training tours to industry organisations are widely used. Employers are involved in implementing and improving study courses (Some seminars are invited to be conducted, often classes are organised as visits to workplaces for the exchange of experience, etc.).

To promote the development of student research competence, students in successive courses can analyse and study the problems of interest to them in the sector. Senior students are linked to managing the latest course study process (peer teaching-learning).

Seminars in study courses promote students' speaking, presenting and discussion skills.

For students to achieve study results – to acquire and strengthen knowledge skills and develop competence – the study process is dominated by methods in which student activity is essential. The study process uses methods that facilitate student communication in performing study assignments solving real industry challenges by modelling situations.

The physical environment of studios is also gradually changing: audiences are easily transformed for group work, and individual work, and students can use digital technologies. Doctors mostly use methods that encourage student active participation, critical thinking and reflexes. The e-study environment will be used in the study process and to promote independent studies. For each study course, an e-study environment (Moodle) has been established in which students have access to study materials, task descriptions and study materials related to course topics, and study tasks (tests, forums, seminars, conferences, etc.). All assessments of intermediate and final examinations of study courses shall be recorded based on the grading and available to students in the e-study environment.

The student-centric approach is followed when updating study programmes and courses, paying particular attention to the meaningful formulation of study results, thus promoting dialogue between doctors and students regarding study content, organisational forms and methods. Meanwhile, correctly worded study results encourage students' understanding and co-responsibility for their learning, self-evaluation and understanding of the assessment they receive. During the study process, doctors shall use methods, test forms and evaluation criteria conforming to the study objective and the planned study results.

Students receive support and feedback from doctors during the study process. The evaluation criteria for posting the tags have been made public in advance. The evaluation allows students to show how much they have achieved the expected study results.

Taking into account the principles of studying student-centric education, student mobility (recognition of study results) is promoted, and students engage in studies initiated by academic staff and social activities in society, thus gaining significant experience using the practice acquired in studying. In implementing the internal quality assurance policy, the study programme is implemented so that students are encouraged to actively participate in improving the study process. There are procedures and procedures for submitting student proposals and, resolving complaints, examining student appeals. The results of student surveys are evaluated and taken into account in the improvement of the study process. Students are asked to make recommendations for improving their curriculum and process in conversations with doctors and program directors.

The multiplication and adaptation of content acquisition methods to the needs of the inter-

disciplinary cultural heritage sector should be accepted as an undisputed necessity arising from the mutual impact of knowledge of the disciplines co-existing within the programme. This also applies to adapting technologies and research methods typical of fields in the methodology of adjacent disciplines or in the general tendency to develop a homogeneous view of problems.

The study methods are currently being adapted to the conditions that the LU resources and the Latvian Academy of Art, the cooperation partner of the study programme, can provide. LU has entered into a co-operation agreement with the Centre for Competence in Vocational Education "National High School of Art" to provide a qualitative study process with premises suitable for art classes. The NVM's methodological materials and objects are also partly used for the study process; however, shortly the performance of studies is planned in the auditoriums and workshops of the "House of Letters". Materials necessary for studies – research and display objects – will also be specially commissioned according to the content of course and module tasks.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

Since this study program is academic, it does not include students' practice in its classic comprehension. However, as part of the study program, students are provided with the opportunity to test the study the knowledge and competence acquired during the program, while working independently on site that possesses features of the cultural environment object, and comprehensively assess the characteristics of the object of environmental sciences, cultural heritage, humanities and arts.

The study program envisages an "Academic practice course" in the amount of 2 CP (3 ECTS), which is comparable for academic practice and, if necessary, the director of the study program will invite specialists from the field for the successful implementation of the practices.

The Study practice course provides students with the opportunity to test their knowledge, skills, and competences in the real-life situation. Practice course summarizes and synthesizes the information of the thematic element-groups for the realization of the concrete and practical study task. Students independently act in an environment of the chosen cultural heritage object to evaluate it from every point of view in connection with the environmental science, concepts of cultural heritage, and humanities and arts. Knowledge acquired during the Practice is summarized, synthesized and recorded in the Practice diary and reported to the tutor of the Practice.

The choice of the research object is made by the Students and it should be confirmed by the Tutor. When preparing the application for the subject of the internship course, the students are advised to contact the relevant owner of the cultural object or site, or the institution under whose supervision the object is located. Support for providing the Practice course was expressed by "Daugavpils Mark Rothko Art Center", "Pedvāle Art Park", the National Cultural Heritage board, the management of the Cultural and Historical Heritage Preservation Office and other institutions, whose representatives directly (by teaching courses) or indirectly (by participating in various measures to

promote the study program) have expressed their readiness to offer internship opportunities to students. These internships is also actively promoted by the director of the study program, by participating in various events, as well as by meeting with representatives of the industry organizations.

In the sense of cultural and environmental heritage information, the selection of objects or sites unknown and unstudied before, which have the potential of a cultural heritage object, is considered a priority, since the results of this study will ensure greater benefit for the public.

The aim of the course encompasses:

1. To organize and provide the preconditions for the testing of the theoretical knowledge.
2. Application of the practical skills of a student to a real situation of cultural environment object.
3. To strengthen the ability to perform the research in a methodical manner by collecting, classifying, and processing the information and data on the research object.
4. To strengthen the communication skills to interact with the collaboration partners and ability to communicate the problem with the target groups.

Students' activity during the implementation of the practice course is individual, however in some cases cooperation in small groups of students is also possible; such solutions before starting practice must be coordinated with the supervisor of the Practice course. The Practice course is planned in the 7th semester of the programme and thematically correlates with the Course-work „ Development of a Bachelor's Thesis topic project" and therefore supplements both the progress of the thesis and the possibility to test one's cognitions in practice.

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

At the time of the preparation of the report, the students' final theses have not yet been developed, as the study program is implemented only in the first academic year.

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the

respective examples.

The study programme is implemented at the FGES of the UL. Teaching staff for the specific field courses is attracted from the Faculty of Biology, the Faculty of Chemistry, the FHP, the FH, and the AAL. In implementing the programme, the secretary and study methodologist of the FGES of the UL is involved in providing students with the necessary services (e.g., student registration for studies and study courses and student assistance in arranging formalities with other structural units). The existing and planned number of newly admitted students allows for providing student service without hiring additional secretaries/methodologists. With Decision No.2-3/69 of the UL Senate (on May 31, 2021), *the Administration Statute of the University of Latvia* was approved, defining the functions, tasks, structure and basics of decision-making principles of the administration. Based on Paragraph 7 of this Statute, *the Administrative Regulations of the University of Latvia* (Order No.1-4/559 of the UL on November 15, 2021) have been issued, determining the work organization and competence of the UL management, officials, employees and departments.

The staff of structural units involved in implementing the study programme and their main tasks have not changed since the licensing report was prepared.

The study programme's essential methodological provision is still the developed teaching methodology and teaching aids available at the Direction of Environmental Protection Studies of the UL, including books, specific educational literature and developed laboratory work descriptions. The programme's implementation is also ensured by methodical training and teaching tools available at the FHP and the FH of the UL.

In material and technical terms, the implementation of the AAL programme is supported by access to the AAL library's resources. The part of the cultural heritage course of the programme is provided by the methodological tooling of the AAL lecturers and their experience gained in researching cultural objects.

Information provision

It is estimated that in 2023, 1.8 million units of information resources are available to the Library of the UL users. Following the UL's study and research infrastructure, the UL Library collection is located in 8 branch libraries and the Repository.

Compared to the data provided in the licensing report (regarding printed editions until December 31st, 2019), during the last three years, the collection of printed editions at the UL Library has been supplemented with 364 copies of 214 titles, which corresponds to the implementation of the study programme (Table 3.3.1.1.). The collection includes the most recent editions published between 2020 and 2022 (including the latter).

Table 3.3.1.1.

Literature available in the UL Library for the implementation of the bachelor's study programme "Cultural and Environmental Heritage"

Printed editions In the collection of the UL's Library, published from January 1, 2020, to December 31, 2022		
Type of editions (title/number of copies)	Distribution of editions by language (title/number of copies)	

Books	Series editions *periodicals*	Books	Series editions *periodicals*	Books	Series editions *periodicals*	Books	Series editions *periodicals*	
91/113	20/120	91/113	20/120	91/113	20/120	91/113	20/120	

Total: **214 titles in 364 copies**

Among the latest editions (books) can be mentioned:

- **Latvijas kultūras vēsture** [**Cultural History of Latvia**, *in Latvian*] / compiled by Ojārs Spārītis; authors: Zane Balčus, Dainis Bērziņš, Eva Eglāja-Kristsone, Pauls Daija, Eduards Dorofejevs [and 18 other authors]; scientific editors: Jana Dreimane, Anna Frīdenberga, Ieva Kalniņa [and 6 other editors]; literary editor: Sandra Skuja. Rīga: Jumava, [2021] 751 p.: facsimiles, illustrations, maps, plans, portraits. ISBN 9789934204791;
- **Muižas Latvijā: vēsture, arhitektūra, māksla: enciklopēdija [Manors in Latvia: History, Architecture, Art: Encyclopedia,** *in Latvian***]** / Mašnovskis, Vitolds et al. Rīga: DUE, 2018-2022. 5 volumes: illustrations, maps, plans, portraits. ISBN 9789934899911;
- **No futūrisma līdz mūsdienām [Manifesto. From Futurism to the Present,** *in Latvian, translated***]** / compiler and author of the foreword: Artis Ostups; scientific editor: Stella Pelše. Rīga: Neputns, [2021] 452 p.: illustrations. ISBN 9789934601095;
- **Kā saprast mākslu** [**How to Understand Art**, *in Latvian, translated*] / Benton, Rebold Janetta. [Rīga]: Jāņa Rozes apgāds, [2021] 175 p.: illustrations; (Basics of Art). ISBN 9789984238562;
- **Krāsu slepenā dzīve [The Secret Life of Colours,** *in Latvian, translated***]** / St. Clair, Kassia. Rīga: Zvaigzne ABC, [2021] 319, [1] p.: illustrations. ISBN 9789934095108;
- **Community Archives, Community Spaces: Heritage, Memory and Identity** / edited by Jeannette A. Bastian and Andrew Flinn. London: Facet Publishing, 2020. xxiv, 190 p.: illustrations. ISBN 9781783303502;

Therefore, it can be concluded that printed information resources in the UL Library's collection generally correspond to the implementation of the study programme in terms of their content and number.

Material and technical base

The study programme, as it was planned, is implemented at the UL FGES in the "Dabas māja" ("House of Nature") of the UL Academic Centre (further in the text – the UL-AC), which is located in Tornakalns', neighbourhood of Riga.

All the material and technical supporting base necessary for the study programme's implementation (described in detail in the licensing report) is still at the disposal of the lecturers and students of the study programme. It includes all the necessary facilities and equipment for the study of the physical properties of cultural and environmental materials, the study and characterization of physicochemical and chemical properties, as well as the study of biological persistence. In cooperation with the AAL, the UL provides the necessary conditions for practical studies. Also, for this purpose, on September 23, 2022, the UL concluded a Cooperation Agreement with the Jana Rozentala Art School - Vocational Education Competence Centre "The National High School of Arts" (further in the text – the NHSA), intending to strengthen the development, excellence and quality of cultural education and higher education in Latvia, including promoting the succession of education. According to the lecturers' suggestions and the students' wishes, in some cases, the study process is carried out in restoration workshops or laboratories. The study of arts disciplines at a strategic level is planned in the "Rakstu māja" ("House of Letters") of the UL-AC, but until the building is put into operation, the opportunities mentioned in the cooperation agreements

also provide the use of the AAL and the NHSA premises to ensure the study process.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

Study program funding

Program Revenue

For the provision of necessary funds for the implementation of the study program "Research and protection of Cultural and Environmental Heritage" at UL uses the tuition fees paid by the students. Overview of the planned number of students and tuition fees is shown in table 3.3.3.1. Sinc the study programme is being implemented the second semester only, the calculations use forecasts of the possible number of students for the next 3 academic years.

Table 3.3.3.1
Number of students and annual revenue of the program

Type of study	LV state funded	LV for tuition fee	EU/EEA/Swiss citizens* for tuition fee	Others** for tuition fee	Total	State subsidy	For tuition fee LV and EU/EEA/Swiss citizens	Fee for citizens of other countries	Annual income							
	No	No	No	No	No	EUR	EUR	EUR	EUR							
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*1*6+(2+3)*7+4*8*							
FTS (in Latvian)	0	70	0	0	70	0	2400	-	168000	70	0	0	70	0	2 400	168 000
FTS (in English)	0	0	10	0	10	0	2400	-	24000							
Total	**-**	**-**	**-**	**-**	**50**	**-**	**-**	**-**	**192000**							

* EU/EEA/Swiss citizens – European Union / European Economic Area / Swiss Confederation.

** Others – outside of EU/EEA/Swiss Confederation.

Programme costs

To estimate the amount of funds required for financial provision, the prime cost of study programmes at the UL is calculated according to the methodology developed by the UL, which takes into account the cost of ensuring the study process and information on the study programme plan, teaching staff involved, planned number of students and other aspects described in the “Financial Support System”, thus ensuring the reliability of forecasts.

Programme costs for the **full-time regular studies in Latvian (FTS)**

For calculations, the implementers of the full-time regular study programme “Research and protection of Cultural and Environmental Heritage” uses data of the academic year 2022/2023 – number of students on 01.04.2023., study plan/normative acts and structure of the involved academic staff. Based on these data, total cost of the programme is 97 073 EUR per year, and its structure (percentage distribution) presented in the **Table 3.3.3.2**.

Table 3.3.3.2.

Percentage breakdown of costs in the study programme

Expenditure item	**% of total**
Teaching staff costs	41.5%
General staff	19.5%
Other payments	-
Infrastructure expenditure	11%
Property and services	2%
Indirect costs	26%
TOTAL COSTS	**100%**

In **Figure 3.3.3.1**, the prime cost of the study programme is visually represented by the red line (vertical axis) depending on the number of students (horizontal axis), indicated average weighted tuition fee (green line).

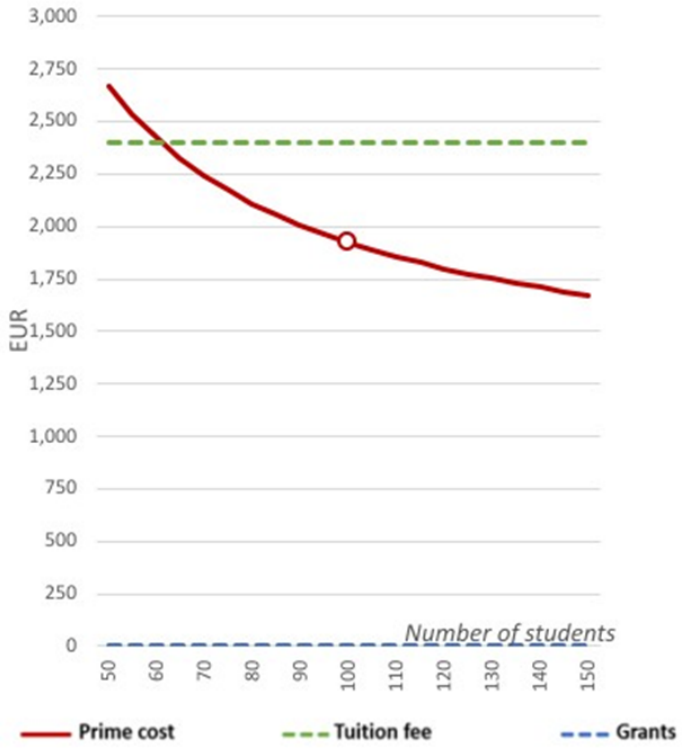


Fig. 3.3.3.1. *Prime cost per number of students of the academic bachelor’s study programme “Research and protection of Cultural and Environmental Heritage”*

Based on the structure of the cost and total number of 80 students the cost of study programme per one student (prime cost) is 1 923 EUR per year.

For the programme to be profitable, the minimum number of paying students should be at least 81 (intersection point of red line and green line).

Programme costs for the **full-time regular studies in English (FTS)**

Considering that the content, structure and the academic staff involved in the study program in English coincides with the study program parameters of in Latvian, the program costs and their structure do not differ from the calculations reflected above.

Summary of the revenue and expenditure of the programme

Table 3.3.3.3 summarises expected number of students, revenue, expenditure, result and profitability (result against revenue, %) of the programme for all forms of implementation.

Table 3.3.3.3

Programme result

Type of study	Total	Total revenue	Total expediture	Result	Profitability
	Number	**EUR**	**EUR**	**EUR**	**%**
Full-time studies (in Latvian)	70	168 000	168 210	-210	*0%*
Full-time studies (in English)	10	24 000	24 030	-30	*0%*
Kopā	**80**	**192 000**	**192 240**	**-240**	***0%***

The study programme in all forms of its implementation (full-time intramural studies) in general is profitable. However, non-fulfillment of the predicted total number of students may result in a non-substantial negative result. In general, the estimated revenues are expected to be equal to the estimated expenses. At the same time, creation of state-donated student places would definitely increase the total number of students in the program, which would make this study program even more profitable.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on

how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Highly qualified industry specialists, experts and lecturers are involved in the implementation of the study program from other educational and cultural institutions. This contributes to the achievement of study results in the most direct way, that is, among the lecturers of the study program are representatives of the National Cultural Heritage Board, practicing restorers, archaeologists, architects. Also, AAL lecturers - artists, sculptors, art historians - are involved in the implementation of the study program. Exact study courses are provided by lecturers from the Faculty of Geography and Earth Sciences and the Faculty of Chemistry. Humanities study courses are taught by lecturers from the Faculty of Humanities and the Faculty of History and Philosophy. All these lecturers, industry specialists ensure the achievement of study results, each of them contributing from their own field.

49 teaching staff members are involved in the implementation of the study program, including 4 professors, 5 associates professors, 14 assistant professors, 8 researchers, 1 leading researcher, as well as 18 industry professionals – LMA lecturers and guest lecturers.

Of the teaching staff involved in the study program, 34 have doctoral degrees, 14 master's degrees and 1 is a restorer-master, which indicates that the teaching staff with appropriate qualifications was chosen.

The knowledge of the English language of the teaching staff involved in the implementation of the new study program allows them to teach study courses in English. Those whose knowledge of English at the start of the program implementation will not meet at least B2 level, will not be involved in teaching courses in English.

The number of teaching staff and their qualifications confirm that the implementation of the study program is in accordance with the regulations the number of teaching staff with appropriate qualifications for the implementation of the program specified in the acts.

According to the information available in Web of Science and Scopus databases, teaching staff involved in the implementation of the study programme in the period from 2016 to 2021 have a total of almost 200 scientific publications. Considering that in the study program as teaching staff LMA lecturers and other industry specialists are also involved, many personal exhibitions, work as exhibition curators and awards of these lecturers are included in the achievements of artistic creativity.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

In the time since the submission of the licensing report, minor changes have occurred in the composition of the study programme’s teaching staff and their qualifications. During the reporting period, the lecturer of the study course “Natural Monuments” has obtained a Doctor of Science (PhD) degree in natural sciences, while the lecturer of the study courses “Basics of the History of Ideas” and “Philosophical and Mythological Thinking: Transformations of Thinking Patterns in European Culture” is appointed to the position of the professor.

The implementation of the study courses “Exploring the Optical Properties of an Object I, II, III and IV” was divided among two tutors.

There also was a change in tutors of the study course “Biocorrosion and Biodegradation”. In turn, to the study course “Data Analysis and Vector Graphics in Cultural Heritage Field” and study course “Natural Monuments” two other lectures has joined.

A completely new study course, “Digitization Methods of Cultural and Environmental Heritage”, corresponding to 4 CP (6 ECTS) has been in included in the study programme. This study course aims to provide practical knowledge and skills in using methods such as laser scanning, photogrammetry and radiolocation in creating the monument’s ‘digital twin’. Currently, this course is added to the study plan within part B (limited elective courses).

Considering the recommendations of experts, the study plan has been supplemented with the sub-module “German Studies” and two more study courses, intended as optional courses for students with prior knowledge of the German language, namely “German Language, Literature and Culture in the Baltics – Historical Heritage” and “Specialization Course I: Acquisition of German Language”.

On December 19, 2022, the director of the study programme Agnese Kukela and the study programme’s concept developer and lecturer of several study courses, Atis Kampars, visited the Estonian Academy of Arts in Tallinn. During the visit, the study programme’s goals, tasks and content were introduced to Estonian colleagues. The visit successfully resulted in an agreement on closer cooperation in science and education, holding joint scientific events and cooperation regarding student exchange within the framework of the Erasmus+ programme. The inter-university Memorandum of Understanding was also signed.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Currently, at the very beginning of the program implementation and its approbation stage, there is communication between the lecturers involved in the implementation of the modules, agreeing on the synchronization of study content and learning methods. Synchronization occurs when lecturers coordinate the content of concurrent courses. As an example of this communication, it is possible to mention the rearrangement of the sequence of lectures of the course "Theory of Styles and Structures of Art and Architecture" with the intention of promoting course's "Representation of Geometric Objects and Space" content learning. In the other case, the methodologies of courses implemented within the framework of one thematic module take place discussion with the aim of optimizing the evaluation of the learning outcomes of the module. In February 2023, among the lecturers involved in the implementation of the study course "Theory of Styles and Structures of Art and Architecture" there was a discussion regarding the final evaluation tasks, assessment of necessary equipment, agreeing on the way the tasks should be completed, available technical solutions and coordination of course methodology. The students were also involved in this discussion.

Further development of the study program envisages its association to international and cultural heritage institutions, as well as education and research related institutions - universities, research institutes and associations of institutions of the field. The recommendations of foreign colleagues will be used in analysis of the content of the study program and methodology, as well as its possible adaptation to the requirements for international cooperation.

At the time of submitting the report, 17 students are studying in the study program and in total in 2022/2023 academic year's autumn and spring semesters and 2023/2024 academic year's autumn semester 20 lecturers were involved to this study program. The proportion of students and lecturers is 1:1.2.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	34P_BSc_Diploma_CH.docx	34P_KVM_Diploms_ar_ pielikumu.docx
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	35P_Statist_CHP_ENG.docx	35P_statistika par studejosiem parskata perioda.docx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	Conformity with standarts_CH.docx	36P_KV_atb_valsts_standt.docx
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	37P_Courses_mapping_RCH.xlsx	37P_Kursu_kartejums_Kulturvide.xlsx
The curriculum of the study programme (for each type and form of the implementation of the study programme)	38P_Study_Plan_CH.docx	38P_Studiju plans_KVM.docx
Descriptions of the study courses/ modules	Course_and_module_descriptions.zip	Kursu_un_modulu_apraksti.zip
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)	ENG_55.pdf	55.3_pants_Apliecinajums_par_akadem_progr_atbilstibu.edoc