# APPLICATION

## Study field "Geography and Earth Sciences" for assessment

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| Study field | *Geography and Earth Sciences* |
| Title of the higher education institution | *Latvijas Universitāte* |
| Registration code | *3341000218* |
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# Self-evaluation report

Study field "Geography and Earth Sciences"

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,.

The University of Latvia (hereinafter - UL) was founded in 1919 and is the only classical university in Latvia, retaining its status as the largest higher education institution in the country in terms of the number of students in 2021. 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.

**Mission**: The mission of the University of Latvia is expressed in its motto *Scientiae et Patriae* (For Science and Fatherland). The University of Latvia (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. The activities of the University of Latvia form the basis for the sustainable development and economic transformation of the Republic of Latvia.

**Values**:

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

The University plays an important 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 University 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 University of Latvia focuses its efforts on providing quality studies and developing scientific excellence, creating structures open to interdisciplinary and transdisciplinary research and studies, ensuring high return on invested resources, sustainable and environmentally friendly use of resources. The University 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 University of Latvia is implemented at 13 faculties, 7 branches and 3 medical colleges. Research activities are also performed at 18 research institutes, and various research, training and consultancy activities are conducted in 28 study centres. The UL Regional Centre coordinates and supervises the activities of the UL branches, as well as promotes cooperation between the University and local authorities in the fields of human resources

development, education and interdisciplinary research. The UL has more than 230 bilateral cooperation agreements with universities in 51 countries. The UL Culture Centre is represented by 21 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. The activities of the UL are also performed by the UL Museum, the UL Botanical Garden, the UL Rhododendron Nursery "Babīte", the UL Academic Publishing House, and the UL Baldone Observatory. The UL Foundation and the Alumni Club have also been operating successfully.

As of 1 October 2021, the UL has 3,250 employees, including 1,420 UL academic staff and 1,830 UL general staff. The UL financial performance is characterised by a turnover of EUR 81 million and an equity ratio of 73%. The main activities of the University take place in Riga, at 19 Raiņa Boulevard and UL Academic Centre in Torņkalns, as well as in several locations in Riga and in the UL regional branches in Aluksne, Bauska, Cesis, Jēkabpils, Kuldīga, Madona and Tukums.

The UL is ranked 601-800 in the Times Higher Education World University Ranking of 2021, its academic staff and students publish more than nine hundred scientific publications annually in the Scopus and Web of Science databases.

The UL offers study programmes at all levels, covering 28 branches of science and 22 fields of study. The UL 13 faculties offer 140 study programmes. See Table 1 for the fields of study, the number of study programmes and the accreditation periods.

*Table 1*

Study fields, number of study programmes and accreditation periods (02.11.2021.)

| No | Study fields | Number of study programmes | Accreditation period |
|---|---|---|---|
| 1. | Architecture and Construction | 1 | 31.05.2013-31.12.2022. |
| 2. | Life Sciences | 3 | 29.05.2013-31.12.2023. |
| 3. | Economics | 8 | 08.09.2021-09.09.2027. |
| 4. | Physics, Materials Science, Mathematics and Statistics | 7 | 29.05.2013-31.12.2023. |
| 5. | Geography and Earth Sciences | 6 | 24.04.2017-24.04.2023. |
| 6. | Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Management, and Computer Science | 5 | 29.05.2013-22.08.2023. |
| 7. | Internal security and Civil defence | 3 | 05.06.2013-31.12.2024. |
| 8. | Information and Communication Sciences | 5 | 16.06.2021-17.06.2023. |

| No | Study fields | Number of study programmes | Accreditation period |
|---|---|---|---|
| 9. | Education, Pedagogy and Sports | 24 | 12.06.2013-31.12.2024. |
| 10. | Chemistry, Chemical engineering and Biotechnology | 3 | 24.05.2013-31.12.2023. |
| 11. | Arts | 1 | 16.10.2015- 02.06.2022. |
| 12. | Psychology | 3 | 21.06.2019-21.06.2025. |
| 13. | Sociology, Political science and Anthropology | 9 | 12.06.2013-31.12.2024. |
| 14. | Social Welfare | 2 | 14.05.2013-31.12.2022. |
| 15. | Religion and Theology | 3 | 22.05.2013-31.12.2023. |
| 16. | Law | 4 | 21.06.2019-21.06.2025. |
| 17. | Translation | 2 | 14.05.2013-31.12.2024. |
| 18. | Management, Administration and Real estate management | 8 | 29.00.2021-30.09.2027. |
| 19 | Language and Culture studies, Native language studies and language programmes | 21 | 26.06.2013-31.12.2024. |
| 20. | Healthcare | 13 | 31.05.2013-31.12.2022. |
| 21. | History and Philosophy | 6 | 24.05.2013-31.12.2023. |
| 22. | Environmental protection | 3 | 05.06.2013-31.12.2024. |

UL study programmes in several fields of study are also available in seven UL branches located in the regions of Latvia. In the academic year 2021/2022, 11 different fee study programmes in 3 study fields, ranging from first-level (college) higher education study programmes, professional bachelor's study programmes to master's study programmes, are being implemented in the branches. See Table 2 for the number of study fields and study programmes in the branches.

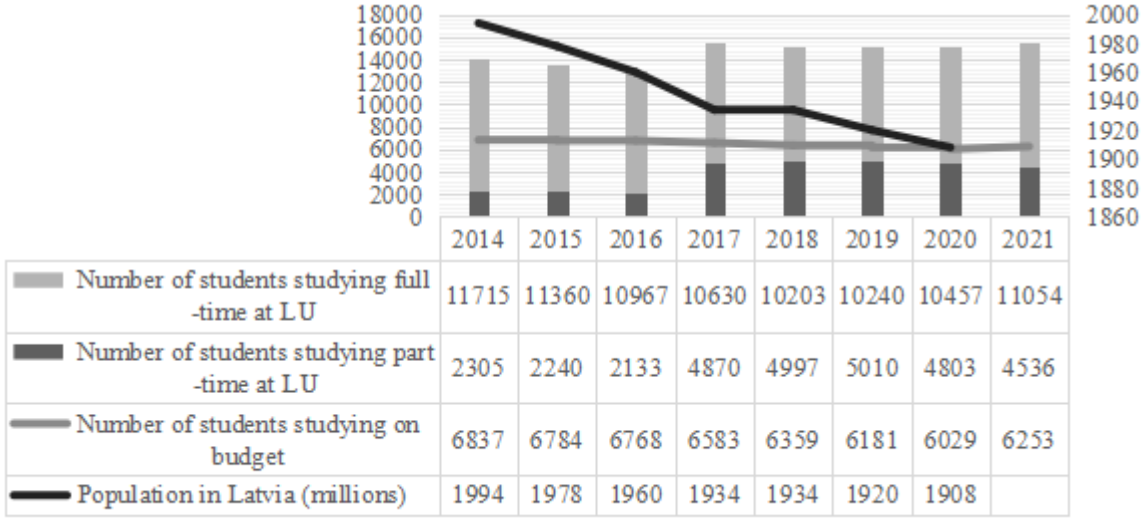
*Table 2*

Number of study fields and study programmes implemented in the regional branches of the University of Latvia, data as of 2021

| Branches | Aluksne (founded 1997) | Bauska (founded 1997) | Cēsis (founded 1995) | Jēkabpils (founded 1996) | Kuldīga (founded 1996) | Madona (founded 1997) | Tukums (founded 1996) |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Number of study fields | 3 | 1 | 2 | 1 | 2 | 1 | 1 |
| Number of study programmes | 5 | 3 | 7 | 4 | 9 | 3 | 6 |
| Number of students | 75 | 146 | 428 | 99 | 302 | 99 | 333 |

As of 1 October 2021, the total number of students studying at the University of Latvia is 15 590, 40% of whom are financed from the state budget. Around 10% of students study at UL branches. In total, almost five thousand new students are enrolled every year (Fig. 1).




| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| Number of students studying full -time at LU | 11715 | 11360 | 10967 | 10630 | 10203 | 10240 | 10457 | 11054 |
| Number of students studying part -time at LU | 2305 | 2240 | 2133 | 4870 | 4997 | 5010 | 4803 | 4536 |
| Number of students studying on budget | 6837 | 6784 | 6768 | 6583 | 6359 | 6181 | 6029 | 6253 |
| Population in Latvia (millions) | 1994 | 1978 | 1960 | 1934 | 1934 | 1920 | 1908 | |

Fig.1. Number of students at the University of Latvia against the population of Latvia, 2014-2021

The UL medium-term development strategy for the period from 2021 to 2027 (UL Strategy 2027 LV, ENG) was approved on June 28, 2021, by the Senate decision No.2-3/ 90. With the cooperation of the involved parties and the analysis of the national and international competitiveness of the University of Latvia, the mission of the University of Latvia has been revised and strategic goals have been defined in six development directions - three in each - in the core business and institutional areas. Development goals have been set for science, studies, public education, as well as in the domains of staff and organizational culture, environment and governance. The UL Strategy 2027 envisages the further development of the University as an internationally recognised science centre, the development of unique study and lifelong learning programmes, as well as the offer of competitive working and study conditions. The University continues the work initiated in the previous strategic period to achieve the highest level of scientific excellence, as well as to promote student-oriented studies and develop a modern study environment. The UL engagement with and contribution to the society of Latvia is being purposefully promoted. The University is improving the working conditions and environment necessary for talent development. Sustainable growth is playing an increasingly important role and is becoming a cross-cutting principle in all of the UL areas of activity. Significant attention is paid to ensuring academic integrity and strengthening the value-oriented organisational culture of the University. See Table 3 for the current strategic goals and development directions of the University.

*Table 3.*

*UL Strategic Goals Map, 2021-2027*

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

The outcomes of the implementation of the UL Strategy 2027 will be measured by twenty-one performance indicators, five of which have been designated as UL Key Performance Indicators (KPIs). - These 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 the UL (%), as well as the commercialization 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.**

Up until the introduction of the Higher Education Reform (hereinafter - HER), the Constitutional Assembly, the Senate, the Rector and the Academic Arbitration Court (UL Constitution, 5.1) were the UL governing, management and main decision-making bodies. In 2022, a new governing body of the University started its work - the Council of the University elected by the Cabinet of Ministers of the Republic of Latvia (Law on Higher Education Institutions, 12(1)). See Table 4.

*Table 4*

*Terms of election, representation and terms of office of the main decision-making bodies of the University*

| | Changes | Term of election | Total number of participants | Academic staff representation | General staff representation | Student representation |
|---|---|---|---|---|---|---|
| Constitutional Assembly | Prior to HER | 3 years | 300 | 66.7% | 8.3% | 25% |
| | After HER | 3 years | 200 | >60% | - | >20% |
| University Council | From 2022. | 4 years | 11 | 5 | | |
| Senate | - | 3 years | 50 | 76% | 4% | 20% |
| Rector | - | 4 years | 1 | 1 | | |
| Academic Arbitration | - | 3 years | 5 | 80% | 0 | 20% |

| Full name | |
|---|---|
| **Constitutional Assembly** | |
| Prior to HER: The Constitutional Assembly is the supreme representative body of the UL (UL Constitution, Section 5.3). | After HER: The Constitutional Assembly of the University is the representative body of the academic staff, general staff and students of the University. (Law on Higher Education Institutions, Section 13) |

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| Competence prior to HER: adopts and amends the Constitution of the University of Latvia; adopts the Statutes of the Constitutional Assembly; approves the Statutes of the Senate; elects and dismisses members of the Senate; elects and dismisses the Rector; hears the Rector's report on the activities of the University of Latvia; approves the Statutes of the Court of Academic Arbitration; elects and dismisses members of the Audit Commission; elects and dismisses members of the Court of Academic Arbitration. The Constitutional Assembly has the right to adopt for consideration and decision other conceptual issues concerning the activities and development of the University (Section 5.3 of the Constitution of the University). | Competence after HER: **approves** the University's constitution and amendments thereto, elects the Rector; **may propose** the Rector's dismissal; hears the Rector's annual report on the university's activities; elects members of the Senate from among the academic and general staff; may recall members of the Senate; elects the Academic Arbitration Court (Law on Higher Education Institutions, Section 14). |

**University Council** (after HER)

Competence after HER: The Council of a state-run University is a collegial decision-making body of a state-run University, which is responsible for the sustainable development, strategic and financial supervision of the University, as well as ensures the operation of the University in accordance with its development strategy. (Law on Higher Education Institutions, Section 14.1)

The University Council approves the University's constitution and amendments thereto and submit them for approval at the Constitutional Assembly; approves the University's development strategy and monitors the progress of its implementation; approves the University's budget and financial plan, as well as annual reports; monitors the functioning of the cooperation and financing agreement between the University and the State; monitors the functioning of internal control and risk management systems, reviews their adequacy and effectiveness; approves policies defining the University's management processes and general principles of their functioning; decides on: the structure of the University, the establishment, reorganisation and liquidation of the University's structural units, the establishment and liquidation of the University's branches and institutions, the University's participation in commercial companies, foundations and associations, the remuneration policy of the University's staff, the attraction of investments, the University's credit commitments, the University's real estate development plan, the appointment of the University's auditor; approves the regulations for the election of Rector; nominates one or more candidates for election to the position of Rector at the Constitutional Assembly, concludes an employment contract with the Rector and evaluates the activities of the Rector; may initiate the removal of the Rector from office, as well as decide on the removal of the Rector from office, observing the provisions of the Law on Higher Education Institutions. The Council seeks the opinion of the Students' Council before taking decisions concerning the amount of tuition fees, the closure of study fields and programmes, and scholarships established by the University (Section 14.2 of the Law on Higher Education Institutions).

**Senate**

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|---|---|
| Prior to HER: The Senate is a collegial management and decision-making body established by the staff of the University, which approves the rules and regulations governing the activities of the University. | After HER: The Senate is a collegial supreme academic decision-making body of the University, responsible for the excellence, development and compliance with internationally recognised quality standards of the University's education, research and creative activities. The Senate regulates the academic, creative and scientific activities of the University. (Law on Higher Education Institutions, Section 15(1)) |

Competence prior to HER: Approves the rules and regulations governing the activities of the UL. The UL Senate elects Honorary Doctors and Honorary Members of the UL, the Court of Honour of the UL, the Advisory Council of the UL; elects and dismisses the Chair of the Senate (professor) and his/her deputy(s), organises the election of the Rector, approves the UL budget, Vice-Rectors and UL Directors, the UL Chancellor, Deans, Directors of UL Scientific Institutes and other heads of UL core structural units, the Regulations of the Advisory Council, Regulations of the Administration of the UL, upon the proposal of the Rector; approves study programmes and their directors, the Secretary of the Senate (on the proposal of the Chair of the Senate), approves the regulations or statutes of the associations, foundations, public agencies, commercial companies, institutions and other institutions established for the achievement of the objectives specified in the Satversme (Constitution), the regulations on academic and administrative positions, the Constitution of the Student Council of the University of Latvia, the conceptual documents regulating the study process, the Regulations of the Court of Honour of the University of Latvia, the Rules of Procedure of the University of Latvia, the decisions of the Academic Arbitration Court of the University of Latvia; decides on the establishment, reorganization or liquidation of faculties, scientific institutes and other core structural units, as well as associations, foundations, public agencies, commercial companies, institutions and other institutions, on the use of the name and attributes of the University of Latvia, on essential issues of economic activity, incl. acquisition, pledge or alienation of real estate, for convening a Constitutional Assembly. The Senate may also accept for consideration other significant issues of activities of the University of Latvia, as well as provide an explanation regarding the application of the norms of the Constitution of the University of Latvia. (Section 5.6 of the Constitution of the University of Latvia)

Competence after HER: **Develops the draft Constitution of the University and its amendments. The Senate is responsible for the compliance of the Constitution with the development needs of the University and regulatory enactments; approves the development plan of the study process of the University, submits proposals to the Council regarding the fields of study to be developed;** on the proposal of the Rector decides on:
the opening, development and closure of study fields, the opening, content and development of study programmes, as well as the closure, requirements, procedures and examinations for the acquisition of degrees and qualifications; **approves the development plan of the scientific and artistic creative activity of the University,** encourages the implementation of specific directions of scientific activity; determines the requirements for election to academic positions and the evaluation criteria for the academic staff; determines the requirements and procedures related to the observance of academic integrity; **nominates the members of the University Council in accordance with the procedures specified in the Constitution of the University; may initiate the removal of the Rector from office, as well as decide on the removal of the Rector from office; provide an opinion and make proposals regarding the development strategy, budget, establishment, reorganization and liquidation of the structural units of the University and the real estate development plan prior to their consideration by the Council.** The Senate has the power to set up committees to coordinate and resolve individual issues.  (Law on Higher Education Institutions, p. 15.1)

| Rector | |
|---|---|
| Prior to HER: The rector is the highest official of the UL who implements the general administration of the UL and represents the UL without special authorisation. | After HER: The Rector is the highest official of a higher education institution who implements the general administration of the higher education institution and represents the higher education institution without special authorisation. (Law on Higher Education Institutions, Section 17 (1)) |

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| Competence prior to HER: The Rector oversees the activities of the University and is responsible for the compliance of these activities with the Law on Higher Education Institutions and other regulatory enactments, as well as with the Constitution of the University. The Rector, in accordance with his competence, issues orders and determines the competences of the Vice-Rectors, Chancellor and Directors (Section 5.10 of the Constitution of the University of Latvia). | Competence after HER: The Rector ensures the management of the University and is responsible for the achievement of the goals set out in the University's development strategy, as well as for the efficient and lawful use of the University's financial resources in accordance with the law, other normative acts, as well as the University's constitution, decisions of the Council and the Senate. The Rector exercises the representative functions of the University, performs other activities to ensure the success of the University and represents the University in cooperation with other institutions and individuals. The Rector issues orders within the scope of his/her competence. **The Rector ensures the elaboration of the study and scientific development plan of the University and submit it to the Senate for approval,** ensures the elaboration of the development strategy of the University and **submits it to the Council for approval after receiving the approval of the Senate of the University**. The Rector, in cooperation with the University departments, ensures the implementation of the University development strategy.<br>**The Rector appoints and dismisses Vice-Rectors and Deans, as well as determines their areas of competence, authority and responsibility, in accordance with the objectives set out in the University's development strategy.** The Rector is responsible for the successful implementation of the University's personnel policy. The Rector ensures the preparation of the budget of the University and, **after obtaining the approval of the University Senate, submits it to the Council for approval**. The Rector is responsible for the implementation of the budget and **submits the annual accounts of the University to the Council for approval. The Rector, by the mandate of the Council, manages the funds of the University,** including the necessary actions related to the University's credit obligations and the attraction of investments. **The Rector takes decisions on the acquisition, encumbrance or disposal of immovable property in accordance with the real estate development plan approved by the University Council.** The Rector, within the scope of his/her competence, is responsible for the compliance of the activities of the University with this Law and other regulatory enactments. (Law on Higher Education Institutions, Section 17.1) |

**Academic Arbitration Court**

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| Competence prior to HER: Examines applications from students and academic staff concerning restrictions or violations of academic freedoms and rights outlined in the Constitution of the University, as well as disputes between UL officials, as well as administrative bodies of structural units in subordinate relations. (Section 5.15 of the Constitution of the University of Latvia) | Competence after HER: Examines applications of students and academic staff concerning limitations or violations of academic freedoms and rights stipulated in the Constitution of the University, disputes between officials of the University, as well as governing bodies of departments in subordination relations, in **the cases specified in the Law on Higher Education Institutions, examines applications regarding contestation of an administrative act or actual action and makes relevant decisions regarding the same, as well as performs other tasks stipulated in the Constitution of the University.** (Law on Higher Education Institutions, Section 19) |

For information on the governance structure of the UL (UL Structure LV, ENG), its composition and competences, see Section 1.2 of the UL Quality Management System Manual.

### 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 of the University** is a continuous evolution towards excellence to ensure balanced and sustainable outcomes that meet the needs of all stakeholders. The Quality Policy and the resulting Quality Action Policy are a set of quality-related principles, objectives and the actions necessary for their achievement, implemented by the University in accordance with internationally recognised standards in higher education and organisational governance (Fig.2). The Quality Policy aims to contribute to the achievement of the mission, strategic objectives and sustainable development of the University by setting out guidelines and principles that can be used to ensure a consistently high quality of performance. The Quality Policy and the Quality Action Policy, together with other policies and processes, ensure the coherent planning and implementation of the activities of the University. The Quality Policy and Quality Action Policy are an integral part of the Quality Management System, which is applied to all areas of UL activity and envisages its implementation at all levels of UL governance. The quality is defined as a measure of excellence that characterises the ability of the UL to meet and exceed the foreseeable and future needs of its stakeholders, and to ensure that its processes comply with industry regulatory and standard requirements. The UL provides a set of activities and methods by which quality is planned, implemented, systematically assessed and continuously enhanced, thereby contributing to the achievement of the UL's stated objectives and to meeting the needs of its stakeholders.

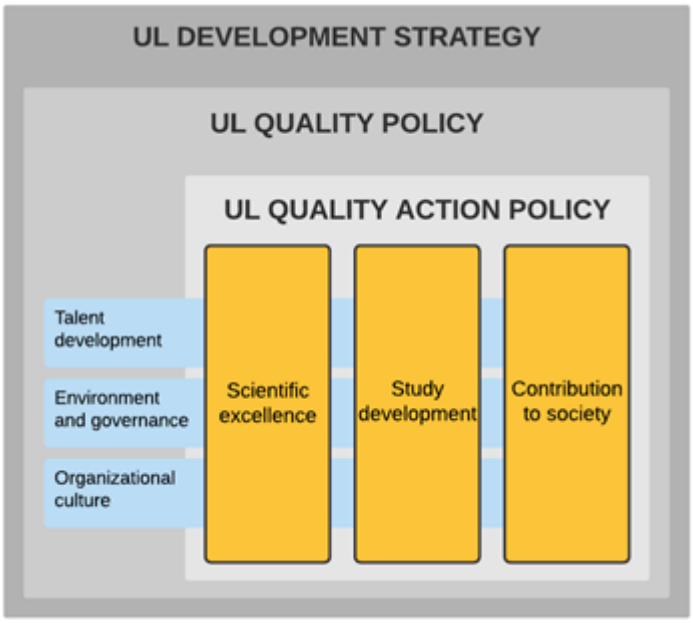


*Figure 2. Hierarchy of Quality Policy and Action Policies at the University of Latvia*

Quality management has been implemented at the University since 2010. The quality management system of the University is implemented in accordance with the principles of Total Quality Management (TQM), integrating the approach of excellence into the corporate culture of the University. For the implementation of Total Quality Management, the UL uses an internationally recognised and practically applicable quality management methodology - the EFQM (European Foundation of Quality Management) Excellence Model.  The quality management system is enhanced in the core activities areas by developing internal quality assurance systems integrated into the quality management system and based on current sectoral standards and frameworks. The internationally recognised Results - Approach - Deployment - Assessment and Refine (RADAR) methodology is used to ensure the cyclicality and continuity of quality management at the UL, and the Plan - Do - Check - Act (PDCA) approach is used in quality assurance systems. Figure 3 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 Section 2.1 of the UL Quality Management System Manual.

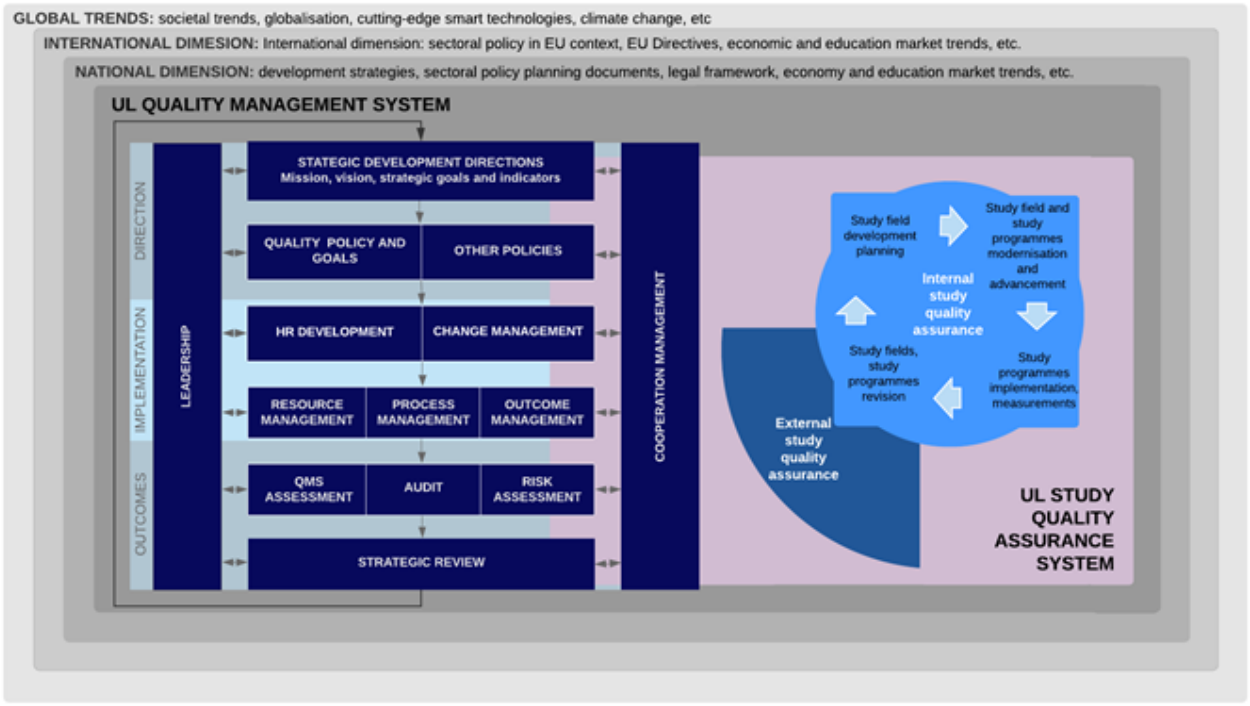


*Figure 3. UL Quality Management System and Principles of the Quality Assurance System*

To ensure the quality of higher education, the University of Latvia 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 national legislation, the European Standards and guidelines for quality assurance in the European Higher Education Area (ESG), as well as for internal needs. The University of Latvia provides planning for the development of the study field and improvement of the existing study programmes for a period of 6 years. The procedure for the implementation of study programmes is laid down in the internal legal acts of the University, including 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 placements, organization of examinations and final examinations, rotation, the principles of academic integrity and their observance, matriculation, issuance of diplomas and certificates, recognition of previous education or professional experience, the procedure for conducting surveys, submission of student proposals and complaints, contestation of administrative decisions, doctoral dissertation promotion process, etc. The University 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, to the UL Strategic Action Plan. For more information on quality assurance of studies, see Section 3.1 of the UL Quality Management System Manual. For the breakdown of responsibilities for quality management and assurance, see Section 2.5 of the UL Quality Management System Manual.

The UL quality assurance system is based on the participation of key stakeholders in the quality assessment and improvement of the University's activities. The 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 main stakeholders are defined in point 12 of the UL Quality Policy. For the description and examples of the roles of key stakeholders in

quality management, see Section 3.2, sub-section 1.2 (Table 3.6) of the UL Quality Management System Manual.

**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.**

| | | |
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| 1. | The higher education institution/ college has established a policy and procedures for assuring the quality of higher education. | The University has formulated Quality Policy (https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Dokumenti/Dokumenti_EN/2/Kvalitates_politika_majas_lapai_ENG.pdf) in line with its Strategy (https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Dokumenti/Dokumenti_LV/1._VISPAREJIE_DOKUMENTI/LU_strategija_buklets_2021.pdf) which is detailed in the Quality Action Policy. (https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Dokumenti/Dokumenti_EN/2/Kvalitates_ricibpolitika_majas_lapai_ENG_new.pdf)<br><br>For quality assurance of higher education, the Studies Quality Assurance System (in compliance with ESG) has been implemented and integrated into the 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 System Manual.<br><br>The establishment, maintenance and improvement of the UL quality management system at the University of Latvia 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 System Manual (https://drive.google.com/file/d/1qIZ09XWRZuloasl7xhmjGEAvl3dWQUPQ/view - only in Latvian). |
| 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 establishment and internal approval of study programmes are stipulated in the Regulations of the University of Latvia on Study Programmes and Continuing Education Programmes (UL Senate Decision No 102 of 24.04.2017). For more information, see Section 2.4 of this report, as well as sub-section II of Section 3.1 the UL Quality Management System Manual.<br>Periodic quality review of study programmes is stipulated in the “Procedure for Preparation of Annual Reports on UL Study Fields” (UL Order No.1/290 of 14.07.2020). For more information see Section 2.4 of this report, Section 3.1, sub-sections IX and X of the UL Quality Management System Manual. |

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| 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 course descriptions, the preparation and updating of which, as well as the rules for their publication, are stipulated in the UL course development and updating procedure. The conduct and assessment of entrance 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 University.<br>The desired ethical and fair conduct and justice are ensured at the University of Latvia by internally regulating issues related to 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 Quality Management System Manual, Section 3.2, sub-section 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 University of Latvia in the areas of personnel selection, labour relations, motivation system and personnel development are defined in the UL Personnel Management Policy (https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Dokumenti/Dokumenti_EN/3/264_personala_vadibas_politika-en.pdf). 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 University of Latvia in accordance with the external regulatory enactments, and 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 the UL Quality Management System Manual, Section 3.2, sub-section 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' achievements is accumulated in the information system LUIS of the University of Latvia 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 Procedure for the Organisation of Regular Surveys to Evaluate the Study Process at the University of Latvia (UL Order No.1/334 of 22.08.2016). For more information on the involvement of stakeholders in quality assurance see Section 3.2, sub-section 1.2 of the UL Quality Management System Manual. 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 Section 3.1, sub-section VII of the UL Quality Management System Manual. The UL performance management system introduced and implemented at the University of Latvia monitors key performance indicators of the University of Latvia on the basis of which further strategic decisions are made. For more information, see Section 3.2, sub-section 7 of the UL Quality Management System Manual. |

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| 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 University. The monitoring of the plan and the evaluation of its effectiveness are carried out within the framework of the annual self-assessment of the study field. These processes take place at the level of the 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.<br>The UL provides the external evaluation required by the legislation, obtaining additional external quality certificates for individual programmes. For more information, see Part II, Section 2.4 of this report.<br>To promote the quality and competitiveness of the study programmes of the University of Latvia, the University of Latvia creates and finances internal grant projects (University of Latvia Study Quality Improvement Fund), as well as attracts external funds. |

## 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 shared **goals** of the Study direction “Geography and Earth Sciences” include ensuring the ability to complete an academic education in geography, geology, and geoinformatics, to develop research skills, and to facilitate the development of practical skills that are necessary in the labour market so as to train highly qualified specialists and to facilitate the development of the fields of geography and geology. The goals and missions of the geography, geoinformatics and geology study programmes are in line with the developmental strategies of the Republic of Latvia and the University of Latvia (UL)[1], ensuring that graduates can successfully find jobs at the Latvian Environmental, Geology and Meteorology Centre, the Ministry of Environmental Protection and Regional Development, the State Environmental Service, the Ministry of Defence, the Latvian Geospatial Information Agency, and other organisations and private companies. The knowledge, skills and competencies of the graduates of the study programmes allow them to engage in the research, rational use and protection of the natural habitat, the changes it undergoes and their causes, as well as the consequences of these changes and development trends of human economic structures, and studies of the Earth and its rational use and protection, thus facilitating the growth of Latvia and its people. Geography, geoinformatics and geology studies at the UL are part of the overall study of the natural sciences, without which natural science studies would be incomplete. Hence, the strategy for the development of the studies aims at strengthening the material and technical aspects of study programmes, to facilitate the recognisability and prestige of this area of

study, and to activate research in the relevant sub-sectors of science. In general terms, the strategy is in line with the Education Development Guidelines for 2021-2027[2] which aim to promote excellence in higher education, strengthens the governance of institutions and strengthens the quality of academic staff. The studies in Latvian facilitate the evolution and functioning of the language, ensuring the development of terminology in geography and other Earth sciences in Latvian. The courses that are taught in English make it possible to internationalise the study process.

According to the Regulations on the Classification of Latvian Education, the field of study of Geography and Earth Sciences corresponds to the thematic area of Physical Sciences in the thematic group of Natural Sciences, Mathematics and Information Technologies. The European Commission's Science and Technology Classification (FOS 2007) and the Organisation for Economic Co-operation and Development's (OECD) Frascati Manual (http://www.oecd.org/science/inno/38235147.pdf) among Natural sciences includes Earth and related environmental sciences such as physical geography, geology, multidisciplinary geosciences, mineralogy, palaeontology, geochemistry and geophysics, meteorology, climatology, hydrology and others. Therefore, combining of the study programme “Geography”, which offer studies in various sub-branches of geography, as well as meteorology, climatology, hydrology, with the study programme "Geology", which provide studies in geology, mineralogy, paleontology, geochemistry, geophysics, hydrogeology and engineering geology , as well as with the study programme "Geoinformatics", which is based on the use of geographic data for the needs of the national economy, in the study direction "Geography and Earth Sciences" is completely logical and justified.

[1] https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Dokumenti/Dokumenti_LV/1._VISPAREJIE_DOKUMENTI/LU_strategija_buklets_2021.pdf

[2] Guidelines for the development of education for 2021-2027 “Future skills for the society of the future”, Cabinet of Minister Instruction No. 436, 22.06. 2021.

**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.**

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| Internal factors | |
| Strengths | Weaknesses |

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| 1) The most thorough higher education in the geosciences in Latvia, with extensive representation of the main sub-sectors in geography and Earth sciences, as well as the ability to specialise;<br>2) The study programmes included in the study direction correspond to the three-cycle degree system of the Bologna process (since 2021, the doctoral study programme has been implemented in another field of study, based on the development plan approved by the Ministry of Education and Science of the Republic of Latvia and the University of Latvia);<br>3) Experienced, highly qualified, creative and professional academic staff with extensive experience in research and teaching; use of modern technologies in the study process;<br>4) Development of research activities of academic staff and students, opportunity to participate in the implementation of Latvian and European research projects, international scientific conferences and seminars;<br>5) The use of the Academic Centre House of Nature of the University of Latvia ensures the information technology infrastructure that meets modern requirements and has substantially increased the capacity and availability of laboratories and libraries, ensuring broader access to and more rational use of the infrastructure for research and studies, as well as wider co-operation with other fields of the natural sciences;<br>6) High-quality library resources and access to many global electronic publications and E-resource databases;<br>7) Good supply of geological funds, cartographic data, samples and collection materials;<br>8) Close co-operation with other institutions of higher education in Latvia (Riga Technical University, RTU; Daugavpils University, DU) and research institutions and agencies, with support from those institutions;<br>9) Active participation in scientific work at the international and national level;<br>10) A good partnership with employers and the relevant programmes at the UL, DU and RTU. | 1) Insufficient state budget finances for the study process and scholarly research;<br>2) Low proportion of foreign lecturers in the academic staff and limited financial opportunities to attract high-level foreign lecturers;<br>3) A large number of students are overworked due to the need to work in parallel with their studies, which limits their study time and reduces the quality of their study work;<br>4) Relatively many students who do not complete their studies;<br>5) Insufficient original educational resources in Latvian. |

| External factors | |
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| Opportunities | Threats |
| 1) The use of the Academic Centre for Natural Sciences allows considerably strengthen interdisciplinary studies and research, as well as broaden co-operation with the other high education organisations;<br>2) EU financing to improve the quality of studies and the availability of EU and national financial resources for the development of natural science study programmes and research projects;<br>3) Expanded co-operation with foreign universities, increasing the attractiveness of the programmes for foreign students, as well as study opportunities as part of the Erasmus and other programmes;<br>4) Expanded co-operation with applied geological, environmental and other organisations;<br>5) Possibilities of creating study courses in English and other languages;<br>6) Attracting qualified Latvian and foreign guest lecturers using EU funds;<br>8) Wider advertising of study programmes on social portals, home page of the UL and other Internet sites, as well as in schools;<br>9) Extensive, diverse labour market for both bachelor's and master's graduates. | 1) Demographic (including emigration) and economic problems mean fewer school graduates, thus reducing the number of potential students at the bachelor's degree level;<br>2) High school graduates have less knowledge in the exact sciences, which can seriously endanger the training of highly qualified specialists in geography and particularly in geology;<br>3) A lack of financing for the on-going education of academic personnel;<br>4) A long-term and unending cut in budget resources for studies and scientific research;<br>5) Difficulties in finding highly qualified foreign and local instructors in some areas of specialisation that have high salaries in the private sector;<br>6) Possible consolidation of national budget-subsidies study programmes with few students creates the risk of ending the training of specialists in areas that are of vital necessity for the Latvian economy. |

Evaluating the strengths and weaknesses of the study field "Geography and Earth Sciences" implemented by the Faculty of Geography and Earth Sciences of the University of Latvia (hereinafter FGES), it can be concluded that the strengths are dominant. The FGES has set a goal to further strengthen and develop the strengths of the field by expanding cooperation with other Latvian and foreign universities, applied geological, environmental and other organizations, as well as with employers. The opportunities for further development of the firld are wide, which is likely to prevent and overcome threats. The field of study should be developed to ensure that theFGES provides the best education in the field of geosciences not only in Latvia, but also in the whole Baltics. The SWOT analysis of the study field serves as a basis for improving the quality and operation of the field (see Annex "Plan for the development of the study field").

The first time a development plan for the field of study was prepared during the reporting period for the annual self-assessment report for 2020. The development plan was approved at the meeting of the Council of the Study field and reviewed by the Quality Evaluation Commission of the Study Programmes of the University of Latvia. This plan was updated at the beginning of 2022, during preparation of this self-assessment report, as some of the tasks originally included in the development plan had already been completed. The development plan of the study field is

comprehensive, designed for the next six years and in connection with the SWOT analysis envisages::

To increase the topicality of the content of study courses and compliance with the tendencies in geography and geology science, as well as the needs of the labour market;

To increase and stabilize the number of persons wishing to study in bachelor's and master's study programmes, to reduce drop-out rates;

To increase the number of academic staff and students using Erasmus + support;

To ensure internships for academic staff in Latvian and foreign universities;

To increase the involvement of students in the implementation of research projects;

To ensure 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 (headed by Vice-Rectors), Faculty Councils and Study Programme Councils, which evaluate study quality and decide on study quality assurance measures. The governance of the University of Latvia is responsible for the quality of studies, delegating responsibility for the functioning of the study quality assurance system to the Academic Department. The responsibility for the quality of the study field and the study programmes implemented therein lies with the head of the study field and dean, study programme directors, and sub-programme directors. Each lecturer is responsible for the quality of the content and implementation of the course, research activities and professional development. The students' responsibility is defined in their rights and obligations to promote the achievement of UL goals and excellence in studies, participating in the UL collegial institutions and regularly expressing their opinion in student surveys. See the governance scheme of the study field of the University of Latvia and the study programmes included therein (Fig. 4).

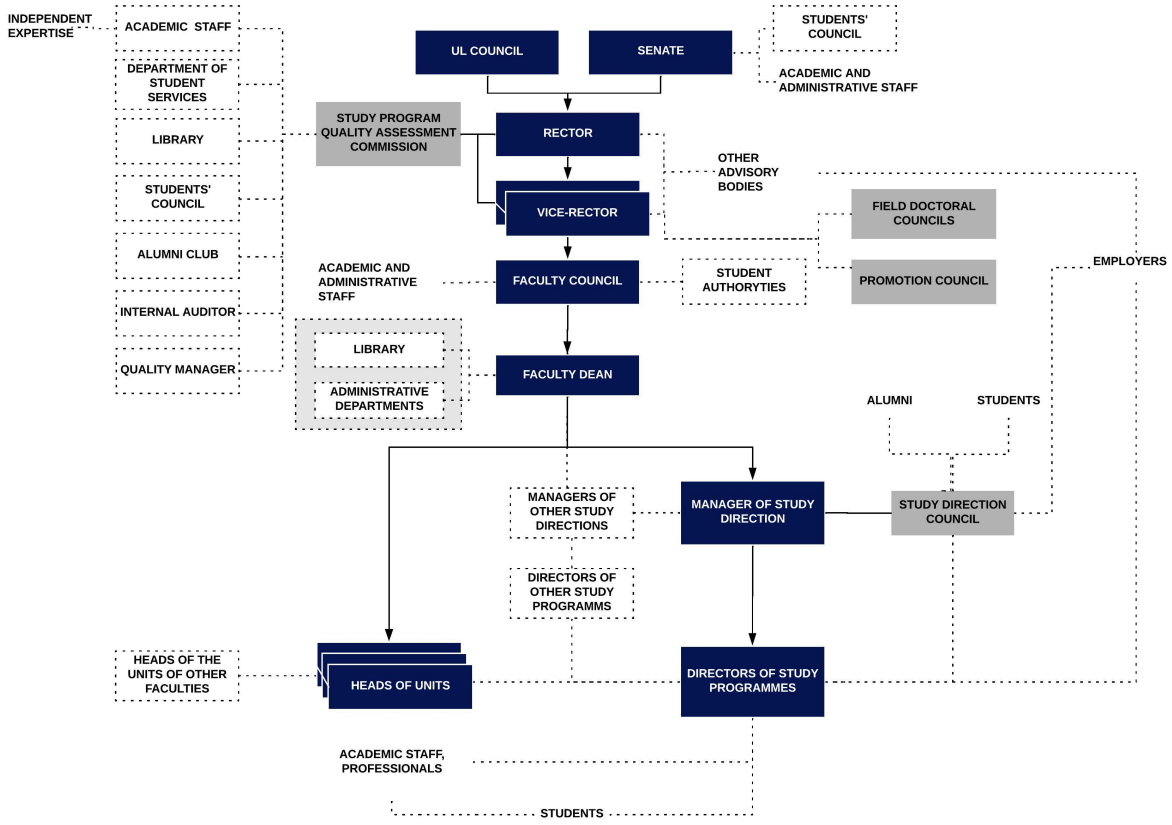


*Figure 4. Management scheme of the study field of the University of Latvia and the study programmes included therein*

The Regulations on the Management of Study Fields at the University of Latvia (available onli in Latvian language) determine the procedure for the management, quality assurance and development of study fields at the UL, the functions and operating principles of the Study Field Council, qualification requirements, duties, responsibilities and rights of the head of the study field and director of the study programme and head of the sub-programme of the field.

Each UL study programme has a study programme director who directs the development and implementation of this study programme. The director of the study programme is approved by the Senate on the proposal of the Faculty Council representing the respective branch of science. The director of the study programme is a member of the Study Field Council of the respective branch and coordinates his/ her activities with the Head of the Study Field and Study Field Council. The director of the study programme is accountable for his/ her activities to the dean of the faculty. The 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 University of Latvia and other responsibilities. If the study programme covers several sub-programmes, the **sub-programme director** may be approved by the decision of the Faculty Council. The Head of the sub-programme is approved by the Faculty Council. If several faculties are involved in the implementation of the study programme, the Head of the sub-programme shall be approved by the Faculty Council which grants the corresponding degree or qualification on the proposal of the deans of the faculties involved in the implementation of the programme. The sub-programme director is a member of the relevant Field Council. The Head of the sub-programme is accountable for their activities to the Director of the study programme. The responsibilities of the director of the study sub-programme include, in cooperation with the director of the study programme, organizing and managing the development and implementation of the sub-programme, as well as preparing the documentation required for the approval, licensing and accreditation of the sub-programme.

The competence of **the head of the study field** (hereinafter - 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 faculty. The Head of the study field is accountable to the Study Field Council and the Dean. The heads of study fields, in co-operation 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 branches, ensure the revision, development planning and implementation of study programmes included in the study field. The heads of study fields organize the work of study field councils, as well as regularly organize the development of annual study field reports and their promotion for review and approval by the Study Programme Council and the Faculty Council. The heads of study fields in co-operation with the study programme directors and the UL Academic Department ensure the accreditation and re-accreditation of the study field and perform other duties.

**The Study Field Council** (hereinafter - 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 head of the study field, all the directors of the study programmes corresponding to the study field, the representatives of the students in the 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 Student Council), representatives of employers and co-operation partners of the study field (candidates are nominated by the heads of structural units, heads of fields, directors of study programmes and heads of sub-programmes). The composition of the Field Council may be complemented by involving graduates of the study field programme who are not involved in the implementation of the study field, as well as by professors, associate professors and other qualified specialists (candidates are nominated by the heads of structural units, heads of fields and study programme directors). The Field Council approves the development strategy of the study programmes of the given branch, evaluates and submits the conceptualisation of new study programmes for approval to the Study Programme Quality Assessment Commission, evaluates and submits for Faculty Council’s approval the annual reports of study fields, as well as changes in study programmes.

**Council of the Faculty of Geography and Earth sciences**, consisting of representatives of the academic and general staff, elected for three years, and student representatives, who make up at least 20 per cent of the councillors, decides on academic, economic, financial, and other activities of the faculty that are within the competency of the faculty or may be passed on to the Senate.

Starting the implementation of the UL Strategy 2027, based on the efficiency audit of the administrative structural units performed in 2021, in November 2021 the UL Administration was significantly reorganized, thus strengthening the strategic and quality management functions in the structural units of the Administration. One of the most significant changes is the integration of the Department of Studies 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 includes the following units: Academic Department, Department of Study Services, 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 University of Latvia, the internal auditor, the quality manager, the head of the work safety system, and the information technology security manager also work in the administration. The study

process is also supported by the Culture Centre, the Sports Centre and the Pre-study Training, which are under the supervision of the Head of the Administration. **The Academic** plays a key role in the governance 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 development policy documents, as well as standards and good practices in the field of academic activities and lifelong learning, to ensure the development of regulations and supervision of their implementation in these fields, to ensure the development, implementation of studies, as well as scientific quality assurance systems (or processes), monitoring and continuous improvement of their implementation, ensure regular review of academic and lifelong learning processes and risks, necessary control and identification and provision of preventive measures in accordance with the practice implemented by the University of Latvia, to ensure analytical identification of the outcomes of academic activities and lifelong learning and the opportunities for their improvement, development of proposals for the Governance of the University of Latvia. The Study Quality Assurance Division monitors compliance with the internal regulations for all study levels and lifelong learning, coordinates the medium-term development plan of studies and lifelong learning in cooperation with faculties, manages its implementation, monitors and provides methodological support in developing new study programmes and implementing and improving existing programmes; processes in studies and lifelong learning, organizes and coordinates external quality assessment, ensures centralized administration of doctoral student admission, doctoral studies and promotion process, provides support in the process of implementation and improvement of studies and lifelong learning at all levels, evaluates study and lifelong learning programme results and competitiveness, and participates in resource evaluation. **The Department of Study Services** consists of the Academic Services Division, the Admissions Division and the Mobility Division, which are competent to organize 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 process and study organization, as well as to ensure the administration and implementation of mobility programmes. The Head of UL Quality control and Internal Auditor also participate in the development, maintenance, implementation, evaluation and improvement of the study quality management system. (Rules of Procedure of the Administration, p.50-51, approved by Resolution No. 1-4 / 559 of the UL Senate of 15.11.2021; available only in Latvian language). By the new UL Administration Regulations, the UL Academic Competence Development Centre is being established within the Department of Human Resources, whose functions will include developing and improving staff development, career and succession planning systems, implementing staff growth promotion measures,

Cooperation with the **students' self-government of the faculty,** which represents the interests of the students in the activities of the faculty, including in solving the issues of the academic, social and cultural environment, plays an important role in the management of studies. Members of the Student Self-government are represented in the **UL Student Council**, thus participating in the governance of the University of Latvia.

**The Study Programme Quality Assessment Commission** (hereinafter - SP QAC) assesses the performance of UL study fields and study programmes, as well as makes proposals to the Faculty Council and UL governance on the further development of the programmes. This commission reviews and provides opinions on study programmes, incl. evaluates applications for 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 applications for new study modules and sub-programmes. 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, Chairman of the Academic Commission of the Senate or his authorized representative, Director of the Academic Department and representatives, Representative of the Department of Study Services, Internal Auditor, Head of Quality, representative of the UL Library, a representative delegated by the Student Council and a representative delegated by the UL Alumni Club.

The management structure of the study field “Geography and Earth Sciences” and the programmes corresponding to the study field fully complies with the regulations on the management of the study fields of the University of Latvia; it is clearly oriented towards the development of the study field. Issues concerning the development of the study field and study quality are regularly discussed in the Council of Geography and Earth Sciences Study Field, which is chaired by its chairman prof. Normunds Stivriņš. In accordance with the Regulations on the Management of the Study Fields of the University of Latvia (Senate Decision No. 70, 27.01.2020), the Council includes the Head of the study field Prof. Ervīns Lukševičs, directors of five study programmes: Director of the Bachelor's study programme “Geography”, assistant prof. Elīna Apsīte-Beriņa, Director of the Master's study programme “Geography”, prof. Agrita Briede, Director of the Bachelor's study programme “Geology”, assoc. prof. Māris Krievāns, Director of the Master's study programme “Geology”, assoc. prof. Ģirts Stinkulis, and the Director of the Professional Bachelor's study programme “Geoinformatics” Arvīds Ozols. There are also four representatives of students of all levels of study programmes, two representatives of employers from public and private institutions, as well as some representatives of the teaching staff of the field. The decisions of the Council are made promptly, for example, by reacting quickly enough to the changing circumstances of the epidemiological situation and by making decisions on the provision of distance learning in various courses, where this was possible and necessary. In general, the management of the study field works effectively, making quick decisions related to the provision and quality of studies. The role of the Head of the study field is mainly manifested in the development of study field development plans, promotion of study programmes development, preparation of annual self-assessment reports and accreditation process documentation, in close cooperation with all directors of study programmes. These documents are carefully analysed at council meetings. The directors of the study programmes ensure the successful and sustainable operation of the study programmes, as well as ensure cooperation with the directors of the study programmes of other study fields.

The support of the administrative staff of the University of Latvia, first of all the clerks of the FGES and the secretary of the faculty, as well as the Academic Department, which ensures all the needs of the study programmes corresponding to the study field, is of great importance in the development of the study field. The management structure of the study field is clearly focused on the development of the study field and the improvement of the programmes included in it. All decisions regarding the development of the field and improvement of the programmes are made collegially and efficiently, allowing to react promptly to the development trends of natural sciences, changes in the demand of the labour market and the need for student-centred education.

**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
- Admission requirements and criteria for undergraduate studies (Only in Latvian)
- Admission requirements and criteria for higher level studies (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
- Regulations of Recognition of Knowledge, Skills and Competence Mastered or Acquired in the Professional Experience During Study Courses and Outside Formal Education, and Learning Outcomes Achieved in the Previous Education in the University of Latvia (Only in Latvian)

The admission process at the University of Latvia and, consequently, also with the study programmes in the study field “Geography and Earth sciences” is regulated by the Admission Regulation 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 requirements and criteria for doctoral programmes;
4. admission requirements and criteria for residency study programmes;
5. admission procedure for the academic year;
6. an estimate of the registration fee;
7. tuition fees in programmes;
8. number of study places for admission;
9. procedure for the development of entrance examination materials;
10. composition of the Admission Committee;
11. composition of the entrance examination boards;
12. date and place of entrance examinations.

Admission procedures vary by study level. **Enrolment in undergraduate studies** is centralized through the 'Single Enrolment in Undergraduate Programmes', which integrates the enrolment in 12 universities in Latvia. The competition for study places is based on the results of the centralized examinations or the secondary education certificate grades of the persons who have acquired secondary education before 2004, who have been exempted from the centralized examinations or have completed their secondary education abroad. In the case of study programmes that do not have relevant centralized examinations, additional requirements for specific grades are set, and the programmes requiring special skills or aptitude set an additional entrance examination. As a result, the applicants are ranked according to their scores. Programmes may provide benefits to the winner of  National Olympiads and other contests (for more information on admission requirements, see the description of each study programme). For example, when enrolling in the Bachelor's study programme “Geology”, the winners of Latvian national or international Olympiads in relevant subjects, Latvian state conferences of student research work in scientific fields of relevant research and competitions organized by the University of Latvia and classes of young specialist schools have

advantages.

**Enrolment in master's degree programmes** is decentralized, at each faculty, but with uniform deadlines. The 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. For example, in the entrance examination to the Master's study programme “Geology”, preliminary knowledge in geology and related Earth sciences, experience in scientific research and professional activity in geology or related Earth sciences, possible topic and implementation of the master's thesis are clarified. While, the admission to the Master's study programme “Geography” is determined by the evaluation of the answers to the entrance examination questions, motivation for study choice, intended research direction, work experience in research, presentation at conferences, internships in foreign universities and research institutions, topicality of the expected master's thesis topic and compliance with current directions of geography research, as well as outlines of the master's thesis.

The requirements and criteria in the study programmes are reviewed and updated annually, and in accordance with Article 46 of the Law on Higher Education Institutions, they are published on the website of the University of Latvia by November 1.

The UL provides an opportunity to commence studies also in subsequent study stages, in accordance with the *Procedure for commencing studies in subsequent study stages at the University of Latvia* (UL order No. *1/128).* A precondition for commencing studies in subsequent study stages is the recognition of previously acquired study courses or knowledge, skills, competencies, learning outcomes acquired 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 (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 (UL Order No. 1-4 / 543 of 04.11.2021). Based on the student's application, the possibility to recognize study courses acquired at another higher education institution in Latvia or abroad or during the previous study period at the University of Latvia is considered. According to Clause 8 of the Regulations, previously acquired study courses may be recognized at the same or lower study level. On 01.10.2021 in the field of studies, there were 58 students from all active students who have their study courses recognized, but since the previous accreditation period from 2015/2016 to 2020/2021 academic year, the recognition of courses was performed for 126 students.

When applying to commence studies in subsequent stages, the application must be filled in and the necessary documents must be attached. The Recognition Committee for the assessment and recognition of competencies acquired outside formal education or through professional experience and learning outcomes achieved in previous education (hereinafter - the Recognition Committee) or the director of the programme, if the student renews their studies in the same UL programme, assess and recognise previously acquired study courses, the learning outcomes in terms of correspondence to the learning outcomes of the given UL study programme. Study courses are recognized if their volume in credit points in both comparable study programmes is equal or if the number of credit points in the previously acquired study course is higher. The total volume of additional study courses may not exceed 20 credit points. The acquisition of additional study courses or taking examinations is a fee service. For students from another higher education institution or college, when commencing studies in the subsequent stages of studies at the University of Latvia, the budget funding for studies is not maintained. Final examinations passed at

other universities are not recognized.

Upon the application of the applicant, the University of Latvia evaluates and recognizes the knowledge, skills, competencies acquired outside formal education or through professional experience, and the learning outcomes achieved in previous education. When submitting an application, documents confirming the achieved learning outcomes must be enclosed/attached - certificates, employer's confirmations, recommendations, project results, job descriptions, etc. The learning outcomes achieved through professional experience may be recognised only for the part of the relevant study programme comprising the internship or for the learning outcomes to be achieved in a study course or study module of a study programme that provide evidence of the practical knowledge acquired. In some cases, to recognize the knowledge, skills and competencies acquired through professional experience as appropriate outcomes of the course of the given study programme, the applicant may be required to take the examinations provided for in the relevant study course or part thereof. For example, in the bachelor's study programme in geology in the course “Mineral Resources Geology” it would be necessary to prove the applicant's knowledge in the calculation of mineral deposits (according to the description of the study course). If the submitted documents do not allow verify such practical skills, the applicant should pass the appropriate practical work indicated in the course description.

Recognition of study courses in the bachelor's study programme most often takes place in the following cases - when the student returns from the exchange programme (ERASMUS + or others), as well as persons matriculated in the bachelor's study programme, may apply for recognition of study courses taken during previous studies, provided that their scope and content are appropriate to the existing courses of the given study programme. Students have every opportunity to recognize courses if they have not succeeded in completing their studies at another university. In these cases, the Recognition Committee compares the scope and content of the previously acquired study courses and makes a decision on the possibility to recognize the study courses. In some cases, previously acquired study courses are recognized for students whose studies in the study programmes of the study field are the second or further higher education programme. For example, if a student has already taken a Civil Protection course while studying in a bachelor's study programme in chemistry, then this course does not have to be taken a second time in the bachelor's study programme “Geography” or “Geology”. Likewise, when renewing studies after a break in studies, courses are recognized following the changes in the study programme plan.

In master's programmes, on the other hand, the recognition of study courses is most often performed in cases when students have returned from mobility programmes, participated in various projects, such as Summer School, or have entered the given programme from other universities in Latvia where they have not completed their studies. In these cases, the programme director or the Recognition Committee compares the scope and content of the previously acquired study courses and makes a decision on the possibility to recognize the study courses.

Students of the Master's study programme “Geography” actively participate in various Summer Schools and other international events, such as NordPlus 2018 intensive course “From rural resource communities to renewable and recreational multi-localities”, which took place at Vilnius University from April 22 to May 5, where two students took part. In the same 2018, two more students took part in the internationally organized interdisciplinary study course “Urban Challenge” at the summer school, which took place from 18 to 29 July in Copenhagen and from 1 August to 12 August in Riga. Three students participated in the NordPlus 2019 intensive course “Changing Colors for the Future? Reimagining Coastal Communities”, which took place in Iceland from 19 to 31 May 2019. In cooperation with the Estonian University of Life Sciences and the professional master's study programme “Spatial Planning”, two students of the Master's study programme “Geography” also had the opportunity to supplement their knowledge, skills and abilities in the intensive courses

“Urban studies and planning”, which took place in autumn 2019 in Turku, Finland. In the same year, two master's students took part in intensive courses organized by the Swedish-Finnish Cultural Centre “Sustainable Cities in the Nordic-Baltic Region”. Students of the Bachelor's study programme “Geology”, in total 5, in 2017 participated in the field course GMIN 3015 “Practical Course in Ore Prospecting” organized by prof. K. Sundblad (University of Turku) in Finland.

The opportunity to recognize learning outcomes from previous education (including further education) or professional experience is less frequently used.

For the UL students who use the opportunity to study or undergo internship within the framework of various international exchange programmes, the recognition and crediting of learning outcomes acquired during mobility is carried out in accordance with the above-mentioned procedure regulating recognition at the University of Latvia, as well as the Procedures for Organising ERASMUS+ Programme Mobility at the University of Latvia (UL Order No.1/363 of 18.12.2014). In accordance with these regulations, the following is taken into account in the recognition of learning outcomes acquired through mobility: 1) compliance of the learning outcomes acquired during the mobility with the conditions of the international exchange programmes and 2) compliance of the learning outcomes acquired during the mobility with the requirements of the study programme at the University of Latvia. The comparison of the learning outcomes acquired during the mobility is performed by the director of the respective study programme or the Recognition Committee on the basis of transcripts from the partner university or confirmation from the place of internship. After assessment, the recognised learning outcomes are filed with the student's fulfilled academic obligations.

All exchange students must agree with the programme director a preliminary mobility plan for their course or placement before going on mobility. If changes are made to this plan during the exchange programme, these will be agreed with the study programme director. Such changes are often made, for example, due to the exchange studies of undergraduate students Tatjana Visotina and Alice Tarusina at the Charles University in Prague in 2020.

The preliminary study or internship plan also stipulates the process of assimilation, the study programme director approves the study courses chosen by the student at the foreign university and notes with which study course from the student's study plan at UL these courses will be substituted or assimilated to. If the student participates in the internship mobility, before going on the mobility, the student agrees with the relevant study programme director on how the internship will be recognized. If the internship is provided for in the UL study plan, then the internship mobility is treated as an internship from the UL programme.

All procedures are published and available in the UL Regulatory System, which is available to all UL employees and students by registering with the assigned username and password.

### 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 “*Procedure for Development and Updating of Study Courses at the University of Latvia”* stipulates that information on the conditions, aims, tasks, requirements for obtaining credit points,

study content, organization and tasks of the students' independent work, planned 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 UL Information System (LUIS) and UL e-learning environment. The recording of the assessment of students' performance takes place in the respective study course e-environment. The UL has formulated the learning outcomes for each study programme and for each study course as a set of knowledge, skills and competencies. The courses in study programmes are developed in accordance with the principles of gradation and succession. To that end, the study programmes map the expected learning outcomes (see annexes “Mapping of study courses of the Bachelor study programme “Geography”, “Mapping of study courses of the Master's study programme “ Geography “, “Mapping of study courses of the Bachelor study programme “ Geology “, “Mapping of the Master's study programme “ Geology”, “Mapping of the Professional Bachelor study programme “Geoinformatics”).

At the beginning of studies in the FGES, students are informed of the organisation and implementation of studies in the relevant study programme, but when commencing the acquisition of each individual study course, the academic staff inform students specifically about the organisation, content, requirements, learning outcomes, examinations and evaluation criteria, as well as explain the integral quality of the study course for achieving the overall outcomes of the study programme. The students can familiarize themselves with the criteria and conditions for the assessment of student achievement and the binding procedures in the course descriptions and e-learning environment, as well as at the beginning of each course during the first lecture when each lecturer introduces students to the course organization, briefly describes the requirements for intermediate assessments and final examinations, describes grading criteria and examination procedures, without changing these requirements and grading criteria throughout the semester.

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

There are two types of assessment in each course: the interim assessment or so-called semester examinations and the final examination. The overall assessment of the acquisition of a study course consists of the overall assessment of interims (not less than 50% of the total score) and the assessment obtained in the examination (not less than 10% of the total score). The tests may be carried out in writing or orally or in a combined form (written and oral). The students' achievements are assessed through tests and the assessment mechanisms corresponding to the teaching methods used in the study process, both during contact lessons and in the organization of students' independent work.

Taking an examination is a mandatory requirement for obtaining credits for the acquisition of a study course. The procedures and criteria for the assessment of interims are determined by the responsible department in accordance with the profile of the study course. The study course acquisition rating is calculated in the UL centralised recording system according to the algorithm specified in the course description, taking into account the assessments obtained in the interims and examination, and recorded in the examination report.

Types of interim assessment include quizzes, individual work, practical work, laboratory work, reports, and other types of work according to the profile of the study course. The number and type of interim assessments are specified in the description of the study course. To be assessed on the

acquisition of a course, the assessment obtained for the examination is to be positive. The acquisition of a course may be positively assessed even if the examination has been failed but this possibility has been specified in the study course description. The overall assessment of course acquisition is calculated in the UL e-studies environment according to the algorithm specified in the course description, taking into account the assessments obtained in interim tests and examinations.

In accordance with the profile of the study course, the requirements for attending classes may also be determined. For example, the presence during the laboratory and practical work is mandatory.

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

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

For the evaluation of students' knowledge, skills and competence in each study course, the 10-point scale criteria described above are used. The criteria for each study course are based on the learning outcomes and assessment descriptions (see *Table 6*) published in “*Procedures for the Development and Actualization of Study Courses at the University of Latvia*”.

*Table No 6*

**Assessment rubrics**

| **Acquisition level** | **Grade notations** | **Explanation** (pursuant to Cabinet Regulations No 141, 512, 240 and the UL Senate Decision No 211 of 29.06.2015) |
|---|---|---|
| **very high acquisition level** | **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 carry out 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 acquisition level** | **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 acquisition level** | **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 acquisition level** | **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 is 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, taking into account the experience of academic staff, by analysing the results achieved by students and the results of surveys conducted over several academic years. Students in the surveys recognise the importance of clearly formulating the outcomes of the studies and defining the evaluation criteria, as well as the regular feedback on student achievements in the study process. In order to ensure this, the academic staff systematically analyse their experience, collaborate with colleagues, analyse student achievements and develop course descriptions by investing the description of the results of studies and their evaluation criteria, thereby providing justification for the assessment.

In evaluating the learning outcomes, the compliance with the basic principles for the assessment as set by Republic of Latvia Cabinet regulations No 141 Regulations on the State Standard for First Level Professional Higher Education of 20.03.2001, No 512 Regulations on the State Standard for Second Level Professional Higher Education of 26.08.2014 and No 240 Regulations on the state standard of the academic education of 13.05.2014 is considered:

- **the principle of openness of the evaluation and clarity of requirements**— the University has established a set of requirements for evaluating learning outcomes in line with the aim and objectives of the study programme as well as the aim and objectives of study courses;
- **the principle of the possibility of reviewing the evaluation** —the University has established the procedures for reviewing the obtained assessment;
- **the principle of mandatory evaluation** —it is necessary to obtain a positive assessment of the content of the entire study programme;
- **the principle of the variety of types of testing used in the evaluation** — different types of testing shall be used in the evaluation of the acquisition of the study programme;
- **principle of conformity of assessment** — in the course of testing, the student is given an opportunity to demonstrate knowledge, skills and competence in relevant tasks and situations. The content to be included in the tests corresponds to the content specified in the

course programmes.

The basic criteria for the evaluation of final papers are determined by the UL Decree No 1/38 of 03.02.2012 *(Amendments: UL Order No 1/69 of 26.02.2015) On the development and defence of the final papers (bachelor's, master's, diplomas and qualifications) at the University of Latvia.* Additional criteria are determined for the evaluation of final papers, which were approved by the Faculty Council on a proposal from the Study Field Council (regulations "On the Procedure for the Development and Defense of the Final Thesis in Geography, Geology, Environmental Science, Spatial Development Planning and Teachers' Professional Study Programs" (available only in Latvian), approved at the meeting of the FGES Council on March 19, 2018). The additional criteria cover the quality of the material presented in the author's report and additional evaluation, taking into account the circumstances that increase the evaluation of the work: the results are published in a peer-reviewed or non-peer-reviewed scientific publication, or the results included in the thesis have been reported at the scientific conference(s).

**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 respects the principles of fair and responsible conduct as stipulated in *The Academic Ethics Code of the University of Latvia,* (UL Senate decision No. 2-3/46 of 26.04.2021) and in the Regulations on Academic Integrity at the University of Latvia, (UL Senate decision No 2-3/48 of 26.04.2021) and publicly available to students of the UL and its staff. According to the regulations, students must adhere to the principles of academic integrity. The following actions are considered a breach of academic integrity:

1. the offering of any material thing of value, pecuniary or other benefit, for the doing or not doing of any act in the student's or another person's academic interest;
2. use of unauthorized aids in the study process or plagiarism;
3. participation in a breach of academic integrity, e.g. team's work on one's own behalf, if it has been defined as teamwork, taking a test in another student's place, signing another student's attendance sheet or other documents in another student's place, etc.
4. giving false information about yourself and your work;
5. unauthorised obtaining of test questions or test tasks;
6. interfering with or obstructing the academic work of academic staff or students;
7. other deliberate action that hinders or obstructs the study process and academic work at the University.

The lecturer of the UL may give an oral reprimand to the student for violation of these Regulations or by notifying the Dean of the Faculty:

1. reduce the grade in the test;
2. ask to re-perform an examination task (on another topic or to perform another task);
3. not to admit to the final examination of the study course to be taken - to request re-acquisition of the study course or a part thereof;
4. to cancel the assessment regarding the acquisition of the course, if the violation has been established before the registration for the next semester;
5. to make a proposal to the Dean of the Faculty to propose to the management of the

University of Latvia to issue a warning about expulsion to the student or to expel the student.

Based on the report of the lecturer of the UL, in addition to the consequences specified in other normative acts of the UL, the dean of the Faculty may:

1. cancel the assessment regarding the acquisition of the study course, if the violation has been established before the registration for the next semester;
2. propose to the management of the UL to issue a warning to the student about exmatriculation or to expel the student.

Within the framework of the programmes included in the study field "Geography and Earth Sciences", practically all lecturers inform students about the principles of academic integrity and the necessity of observing them. In most cases, the academic staff issue a verbal reprimand for violations of the principles of academic integrity, and reports to the Dean of the Faculty of Geography and Earth Sciences are very rare; there have been no such cases in the last six years.

To prevent violation of academic integrity, the UL has developed the Unified Computerised Plagiarism Control System (hereinafter – System), (UL Order No 1/125 of 22.04.2014). The System verifies students' final study research paper (qualification paper, diploma paper, bachelor's thesis, master's thesis, doctoral thesis). The procedure has been established to determine further course of action (UL supplement to Order No 1/125 of 22.04.2014) in the event of plagiarism.

The UL as the developer of the System and its operator constantly updates the System and provides other higher education institutions with the opportunity to use the System on the basis of a cooperation agreement. Currently, based on the cooperation agreement, seven higher education institutions in Latvia, Daugavpils University, Liepaja University, Latvia University of Life Sciences and Technologies, Riga Stradins University, Rezekne Academy of Technologies, University College of Economics and Culture and Riga International School of Economics and Business Administration use the System.

The system automatically compares the final theses uploaded to these university systems, incl. material available on the Internet, and in the event of a certain percentage match, the study programme directors are sent an overview of these test results, whereby the same text snippets from different authors are simultaneously viewed. The programme directors pass this information on to 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 final examination panel for final consideration.

Anti-plagiarism tools have been successfully used since 2014 in the programmes included in the study field "Geography and Earth Sciences". Throughout the period since the introduction of the system, the plagiarism control system has not detected any violations testing bachelor's and master's theses. Over a period of seven years, academic staff managed to detect one case of possible plagiarism in the case of the final thesis project of the bachelor's study programme "Geology". The student was offered to develop a bachelor's thesis on another topic the following year.

The cooperation of several higher education institutions in the field of unified computerized plagiarism control facilitates more effective control of the study process at every higher education institution and in Latvia in general and this system works well in practice, raising the importance and quality of the diploma papers.

## 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 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 and 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 the programmes to be implemented in a predefined form according to predefined procedures, reacting promptly to possible changes in the situation, with quality-related decisions being taken collectively or according to the division of competences. An important methodological tool for quality assurance is the Quality Management System Manual of the University of Latvia, which identifies in detail the practice of the University of Latvia in ESG implementation.

The internal quality management of the study field “Geography and Earth Science” is ensured in accordance with the quality assurance mechanism and procedures established by the University of Latvia (see Chapter 1). Even before the previous accreditation, a system was already in place to enable effective decision-making regarding the improvement and development of the study process. Students, teaching staff, directors of the study programmes, employers' representatives, including employers - graduates - are involved in the management of the study field. In the programmes corresponding to the field, review of study courses is regularly ensured in accordance with the established procedures, regular mandatory student surveys (every semester) and their evaluation, student surveys on the quality of the study course, as well as surveys on the organisation of the study process, which have become especially topical due to the COVID-19 pandemic, are conducted on the initiative of the study programmes directors.

Student surveys on the quality of study courses and the organisation of the study process are conducted every semester, after each course: students are required to complete an evaluation questionnaire for each course and a programme evaluation questionnaire at the end of the academic year. The evaluation of survey results facilitates the process and quality control of study processes by providing more feedback on the quality of the study process. The results of the surveys are summarized and evaluated by the director of the study programme for improvements in the respective programme and study courses. Round table discussions involving students, dean and programme directors are also organised annually in the autumn and spring semesters to identify students' views on programmes and the implemented study courses, summarizing students' suggestions for improving the course content and organization, thus contributing to reducing drop-out rates and improving overall success. Alumni surveys on the quality of study programmes are usually organised every three to four years. In order to improve the communication and information process for students, a lot of work was invested in the maintenance of the Faculty's website and the use of social networks such as Facebook during the reporting period; person responsible for the immediate placement of information in the relevant information channels is approved in the FGES. Taking into account the 2020-2022 pandemic situation, the importance of distance learning has increased significantly, and was based on the MS-Teams

platform, which allows for effective quality control of studies.

Employers are extensively involved in the development and implementation of the programmes included in the field of study, especially in the case of the PBSP “Geoinformatics” and the Bachelor's and Master's study programmes “Geology”. The proposals expressed by the employers are taken into account in the development of study content, and employers also participate in the implementation of some study courses and classes.

There is good cooperation between the teaching staff involved in the implementation of the study programmes, including mutual appraisal of lecturers (hospitation) in the departments of Geography and Geology and regular evaluation of teaching staff in the Faculty departments. The study courses are updated regularly, at least once a year, and the organization and quality of the study process is discussed at departmental meetings, inviting representatives of employers if necessary, as well as in the study field council, discussing the situation with courses included in several programmes.

During the reporting period, a number of the UL normative acts were updated and the necessary procedures were improved, student surveys were improved, academic staff were trained and their qualifications were enhanced, which allowed increasing the number of survey respondents and, consequently, the objectivity of the survey results. The introduction of regular meetings with student representatives has increased student involvement in the quality assurance system and, according to student surveys, overall satisfaction with the organisation, content and environment of studies has increased. Therefore, the assessment of the effectiveness of the internal quality assurance system within the field of study in the reporting period is generally positive.

**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).**

The quality of the field of study and its study programmes is managed through a Plan-do-check-act or the 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 Development Strategy, 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.

**The framework of the quality assurance system** (see Fig. 5determines planning, monitoring, evaluating and reviewing the development of the study field and the interconnectedness and affinity of study programmes, the establishment of new study programmes, as well as the results of each existing study programme while 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 for preparation of the annual reports of the study fields of the University of Latvia (UL Order No. 1/290 of 14 July 2020).

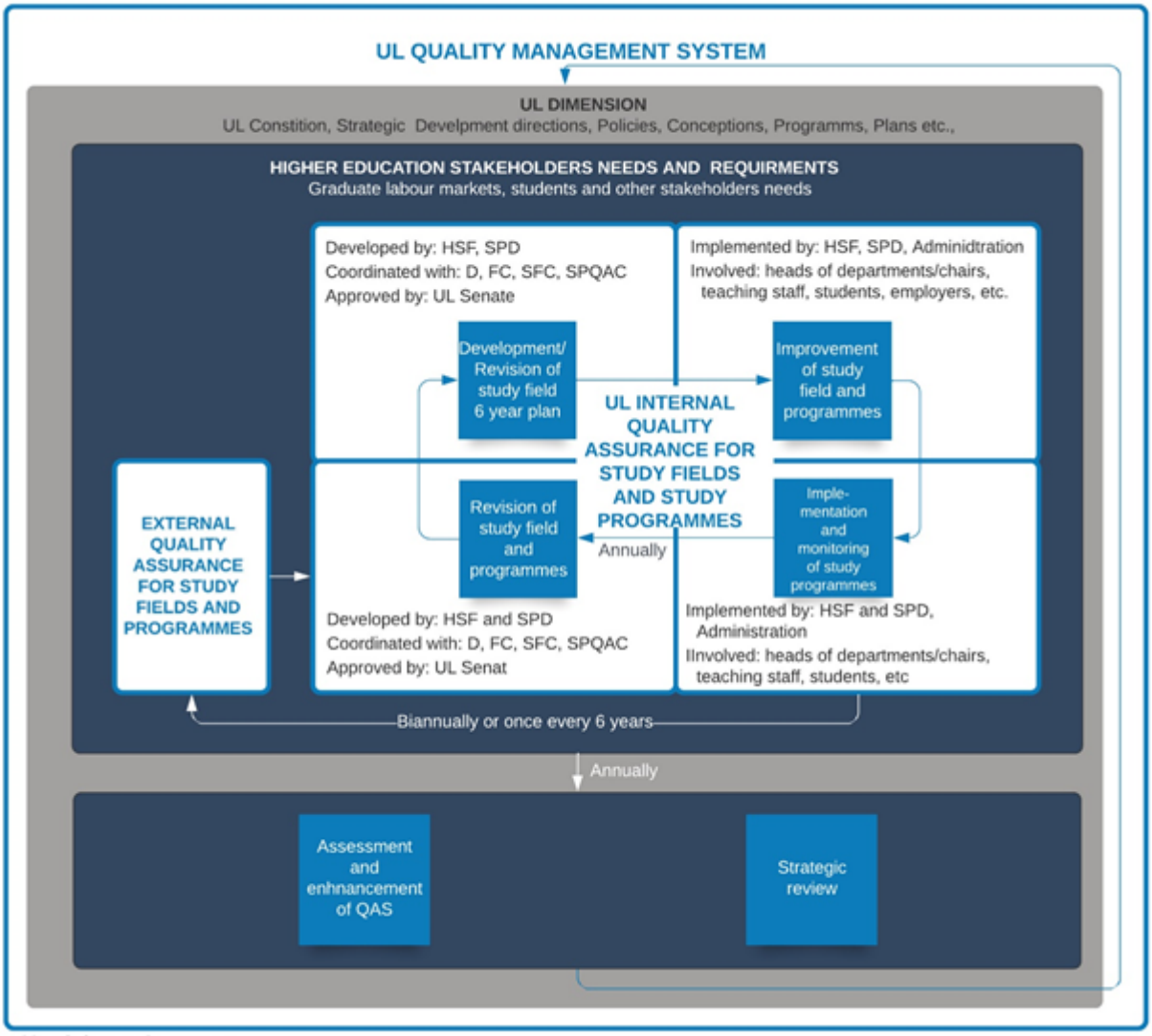


*Figure 5. Quality assurance system for the study fields implemented by the University of Latvia and the study programmes included therein*

The development of new study programmes is regulated by the Regulations of Study Programmes and Continuing Education Programmes of the University of Latvia (approved by the UL Senate Decision No. 102 of 24.04.2017), it is implemented twice and in several stages, including coordination and evaluation 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 System Manual, Chapter 3.1, Section II.

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

UL study field coordinators in cooperation with the directors of study programmes, prepare annual study field self-assessment reports (hereinafter - Self-assessment report) (procedure approved by UL Order No 1/373 of 16.09.2016.). Self-assessment reports are approved by the Faculty Councils and submitted to the Academic Department. The Academic Department checks self-assessment reports for compliance and submits the same to the SP QAC composed of all Vice-Rectors, the Chair

of the UL Senate Academic Committee, the UL Students' Representative, the UL Alumni Club Representative, the UL Library Representative, the Quality Manager, the Internal Auditor, as well as representatives of the Academic Department and the Department of Study Services. The self-assessment reports reflect the implementation of the programmes, developments, newly introduced changes and evolution of the same as well as the assessment by stakeholders, both, in terms of student survey results and the assessment expressed by employers. In the process of self-assessment of study programmes, as well as development of a new study programme, the Academic Department also provides independent expertise, the implementation of substantiated proposals of which is considered at the SP QAC meeting. Accreditation self-assessment reports are prepared using the annual self-assessment results. The recommendations of the Accreditation and Licensing Evaluation Expert Group and the Study Quality Commission are evaluated by the 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 Manual.

During the reporting period, a professional bachelor's study programme “Geoinformatics” was developed within the study field. This has been driven by the rapid development of the sector in Latvia and worldwide, as well as the increasing demand for quality geospatial data, the results of its analysis and publication on the World Wide Web, making it necessary to organise targeted professional training for specialists involved in the production, analysis and publication of this data, as required by the Geoinformatics Engineer Standard. None of the Latvian universities trained specialists who acquire, analyse, visualise, model, transform, manage geospatial data, develop and build geospatial data structures, design geospatial data infrastructure; work with and customise standard software tools; ensure interoperability (integration) of geospatial data and systems; solve problems using a geospatial approach; working independently, in a team or as a leader[1]. Therefore, the Professional Bachelor's study programme “Geoinformatics” will ensure the acquisition of the knowledge, skills and competences necessary for this field and its future successful application in the labour market, as well as contribute to the increase of competitiveness.

The establishment of new study programmes at the UL is carried out in accordance with the procedure laid down in the Regulations on Study Programmes and Continuing Education Programmes of the UL and includes the following stages:

- Development of a study programme concept in consultation with the Vice-Rector and the Dean of the Faculty and its approval by the Faculty Council;
- Evaluation of the study programme concept with the involvement of experts and approval by the Study Programme Quality Assessment Commission (SP QAC);
- Development of a full-length study programme, evaluation with the involvement of an expert, and approval by the Faculty Council, the SP QAC and the Senate.

The development of the Professional Bachelor's Study Programme (PBSP) “Geoinformatics” started with the creation of a concept. The concept was developed with the participation of the faculty members of the FGES and the Faculty of Computer Science FCS), external experts, employers (including Arvīds Ozols (Latvian Geospatial Information Agency), Māris Kuzmins (JSC Latvijas valsts meži)), as well as students. The Concept was approved at the meeting of the SP QAC on 7 February 2020. The following participants took part in the process of developing the full-length study programme:

- Academic staff of the FGES and the FCS;
- Consultative support and alignment of the study programme content with the current labour

market requirements were provided by leading experts of the Latvian Geospatial Information Agency (LGIA), experts of the State Land Service, Rural Support Service, Latvian State Forests (LVM), the largest Latvian map publisher – "Karšu izdevniecība Jāņa sēta Ltd", as well as representatives of industry professional associations, including the Latvian GIS Society;
- Employers (including LGIA, LVM, "Karšu izdevniecība Jāņa sēta Ltd", "Metrum" Ltd) and graduates participated in the preparation of internship assignments;
- Students whose involvement is ensured by collecting the results of surveys of graduates of the Bachelor's and Master's degree programmes "Geography", as well as by assessing students' feedback on labour market opportunities.

The PBSP "Geoinformatics" (code 42442) was developed and licensed on 4 August 2021 (Licence No 04047-128). Students started their studies in this programme in September 2021.

[1] Professional Standard for a Geoinformatics Engineer

**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.**

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

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

To improve the quality of studies, students have the right to submit proposals and complaints concerning the study processes, including the evaluation of examinations and finals. To ensure the quality of the UL study process, the UL has developed and implemented "*Procedure for the Submission and Resolution of Students' Proposals and Complaints" (UL Decision No 1/21 of 18.02.2002.)*. The procedure specifies the form for the submission of proposals and complaints, as well as the procedure for registration and resolution thereof. Proposals and complaints regarding the study process may be submitted to faculty deans (on the schedule of lectures, on the study process implementation, on the quality of studies administered by the respective faculty and on its development, on the non-fulfilment of the duties of faculty staff, etc.). The initial complaint should be acknowledged, and a full response provided within 15 days or within 30 days if additional information is required. Significantly, paragraph 17 of that order expressly provides that: "At the end of each academic year, the Dean must report to the UL Board on the complaints received and decisions taken in the previous academic year." This demonstrates the importance of the internal control mechanisms and the cyclical monitoring of complaints, decision making, student rights and

interests, which is important for the proper functioning and possible improvement of this system. Students of the FGES are familiarised with the procedure for submitting and reviewing proposals and complaints in their respective courses (Introduction to Geography Studies; Introduction to Master's Studies in Geography; Introduction in Bachelor's Studies in Geology) and are reminded of this procedure at the regular meetings between the Dean and student representatives-+++.

The "*Procedure for the organisation of study course examinations at the University of Latvia" (*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 interim and final assessment and the procedures for resolution of these complaints have been determined. The complaint is submitted by the student to the member of academic staff who has evaluated the examination, 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 submit the application to the Head of Department for consideration and decision.

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

The University of Latvia 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 ex-matriculation in conformity with *"University of Latvia state budget subsidized study place competition (rotation) procedure"* (UL Senate Decision No. 381 of 24.05.2010). In its turn, "*Procedure for Application for Tuition Fee Discounts* (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 University of Latvia, to be considered by the Rector within one month.

The "*Procedure for Discontinuing Studies at the University of Latvia*" (Senate of the University of Latvia Decision No.178 of 01.12.2008) provides for the right to appeal against the decision of the Dean refusing to grant a student a study break. The "*Procedure for the commencement of studies in the subsequent stages of studies at the University of Latvia"* (UL Order No. 1/128 of 08.06.2009) also 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 University dormitories, the I*nternal Regulations of the University of Latvia Dormitorie*s (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 dormitories. Hostel and catering issues are addressed by the hostel superintendent.

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

The proposals and complaints as well as outcomes of the enquiry taken and respective resolutions

are registered with the departments or commissions where they are submitted.

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

It follows from the above that the centralized segment of the UL Complaint and Proposal Submission and Review System covers all the components of every student study life as it applies to the enrolment at the UL, to the full-cycle studies and to the final examinations.

During the reporting period, no complaints were received from applicants regarding the programmes represented in the field of study. In order to improve the quality of studies, in the autumn semester of 2020, a group of students submitted a complaint about the organisation of studies and the assessment of practical work in one of the Bachelor's degree courses, as well as a proposal to involve another lecturer for more objective assessment of practical work and students' results. The complaint was addressed to the Dean; the Dean, the Director of the study programme and the lecturer of the course were involved to clarify and resolve the situation. The answer was provided within the timeframe stipulated in the regulations, discussions with students were organised, the work was re-examined, and the study field Council decided to find a solution by the beginning of the next semester in order to prevent similar conflicts from developing in the future. As a result, it was decided to develop another course with similar content and to involve other lecturers. No appeals were lodged during the reporting period in relation to the theses.

**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:

- characterizing the number of applicants and matriculated students and their profile, such as secondary education institution, year of institution graduation, assessment obtained in secondary education examinations, age, gender, previous higher education and the assessment obtained in such 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 — ex-matriculated on the grounds of academic non-compliance, ex-matriculated on the grounds of financial non-compliance, ex-matriculated on the grounds of completion of studies, on academic leave.

In order to control the progress of students' studies and the implementation of the programme, the UL collects data on:

- intermediate assessment and final assessment of students' study courses, broken down by type of examination, final results of final examinations, weighted average mark; 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

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

In order 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, UL-funded and student-funded study places;
- the number of student scholarship recipients and the number of studies and student loans;

In order to prevent violations of the principles of academic integrity in the UL students' final theses and promotion papers, the UL ensures automatic examination of all submitted final theses and doctoral theses by using the unified computerized plagiarism control system, making a mutual comparison with the final theses of the University and other higher education institutions accumulated in the System.

Anti-plagiarism tools have been successfully used since 2014 in the programmes included in the study field “Geography and Earth Sciences”. The system has not detected any cases of plagiarism in seven years.

In order 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 organizes and compiles data from the following surveys:

- a survey at the start of studies, which is conducted electronically once a year. The survey aims to obtain information for the improvement of student attraction activities. The tasks of the survey are: (1) to find out students' motivations for choosing a university and study programme, (2) to find out sources of information about studying at the University, (3) to obtain an assessment of the application and registration process, and (4) to determine the socio-demographic portrait of respondents who have started their studies. Data on each study programme are collected by LUIS, but for the University as a whole data are collected and analysed by the Academic Department. The results of the survey are presented to the UL management, departments and faculty management, and the necessary improvement measures are proposed by the UL management, faculty management and programme directors in cooperation with the Academic Department;
- a freshman survey of the first-year students on the first study experience, also conducted electronically once a year. The survey aims to obtain information for the improvement of the study environment and the promotion of student adaptation. The tasks of the survey are: (1) to find out students ' opinions on different aspects of studies and (2) to find out students' opinions about what support is needed when starting studies. Data on each study programme are collected by LUIS, but for the University as a whole data are collected and analysed by the Academic Department. The results of the survey are presented to the UL management, departments and faculty management, and the necessary improvement measures are proposed by the UL management, faculty management and programme directors in cooperation with the Academic Department;
- In order to find out students' opinions about the content of the study courses and to obtain the evaluation of the work of the teaching staff, every semester an electronic survey is conducted on the study courses, including study internship, term papers and final papers. Data on each study programme are collected by LUIS and are available to the teaching staff,

programme directors, the dean of the faculty, and the Academic Department. The data is analysed by the programme directors, the dean, and the necessary improvement measures are proposed by the programme director, the dean, and the Study Field Council. The results are used to prepare annual reviews of study fields, as well as to develop study programme development plans.

- In order to obtain students' evaluation of the study programme for its further development, improvement of the study process, improvement of the quality and study environment, a survey of the students of the last study year on the study programme as a whole is conducted. The survey is conducted electronically once for each study programme. The data collection on each study programme is performed by LUIS and is available to the programme directors and the dean of the faculty. The data is analysed by the programme directors, the dean, and the necessary improvement measures are proposed by the programme director, the dean, and the Study Field Council. The results are used in the preparation of annual study field reviews, study field self-assessment reports for the field accreditation and re-accreditation, and in the preparation of study programme development plans.
- In order to identify the main reasons for discontinuation of studies and to facilitate the reduction of drop-out rates, a survey of students who have expressed a wish to discontinue studies or have already discontinued studies is conducted. The survey is conducted electronically (in some cases in paper form) throughout the academic year. Data are collected and analysed by the Academic Department once a semester. The results of the survey are presented to the management of the University of Latvia and the management of the faculty;
- The aim of the alumni survey is to obtain an assessment of alumni satisfaction with the quality of the programme, the knowledge, skills and competencies acquired at the University, the contribution of the graduate programme to their employment, as well as their plans to continue their studies. The survey is carried out by the programme directors at their discretion using a questionnaire prepared by the Academic Department;
- The aim of the employer survey is to determine how employers assess the relevance of the knowledge, skills and competencies acquired by graduates of the University to the requirements of the labour market. The survey is carried out at the discretion of the programme directors using a questionnaire prepared by the Academic Department.

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, drop-out 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 as a whole.

Student evaluations and comments in surveys about the programme and specific courses are an important source of information for improving the quality of the programme and courses. For example, the criticism and low marks expressed by students in the master's study programme “Geology” was one of the criteria for the exclusion of the study course “Geological Research in the European Union” from the study programme.

The graduate surveys provide insights into the views on the longer-term development of the study programmes. Since the previous accreditation period, all study programmes have strengthened their applied study courses and brought the content of practical and laboratory work even closer to the requirements of the labour market. Future surveys should, however, make a distinction regarding the graduates who have completed programmes in most recent years. This is to better understand the views on the content of the current programmes rather than on the situation in previous years. For example, the opinions of recent graduates of the Master of Science in Geology programme on the content, learning environment and quality of the programme are significantly better than those of graduates from previous years. This is probably due to the fact that the alumni surveys were mainly completed by 2014 graduates or earlier, whose views could not be separated from those of recent graduates.

Employer surveys help to identify the relevance of graduates' qualifications to labour market requirements, which change over time, as well as the need for specific knowledge and skills that could be developed during the study process. For example, employers highlighted in a survey conducted during the previous accreditation in 2016 that graduates of BSP and MSP Geology programmes lack practical skills in applied geology and need to acquire the knowledge and skills they need to work in a company. Employers' criticism has been taken into account by including applied study courses in all programmes of study, where skills can be acquired by working with companies. Employers' criticism of graduates' lack of or insufficient skills in applied geology is also expressed in the 2021 survey. Both the small number of respondents and the uncertainty about the graduation time of the assessed graduates are major problems that reduce the objectivity of these evaluations.

Based on several sources of information, including surveys of students, graduates and employers, a number of improvements have been made to study programmes since the previous accreditation. For example, Part A of the MSP “Geology” has included a course on “Contemporary Geological Processes”, which addresses a number of issues in applied geology, such as geological hazards. Part B of the programme has included a course on “Exploration Methods of Quaternary Mineral Deposits”, which is relevant to current developments in applied geology. Teaching staff in applied geology fields improve practical and laboratory work in hydrogeology and engineering geology year after year, as well as purchase new laboratory equipment to equip students with the skills they need for the labour market, e.g. the course “Geology of Mineral Deposits” has introduced practical work on mineral exploration and reserves calculation using GIS software and geological modelling methodologies that are in line with the working practices of companies in the field. In the academic year 2020/2021, the Bachelor’s study programme “Geography” has made changes in the semester-by-semester course planning and improved the study plan, taking into account the recommendations of the students. A new study course “Political Geography in the Changing World”, 4 credits (hereafter CP), Part B, semester 5 was created. The course “Population and Settlement Geography”, 3 CP, Part B, has been moved from Semester 3 to Semester 4 in order to balance the student workload. In addition, a fundamental addition has been made to the Part B restricted elective courses in the academic year 2021/2022. In the third semester, a new course “Geographies of young people in the everyday spaces of activity”, 3 CP, has been added, which is a problem-oriented course relevant to a young audience, and a new course “Data processing in CAD environment”, 3 CP, due to the importance of skills in using this software in the labour market. In

the third year, a new interdisciplinary course “Spatial Analysis for Sustainable Cities and Societies”, based on the experience gained at a foreign university, has been introduced; young specialists have been recruited to teach the course. In addition, an interdisciplinary course “Polar Geography”, 4 CP, and “Fundamentals of Tourism Geography”, 2 CP, are included in the study plan in the 6th semester. Polar research has increased rapidly in the last decade due to the issue of global climate change, and this research has also been developed in Latvia. The creation of the Polar Research Centre within the FGES has contributed to better visibility of the research team and international cooperation, so the creation and inclusion of a dedicated course in the programme “Geography” provides students with opportunities to better understand the spatio-temporal interactions between the evolution of natural processes and human activity. A course in the geography of tourism was once excluded from the programme because of the need to consolidate it, but issues related to tourism development are still relevant, so it was decided to create and include it in the programme.

**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 referred to as the website) is the UL prospective and existing students, employees, cooperation partners, scientists and the general public.

The site 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 site consists of the following sections:

- ROTATING NEWS - important information of the University of Latvia through the visual identity of the University of Latvia, which has certain parameters and strengthens the image of the University and promotes its visibility in the digital environment.
- NEWS AND EVENTS - News and events at the University. Information prepared by UL departments and the Department of Communication and Innovation.
- 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 Communications Department in cooperation with the Academic Department and the Department of Study Services.

The STUDIES section in Latvian provides information on programme goals, objectives, study outcomes, programme volume and duration, programme study language, information on job opportunities after graduation, as well as programme study plans. If you have any questions, please

contact us for further information. This section also publishes study-relevant information under the heading STUDY PROCESS - Academic calendar, Lecture timetable, Tutorials, Key documents and forms, Information on mobility at higher education institutions, Recognition of experience/education, Lifelong learning opportunities as well as references to UL e-learning environment and LUIS information system.

The section contains information about the University of Latvia Libraries offer, Career Centre information. Student Council activities.

The two subsections STUDENT LIFE and EXTRACURRICULAR ACTIVITIES inform both existing and potential students about hostels, meals, 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 school pupils, prospective and existing students. In this section, the pupils can get acquainted with the events and creative competitions organized by the respective faculty, the participation wherein and successful performance can give additional admission points. The prospective students may get introduced to the information on all levels of programmes, admission requirements, credit and scholarship information, as well as opportunities for the recommencement of studies. The prospective students will be able to look into the most frequently asked questions and answers, information on Career Centre activities, preparatory courses and classes for school pupils.

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

The website www.lu.lv/par-mums/dokumenti/pasnovertejuma-zinojumi/ (*only in Latvian*) contains annual study fields self-assessment reports.

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 exactly the same as the ones on the UL official site, but more specific information is posted directly about the respective faculty activities.

The faculty website can be reached from the UL website via the faculty reference. The website www.geo.lu.lv (*only in Latvian*) STUDIES provides information specific to the Faculty of Geography and Earth Sciences, including study brochures, which are regularly updated. The STUDIES section contains information for students about studying at the University and abroad, and information for teachers. The RESEARCH section contains comprehensive information on doctoral schools, research projects and programmes, defended doctoral theses, the map service, UL conferences, and faculty publications (e.g. "Folia Geographica"). The TRADITIONS section contains information about the traditions of the Faculty family, the Latvian Geographical Society and the Latvian Quaternary Research Association (LatQUA). Like the homepage of the University, the website of the FGES includes an extensive ABOUT US section with information about the Faculty's departments, cooperation partners, Student Council, alumni information, as well as alumni success stories.

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

The heads of the UL departments are responsible for the preparation, accuracy and updating of the information within the competence of the departments they manage. The content administrators of the structural units' websites are responsible for maintaining the website, posting the updated information and updating it regularly. 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 ITD management.

## 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 University of Latvia for financing the study field and the corresponding study programmes is based on the "Law on Higher Education Institutions", Cabinet of Ministers Regulations No. 994 of 12.12. 2006 "Procedures for Financing Higher Education Institutions and Colleges from the State Budget", Cabinet of Ministers Regulation No. 445 of 05.07.2016 "Regulations on Remuneration of Teachers" and other external and internal regulatory enactments.

For the successful implementation of the study fields the University of Latvia 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 organization 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 exam costs;
- Costs of methodological work (preparation for lessons, preparation of new courses, etc.);
- Student work management and evaluation costs, including reviewing;
- Internship management and organization costs;
- Costs of scientific work of the teaching staff to ensure the development of new study materials.

The norms of the formation of the remuneration of the teaching staff (norms of the planning and accounting of the workload of the academic staff) are determined by the order of the Rector for the entire university. Taking into account 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 organization of the study process:

- General staff costs include the remuneration of staff supporting the implementation of studies, organization 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, transport, 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, staff, marketing, etc.) and investment in development. In order to estimate the amount of funds required for financial provision, the University of Latvia calculates the cost of each study programme according to the methodology developed by the University of Latvia, 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, etc., thus ensuring the reliability of the forecasts.

**Financing of studies at the University of Latvia - sources of financing**

To provide the necessary funds for the conduct of studies, the University of Latvia uses (1) the state budget subsidy (taking into account the base funding, programme level and field of study) from the Ministry of Education and Science and (2) tuition fees.

Tuition fees at the University of Latvia are determined taking into account:

- the cost of a study place, including all costs of the study process;
- tuition fees for similar programmes at other universities;
- the interest of potential fee-paying students in the study programme;
- the estimated funding per study place from the national budget;
- the opinion of the UL Student Council;Tuition fees are set at the end of each year for the next academic year to ensure timely availability of information. The tuition fee 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.

The research activities of the FGES are financed from several sources: the base and performance funding granted to the University of Latvia as a scientific institution, faculty contract research, projects funded by the Latvian Council of Science, state research programme funds, international projects, as well as from the faculty's own income and from the state subsidy. Base and performance funding at the University of Latvia is granted in accordance with Cabinet Regulation No. 1316 “Procedures for Calculating and Granting Basic Funding to Scientific Institutions” as of 12.11.2013, while the internal regulatory enactments of the University of Latvia determine the amount of funding for each structural unit, for example, the base and performance funding allocated in 2020 was distributed among the structural units of the University of Latvia in accordance with Order No. 1/241 “On the Use of the Funding and Performance Funding of a Scientific Institution Granted at the University of Latvia for 2020” as of 18.06.2020. Likewise, the research staff of the faculty can apply for centralized support in accordance with Order No. 1/148. According to the regulations on “Approval of the Procedure for Supporting the Development of Scientific Activity” as of 20.04.2018, support is available for: participation in international events, publication of scientific articles, preparation of international project applications, organization of scientific activities at the University of Latvia, implementation of scientific development projects and long-term commitments. In order to facilitate the preparation of international project

applications, on 29.11.2019, the UL issued Order No. 1/435 “On approval of the use of unit costs”, which provides additional funding for the development of international project applications. By participating in these events, academic staff enhance their professional and research competence, often involving students as well, which has a positive impact on the quality of the study process.

Research funding also contributes indirectly to the development of the field of study by ensuring an increase in the number of printed media and electronic books, subscriptions to major databases whose materials are used in students' research and final theses, and the development of the most up-to-date teaching aids.

Each year, the Faculty's financial resources are planned to include funds for teaching, work and academic trips. These funds are used to pay for students and staff  academic trips to participate in international conferences.

The Faculty implements a number of study and research projects, which ensure the adoption of best practices from cooperation partners, improvement of study quality and exchange of experience. The funding of the student self-government is also important, as it complies with Article 53 of the Law on Higher Education Institutions and is not less than one two-hundredth of the annual budget of the university. The Student Council is financed from central funds of the University in accordance with the Law on Higher Education Institutions, while the Faculty provides the Student Council with the necessary premises (infrastructure).

For data on available funding for a specific study programme, see section 3.2. of the report concerning the relevant programme.

**Financing of studies at the University of Latvia - reallocation of received funding**

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

Faculties manage their own funding within the current year's budget. The Dean of the Faculty and the Executive Director are responsible for the rational use of financial resources and for operational financial management.

Actual returns are recorded at the faculty level, without separating results for each programme or field of study. 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 cost of a particular programme with the state budget subsidy and tuition fees and, if necessary, makes the necessary adjustments in the organisation of the study process to ensure the long-term feasibility 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.**

The infrastructure of the Bachelor's and Master's study programmes “Geography” and “Geology”, as well as the professional Bachelor's programme “Geoinformatics”, the Doctoral programme in

Natural Sciences (Geography) and the Doctoral programme in Natural Sciences (Geology) during the reporting period consisted mainly of the common infrastructure base of the FGES. The most significant improvement in the study and research infrastructure was achieved with the move to the new Academic Centre for Natural Sciences in Torņakalns in August 2015. It is the most modern university building in the Baltics, with classrooms and seminar rooms, teaching and research laboratories, and state-of-the-art technological equipment. The construction of a new study and research centre in Torņakalns has created opportunities to provide good working conditions for staff and an experimental base for studies.

The total indoor area of the Academic Center for Natural Sciences is 18 540 $m^2$, it has a total of 30 auditoriums, 45 student study laboratories and 69 research laboratories. Both Windows and Linux operating systems are available in the computer classes. Microsoft Office applications, statistical programs (R, SPSS, PC-Ord), geoinformatics-specific programs (ESRI ArcGIS, QGIS, PostgreSQL/postGIS, Bentley MicroStation, etc.) are available. All auditoriums have a projector and a laptop for presentations, whiteboards. Interactive whiteboards are also available in some auditoriums and laboratories. The Academic Centre provides wireless network coverage. The building has a cafe, Natural Science Library, individual work booths. The building is accessible to people with disabilities - the building has several elevators, appropriate sanitary facilities. The first two floors of the Centre are available 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 (Map Library, laboratories of Remote Sensing and Cartography, Soils, Rock Studies, Quaternary Environment, Engineering Geology and Hydrogeology, Mineralogy and Palaeontology) has been improved in order to ensure studies and to participate in the implementation of scientific grants, cooperation projects and EU Structural Funds projects. The accessibility of Latvian cartographic and spatial materials is continuously (24 hours a day, also remotely) ensured by the Map Browser created, maintained and continuously updated by the Faculty. All study laboratories are freely accessible to students and teaching staff, while access to research laboratories is possible upon agreement with the staff in charge. Practically all the material and technical equipment necessary for the implementation of all five study programmes is at the disposal of the University, with the exception of heavy drilling units based on self-propelled vehicles or trucks, which are necessary only for the implementation of the Bachelor study programme “Geology” study course “Engineering Geology”. Reconnaissance of such equipment is organized in cooperation with private companies within the framework of cooperation agreements. The Faculty is continuously improving the range of available equipment; the FGES has several drones, including a DJI Mat-rix600 with multispectral camera and interchangeable cameras, several real-time GPS receivers, surveying equipment, rock processing and analysis equipment, etc. For the implementation of certain bachelor’s and master’s thesis the material and technical equipment at the disposal of other units of the UL, for example, electron microscopes at the disposal of the Institute of Chemical Physics and other units of the university, is also used. Thus, it can be concluded that all the necessary material and technical support is available for all study programmes included in the study field in order to implement the study process qualitatively. Within the framework of the UL and the FGES , a unified, successfully functioning system and well-known procedures for the acquisition and development of materials, equipment, methodological, informational, etc. provision have been established.

**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.**

***General description of the UL Library***

The Library of the University of Latvia is included in the Library Register of the Ministry of Culture (BLB1000) and accredited as a library of national significance till 2022.

***Access to UL Library information resources and services, opening hours***

The basic principle of the library is the availability of its services to every user.

The services are provided in the 8 branch libraries of the University of Latvia Library in accordance with the regulations for the use of the University of Latvia Library (07.01.2021. *Order of the Rector of the University of Latvia No. 1-4 / 9).* According to the terms of use, the services can be used by UL students, lecturers, staff, other libraries, students of other universities, as well as any resident. The UL Library provides free basic services and fee services.

The opening hours of branch libraries are tailored to the convenience of users. On weekdays from 9.00-20.00, in some branch libraries from 9.00 – 18.00, Saturdays from 9.00 -17.00 The House of Nature Library and the House of Science Library are available 24 hours a day, 7 days a week. Three branch libraries are open to customers all year round, including during the summer.

In the Natural Sciences Library, the staff of the University of Latvia can use the following facilities 24 hours a day: free access to the collection, self-service facility for home delivery of books, renewal and check-out, computers, mobile phone charging. In the House of Science Library, the following facilities are available to UL staff 24 hours a day: free access to the collection, two self-service facilities for home delivery, renewal and check-out of books, and a self-service wall for the use of laptops. The UL Library is the first in the Baltic States to provide such facility and service. The self-service facility is equipped with 36 laptops. UL staff can check out the laptops at any time of the day and use them for 6 hours, not only in the library area, but across the entire building, using student or employee ID cards.

The premises of the Natural Sciences Library, which houses the collection of the Geography and Earth Sciences branch, are open to students at a convenient time 168 hours a week. Users have access to the open-access collection. The Natural Sciences Library is located in four connected rooms with a total area of 662.8 m². More than 100 workplaces are available for users, including 20 computer workstations.

***Free basic services***

- Electronic ordering/reservation/renewal of information resources in the Collections Catalogue (hereinafter - the Collections Catalogue) of the national libraries and obtaining information resources for use on-site in the library's reading room or to take home.

The service is available to users registered with the UL Library via the Union Catalogue from any mobile device and from any location with internet access.

- Delivery of information resources

Academic staff, researchers and doctoral students of the University of Latvia, when ordering information resources from any library, can specify the most convenient place to receive the reserved information resource - the branch library. For other users, this option is available only when ordering information resources from the Repository.

- Self-service

Self-service scanning is available in all branch libraries. 5 branch libraries have self-service facilities for checking out/returning/renewing books. The House of Science Library has a self-service computer wall with 36 laptops.

- Use of open access reading rooms, computers and the Internet

In the reading rooms, it is possible to use a collection of reference literature and periodicals, desktop and portable computers (both UL Libraries' and users' personal), Internet connection, including WI-FI, which operates in all UL buildings. The Natural Sciences Library has more than 100 workplaces available to users (20 computerized and more than 100 workplaces without computers).

- Night subscription, booking of information resources

The purpose of the "Night Subscription" service is to provide an opportunity to use certain information resources outside the University of Latvia Library free of charge from the time of its closure until its opening. The information resource can be reserved in advance for certain hours. If the information resource is not transferred on time, a contractual penalty is applied for the delay in its term in accordance with the price list of fee services of the Library of the University of Latvia.

- Delivery of information resources in summer

Once a week, users can receive the information resources reserved in the Union Catalogue from the Repository in the most convenient branch library (Library on Raina Boulevard, Library of Natural Sciences, Library of House of Science).

- Inquiries and consultancy

Information service for users - consulting, reference, training and research support is one of the main areas of work of the University of Latvia Library. The consultant of the Library of the University of Latvia and the staff of branch libraries provide bibliographic, thematic, factual, address, clarifying and other references and consultations to the students, academic, scientific and general staff of the University of Latvia.

The Chief Reference Consultant of the University of Latvia Library (Library on Aspazijas Boulevard) provides the official and general information service of the University of Latvia Library. Users are consulted electronically: info-bibl@lu.lv, by phone: 28623551, WhatsApp 28623551 via Skype - address: UL Library Consultant. Advice is also provided by any member of Library staff on-site at the library or by phone via Skype.

In case of uncertainty, users can also use the options available in the Library section of the UL portal: "Ask a Librarian", "Frequently Asked Questions", "Have Your Say".

- User training

The training is organized with the aim of developing users' skills to work independently, to find, evaluate and use information resources and e-environment tools. The library actively works with

target audiences - students of all study levels, academic, scientific and general staff to promote not only information literacy, but also to provide in-depth knowledge and skills in working with electronic resources.

The library organizes and conducts presentations, classes in classrooms and computer classes, as well as remotely; organizes practical study tours in the Library so that users acquire the skills to work with open access stock, self-service equipment and office equipment - self-service scanners, copiers, thus improving the competence of independent learning.

Special attention is paid to foreign students. The library has prepared and conducts presentations in English “Step by step, the library of UL - for you!”, in computer classes, the skills of using e-resources are acquired.

The following classes are provided for the students of the Bachelor's study programme: presentation “Step by step: Library for you”, lessons” Electronic Union catalogue and Primo for your successful studies “(90 min.),” Get to know e-resources “(90 min.),” E-resources in the field “(90 min.), E-course” Introduction to information literacy “ “(Part C course).

Students in master's study programmes and residency students are offered training in “E-resources in the field” (90 min.), providing in-depth skills for working with the electronic resources of the respective field.

The following training opportunities are provided for students in doctoral study programmes: “Introduction to the Scientific Publication Process” (90 min.), “Bibliography and Citation Management Tools” (90 min.), “Using the Web of Science and Scopus Databases in Studies and Research” (90 min.).

The following training opportunities are provided for academic and research staff: “Bibliography and citation management tools” (90 min.), “Using the Web of Science and Scopus databases in studies and research” (90 min.), “Entering publications and editing the list of publications in LUIS” (90 min.), “Research results depositing in the repository of e-resources of the University of Latvia” (90 min.).

UL Library staff also offers training for students at UL branches: In Aluksne, Bauska, Cesis, Jekabpils, Kuldiga, Madona and Tukums.

***Fee services***

The list of fee services and the price list of the University of Latvia Library have been approved by the Rector of the University of Latvia on August 10, 2021, by Order No. 1-4 / 387 on the pricing of fee services of the University of Latvia Library.

- Compilation of a list of information resources

The specialists of the UL Library prepare a reference list on the topic of interest to the user, for example, in the process of study or other work development. The user can order the list by filling in the electronic application form.

- Interlibrary Loan (hereinafter - IL) and International Interlibrary Loan (IIL) services

The UL Library offers its users to order information resources from other libraries in Latvia using the IL and worldwide using the IIL service. It is also possible to receive electronic copies of scientific articles in the form of printouts and by e-mail.

***Library collection, replenishment procedure***

The collection of the University of Latvia Library is created in accordance with the study fields and

scientific work of the University of Latvia, the requirements of study programmes, providing information at all levels of studies at the University of Latvia - bachelor's, master's, doctoral and scientific research areas. Purchasing e-resources is a priority in building a collection.

Purchase of new information resources in the collection (purchase of books, subscription to databases and periodicals) is carried out in accordance with the UL funding allocated centrally and approved annually by the order of the University of Latvia. The allocated funding is used to purchase the necessary books, pay for subscribed sectoral databases and subscribe to periodicals.

The library acquires information resources on the orders of the academic staff of the Faculty, on the proposal of the students' self-government or on the proposals of the Library staff, which are entered in LUIS and approved by the Dean of the Faculty or the Executive Director.

In 2021, Library users have access to 1.8 million items of information resources. According to the study and research infrastructure of the University, the collection of the University Library is located in 8 branch libraries and in the Repository.

***Literature available in the library for the implementation of the study field***

The information provision for the study field, including the library, periodicals and electronic resources, meets the current scientific knowledge and professional requirements for the successful implementation of studies and the development of scientific research. Thanks to the significant investment in the development of the library infrastructure, it has been possible to almost completely cover the study literature needs of bachelor's level students, and to secure almost 90% for the master's study courses . Bachelor's study courses are currently practically fully provided with study literature in English, Latvian and Russian, however, the number of copies of books for master's study courses is insufficient, as is the range of study literature in Latvian, as teaching aids are published episodically. However, this is partially offset by the placement of study course materials in the university's E-learning (Moodle) environment - almost all courses in bachelor's study programmes, and more than 80% of the courses in master's study programs in geography and geology have been significantly updated with e-course content in the reporting period.

See Table 7 for the number of study field-related sources available in the University Library and Table 8 for the number of study field-related sources available in the Natural Sciences Library.

*Table 7*

*Study fied-related sources available in the University Library*

| Printed publications in the UL Library, published from 01.01.2014 to 01.11.2021. | | | | | | |
|---|---|---|---|---|---|---|
| Number of printed publications (titles) | | | Distribution of publications by language (number of titles) | | | |
| Books | Series and periodical* issues | Other types of publications | Latvian | English | Russian | Other languages |
| 237 | 26 | 12 | 69 | 208 | 4 | 0 |
| In total: 275 titles | | | | | | |

*Piedzīvojums Dabā; Pārgājieni; Estonian Journal of Earth Sciences; Folia Geographica; GEO; Nature; Quaternary International* and other

*Table 8*

*Study field-related sources available in the Natural Sciences Library*

| Printed publications in the Natural Sciences Library, published from 01.01.2014 to 01.11.2021. | | | | | | |
|---|---|---|---|---|---|---|
| Number of printed publications (titles) | | | Distribution of publications by language (number of titles) | | | |
| Books | Series and periodical* issues | Other types of publications | Latvian | English | Russian | Other languages |
| 127 | 21 | 12 | 58 | 102 | 0 | 0 |
| In total: 160 titles | | | | | | |

*Piedzīvojums Dabā; Pārgājieni; Baltica; Estonian Journal of Earth Sciences; Folia Geographica; GEO; Nature* and other

***Level of digitization of the collection***

The UL Library in cooperation with the UL Information Technology Department provides free online access to the UL e-resource repository http://space.lu.lv. A mobile version of the repository is also available for user convenience. The UL Library, authors of publications, UL structural units or representatives of UL editions regularly place electronic versions of their publications, digitized information resources with cultural and historical value, doctoral dissertations of UL teaching staff and their synopses in the UL e-resources repository to ensure free and constant online access to UL scientific achievements.

Digitized publications, which are subject to copyright, are offered for use by the Library of the University of Latvia in on-site library reading rooms.

The e-resources repository currently contains more than 160 publications in the Geography and Earth sciences field of study.

***Electronic resources***

According to the UL strategic plan, the UL Library increases the share of e-resources and develops remote access to e-resources.

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

In total, in 2021, 42 e-resource platforms were available at the University of Latvia (both e-book platforms - *VLeBooks, ProQuest Ebook Central*, and e-journal databases - *Cambridge Journals Online* (archive available until 31.12.2018), *Emerald eJournals Premier* (archive available until 22.04.2020.), *JSTOR I-XII, XIV, XV and Life Sciences Collections, HeinOnline, Oxford Journals Online,*

*Sage Journals, ScienceDirect, SpringerLink Contemporary Journals, Taylor & Francis Social Science & Humanities Library, Physical Review Journals, Westlaw, Wiley Online Library E-Journals Full Collection* and separately purchased e-journals, and *Lursoft Newspaper Library NEWS.LV*, reference resources - *LETA online news*, *LETA Archive* and *Nozare.lv, Letonika*, tools - *SAGE Research Methods, Passport, Orbis, Overleaf Commons, MarketLine*, mixed-format databases - *ClinicalKey, Culturethèque, European Pharmacopoeia, LVS Latvian Standards Online Reading Room, OECD iLibrary, ProQuest Dissertations & Theses Global, ScienceDirect, Scopus, UpToDate, Web of Science Core Collection*). In total, 17 477 full-text e-journals (including individual subscriptions), about 205 306 e-books, almost five million full texts and abstracts of dissertations and master's theses worldwide are available. 174 verified open access databases with multi-format materials are available at the LU.

Every year, the UL Library offers an average of 110 new electronic resources.

Once a year, the University of Latvia Library evaluates and analyses the usability of subscribed databases. Likewise, the Library of the University of Latvia regularly provides trial access to various databases, on average about 15 accesses to trial e-resources are organized per year. The collected information on e-resources is available on the website of the University of Latvia Library e-resources from A to Z and e-resources by sectors, as well as in the section Databases of My Portal.

The UL offers an opportunity to use the subscribed electronic information resources (databases, e-book platforms) outside the UL computer network by logging in with the LUIS username and password.

***Subscribed e-resources in the study field "Geography and Earth Sciences":*** *GB3D Type Fossils; OpenGeoscience; The Encyclopedia of Earth.*

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***Subscribed multidisciplinary e-resources that include issues of the study field "Geography and Earth Sciences":*** *Cambridge Journals Online; EBSCO host; JSTOR; LETA Ziņas, Arhīvs un Nozare.lv; Nature; Oxford Journals Online; ProQuest Dissertations & Theses Global; ProQuest Ebook Academic Complete Collection; Science Direct; Scopus; SpringerLink Contemporary Journals; Wiley Online Library E-Journals Full Collection; Web of Science Core Collection.*

***E-books purchased by the University of Latvia Library in the study field "Geography and Earth Sciences":*** the eLook VLeBook and ProQuest eBook Academic Central platforms are available in the Library, which includes 52 eBooks for the study field "Geography and Earth Sciences".

***Open access resources***

Free access resources are available for the study field of Geography and Earth Sciences at the University of Latvia:

*Bookyards, Cambridge Dictionary, CORE, Directory of Open Access Books (DOAB), Directory of Open Access Journals (DOAJ), EBSCO Open Dissertations, Encyclopedia of Life (EOL), Europeana Collections, Eurostat Data, GB3D Type Fossils, Google Scholar, JSTOR Open Access Books, Latvijas Vēstnesis, OAPEN, Open Access Research Database (OARD), Open Geoscience, Periodika.lv, Science Books Online, SpringerOpen, The Encyclopedia of Earth, Wiley Open Science*.

The library collection generally secures the implementation of studies and the development of scientific research, as its stocks are supplemented every year with the most up-to-date information resources in accordance with the information needs of the 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.**

Modern information and communication technologies (ICT) provide great opportunities for the development of the educational process, allowing new projects to be implemented and new systems to be introduced to make the study process as successful as possible. The use of ICT in the educational process is one of the ways to increase learning motivation.

The IT Department of the University of Latvia provides students and staff with MS Office 365, a cloud-based application package. Office 365 provides students and staff with the best tools for modern study work, such as Outlook, Forms, OneNote, Sway, as well as the Office suite of applications, which includes Word, Excel and Powerpoint. In addition to MS Office 365, students and staff are provided with software such as SPSS, Question Pro, Autodesk, MathWorks MatLAB, Esri ArcGIS, etc.

For distance learning and distance education programmes, one of the Office 365 online applications, Microsoft Teams, is used, which provides online lecture delivery, lecture recording and online communication with students. In addition to the MS Teams programme, for remote studying, UL offers its students and staff the BigBlueButton information system (hereinafter - BBB system), an open source web-based online videoconferencing system. BBB provides a web-based event organisation solution for UL staff, including students and visitors to UL events, and can be used as an integrated solution both within the e-Learning system (only users registered for a course) and outside the e-Learning system, where you need to connect to the UL web conferencing server in your web browser at https://bbb.lu.lv.

Two e-learning environments are available at the University of Latvia, estudijas.lu.lv and edu.lu.lv. The e-learning environment estudijas.lu.lv is designed to support and manage the study process and the e-learning platform edu.lu.lv is designed for e-learning projects, events and courses, as well as distance learning programmes.

Both e-learning environments use the open source e-learning environment MOODLE, which is a modular object-oriented dynamic learning environment and is currently not only the most methodologically and pedagogically efficient, but also the most cost-effective e-learning solution. In the Moodle e-learning environment, practically all programmes of the study field "Geography and Earth Sciences" have created courses in which students have access to the necessary study materials and activities. Teaching staff can both assess students and record attendance.

For storing data during the study process, both students and staff, the University provides the Office 365 cloud service OneDrive 1TB. OneDrive is a Microsoft cloud service that connects to all of a user's files. It allows users to store and protect files, share them with other users and access them from any location on all their devices.

For data transfer, UL offers its students and staff the store.lu.lv bulk file transfer system. This system allows you to send files that cannot otherwise be sent by email due to their size, but is not

designed for long-term file storage.

Three laboratories with computers also provide access to internet resources: the Geographic Information Systems Laboratory, the Geospatial Analysis and Planning Laboratory and the Environmental Modelling Laboratory. In addition, by connecting their laptop to the UL wireless network, students can use all the information technology services available in the UL networks.

### 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.

There are three teaching groups at the UL: academic staff who hold their academic positions for a limited period of tenure on the basis of 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 recruitment and selection are regulated by the *Regulatory enactments on academic and administrative positions at the University of Latvia (available only in Latvian).* According to the regulations, the following academic positions exist at the University of Latvia: professor, associate professor, assistant professor, senior researcher, lecturer, researcher, assistant, research assistant. In 2021, a total of 52 academic staff members from the FGES (46 of them elected) were involved in the programmes of the study field, 81% of them with doctoral degrees, as well as 20 staff members from other structural units of UL (see Annex “Basic information on the teaching staff involved in the implementation of the study field”). The overall structure of the academic staff by position shows that 35% of all lecturers hold the academic title of associate professor or professor, the same number of assistant professors and senior researchers, while 30% of lecturers are researchers, assistants and hourly lecturers (39% of them with a PhD), indicating the growing role of highly qualified professionals and practitioners in the study process.

The procedures established and implemented by the University of Latvia are carefully followed at the Faculty of Geography and Earth Sciences. The decisions on the need for certain positions are made by the faculty. 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 University of Latvia's website https://www.lu.lv/ and in the Journal Latvijas Vēstnesis. Any person who conforms to the requirements specified by the Law on Higher Education, as well as the requirements for the position specified in the terms of reference may apply for the position.

The applicants for academic positions must deliver an open lecture, which is evaluated by two reviewers, usually associated professors and professors, who issue their opinion on the quality of the lecture. The election procedure is carried out by the Faculty Council (assistant, scientific assistant, researcher, leading researcher, lecturer and assistant professor), or in the case of associate professors and professors by the Council of Professors of Earth Sciences, Physical Geography and Environmental Sciences, Social and Economic Geography. Elections must take place within three months from the date of the call for applications. The personalities - docents, lecturers, assistants, senior researchers, researchers and research assistants - are voted on by secret ballot. Professors and associate professors are voted openly with ballot papers (UL Order No. 565 of 30.12.2020. “On the voting procedure in the Professors' Councils” Based on the amendments to Section 33 (2) of the Law on Higher Education adopted on 05.11.2020 (entered into force on

01.01.2021)). 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 official 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 Assistant Professor, the candidate has to 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 publish vacancies, a visiting academic may be recruited; while if the respective department considers a member of hourly-paid staff to be 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) (Procedures for the Recruitment of unelected teaching and research staff at the University of Latvia; see Annex "Recruitment of unelected"). 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 Rector of the University of Latvia concludes an employment agreement with the person elected for the entire term of office.

It follows from the above that the process of attracting and employing teaching staff is fully open, the qualifications of job applicants are evaluated several times and experts are attracted, decisions on elections are made by collegial institutions, which makes the process as transparent and secure as possible.

During the accreditation period, the composition of the teaching staff has been renewed, which was determined by the change of generations of lecturers, the need to improve and modernize the quality of study programmes, and the need to balance the workload of academic and research work. Since the previous accreditation, five people are no longer members of the academic staff, and since 2016, seven people have been elected for the first time. During the reporting period, several teaching staff have improved their qualifications and were elected to higher positions: E. Apsīte-Beriņa and J. Karušs were elected assistant professors, M. Bērziņš, R. Kasparinskis, M. Krievāns, K. Lamsters, S. Rūsiņa and A. Zariņa - as an associate professor, N. Stivriņš - as a professor. Thus, a better balance between academic work and research workload has been achieved during the reporting period. To enable the transfer of courses and the development of research and studies in the sub-branches of geosciences, doctoral students with the capacity and interest to perform academic work are involved in teaching the study courses. They are usually first invited to lead specific practical, laboratory and field work, as well as to carry out lectures appropriate to their specialization. Heads of departments and chairs, as well as programme directors, recommend prospective lecturers to participate in the election process for the positions of assistants, lecturers and assistant professors, which ensures their long-term involvement in the study process.

**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 Development Strategy of the University of Latvia for 2021-2027 emphasizes 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 professional development of the UL academic staff is organised in accordance with the Republic of Latvia Cabinet regulations No 569 of 11 09 2018, 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 of Ministers' Regulation No 129 of 25.02.2021 *"Procedure for the Evaluation of the Scientific and Pedagogical Qualifications or Artistic Creativity of a Professor or Associate Professor Candidate and of a Professor or Associate Professor in Office".*

The qualification requirements and tasks of the academic staff of the University of Latvia are included in the Regulations on Academic and Administrative Positions at the University of Latvia (available only in Latvian) while the quality/performance of the academic staff of the University of Latvia is evaluated in accordance with *the Regulations on Academic Remuneration at the University of Latvia (Decision No 14 of the University Senate of 30 May 2016)* and the *Regulations on Remuneration of Scientific Staff at the University of Latvia (Decision No 71 of the University Senate of 27 January 2020).*

University of Latvia Academic Remuneration Regulations

University of Latvia Scientific Personnel Remuneration Regulations (available only in Latvian)

The Academic Department of the University of Latvia and the Adult Education Centre of the Faculty of Education, Psychology and Art of the University of Latvia provide informative, consultative and methodological support to the UL academic staff in the field of the higher education didactics. The Adult Education Centre of the Faculty of Education, Psychology and Art of the University of Latvia 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. In turn, within the framework of the 2019-2021 SAPPP project No 8.2.2.0/18/A/010 "Academic Staff Renewal and Competence Development at the University of Latvia", the study field staff has been particularly active, participating in several programmes (see

below).

On the completion of the continuing education programme “Methodology for the formulation and evaluation of the learning outcomes”, programme directors and academic staff target the updating of their study courses and the mapping of the learning outcomes of the respective study programmes and study courses. During the reporting period in 2021, E. Lukševičs, the head of the study field, as well as E. Apsīte-Beriņa, the director of the Bachelor's study programme “Geography” (hereinafter BSP “Geography”) and the director of the Bachelor’s study programme “Geology” (hereinafter BSP “Geology”) M. Krievāns participated in the seminar on the methodology of formulation and evaluation of learning outcomes organized by the Academic Department.

The UL academic staff has the opportunity to advance their English-language skills by completing the continuing training programme “Enhancing Professional English Language Skills of University Academic Staff” at the Centre for Applied Linguistics of the UL Faculty of Humanities. During the reporting period, about a quarter of the lecturers of the study field from the FGES (E.Apsīte-Beriņa, M. Bērziņš, A. Dēliņa, L. Kalniņa, G. Kalvāne, R. Kasparinskis, Z. Krišjāne, E. Lukševičs, A. Markots, J Paiders, Z. Penēze, S. Rūsiņa, Ģ. Stinkulis, I. Strautnieks, I. Šteinberga, A. Zariņa) have participated in this programme; several of them, including the head of the study field, the director of BSP “Geography” and the director of the Master's study programme “Geology” (hereinafter MSP “Geology”) Ģ. Stinkulis obtained a certificate of English proficiency at C1 level.

Young academics and doctoral students from various UL doctoral programmes, each spring semester, are increasingly using the possibility to attend the continuing education programme “Introduction to teaching in higher education”. During the reporting period, practically all doctoral students in the field of study followed such a programme.

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.

The UL academic staff working 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”. Lecturers in continuing education programme especially appreciate the opportunity to model the study process, to try out new teaching methods, to share experience with each other.

With the funding of the European Union in the period from 2018 to 2022, several study programmes for lecturers are being implemented:

1. Development of online learning and digitization 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 - directors of study fields and study programmes).

During the reporting period, the academic staff of the study field quite actively participated in various professional development courses, improving their knowledge and skills, including computer literacy, online learning development and digitisation of teaching content, rhetoricand others. A major contribution to staff development in the area of leadership has been the 36-hour training course “Developing Academic Staff Competencies in Leadership”; the certificate has been awarded to E. Apsīte-Beriņa, M. Bērziņš, L. Dobkeviča, G. Kalvāne, J. Karušs, Z. Krišjāne, I. Kukuļs, J. Lapinskis, Z. Penēze, S. Rūsiņa, I. Šteinberga. In order to improve their digital skills, which are particularly useful during the period of distance learning, E. Apsīte-Beriņa, M. Bērziņš, L. Dobkeviča, G. Kalvāne, Z. Krišjāne, J. Lapinskis, E. Lukševičs, Z. Penēze, N. Stivriņš, J. Ventiņš attended the 36-

hour course “Digital Skills Development for Academic Staff”. In addition, E. Apsīte-Beriņa, L. Dobkeviča, I. Strautnieks and J. Ventiņš gained new knowledge about the use of the Moodle system. This course “E-environment Moodle. Practical recommendations in e-environment” has been developed and taught to other faculty members of the University of Latvia by one of the representatives of the FGES, assoc. prof. I. Šteinberga. The training course “Digital Media Literacy” (24 hours) was attended by lecturers E. Apsīte-Beriņa, I. Grīne, Z. Penēze, I. Šteinberga. The inprovement course “Public Speaking, the Art of Speaking and the Basics of Presentation for Cooperation with Industry and Audience” (16 hours) was completed by A. Dēliņa, L. Dobkeviča, G. Kalvāne, Z. Krišjāne, Z. Penēze, I. Silamiķele, and the 16-hour refresher course “Commercialisation Training” was attended by A. Briede, L. Dobkeviča, G. Kalvāne, J. Karušs, A. Markots and I. Silamiķele. M. Bērziņš attended the 32-hour refresher course “Scientific Activity and Publishing Skills”.

Thanks to the support of the UL project “Renewal of Academic Staff and Improvement of Competences at the University of Latviasa” assoc. prof. P. Šķinķis in 2018/2019 participated in an internship in the leading Latvian planning company SIA Metrum, while assoc. prof. A.Zariņa in 2019/2020in the SJSC Latvian State Forests.

All programmes have been developed by analysing the professional development needs of academic staff in the context of higher education trends.  As part of the deployment 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.

On the implementation of each programme, a survey and an evaluation of the outcomes is conducted among the attendees of the programme. Participation in continuing education programmes is voluntary or else might be a recommendation issued by the leadership of the faculty. It is typical that the UL faculties organise thematic seminars on topics relevant to the academic staff of the respective faculty.

The professional development activities of the academic staff of the University of Latvia were included in the Plan of measures for the development of the academic staff of the University of Latvia for 2018–2020 and are included in the plan of measures for the development of the academic staff of the University of Latvia for 2021–2023.

In order to determine the professional development needs of the academic staff of the University of Latvia in the field of the pedagogical activity, the Department of Studies of the University at the end of 2017 and the Programme for Development and Management Development of the University 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 competencies, 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” in order to effectively plan and ensure the enhancement of the competences of academic staff. The following outcomes are to be achieved by December 2023:

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

When planning the growth and development of the academic staff, the University of Latvia pays equal attention to the identification of the most capable students in the study programmes of the University of Latvia and to motivating them to get involved in academic work already during their studies (related to both teaching and research). In this context, the University of Latvia has developed requirements and selection criteria for attracting new doctoral students to the project operational programme "Growth and Employment" 8.2.2. 1st round "Renewal of Academic Staff and Improvement of Competences at the University of Latvia", 2nd round "Motivated, Modern and Competitive Academic Staff of the University of Latvia" Education, Pedagogy and Sports "and 3rd Round" Strengthening the Doctoral Capacity of the University of Latvia within the New Doctoral Model "(objective of specific support" To strengthen the academic staff of higher education institutions in the fields of strategic specialization "):

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 edition;
5. English language skills at least at C1 level;
6. successful passing of the doctoral exam 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 delivery.

Professor Vitalijs Zelčs has demonstrated an excellent example of ensuring the long-term development of his field of study and research (Quaternary geology and geomorphology). During accreditation period, he retired and stopped working at the University of Latvia. For many years, he has promoted the growth of several students in this field by supervising their theses c, as well as involving them in project implementation and course teaching. Largely due to his care and long-term vision, one associate professor (K. Lamsters) has been involved in teaching during the accreditation period, but two more members of teaching staff have undergone upskilling and having enhanced their academic qualifications were elected to the positions of associate professor (M. Krievāns) and professor (N. Stivriņš), respectively. Several new teachers are involved in the study process to train students to work with modern equipment and methods, as well as geographic information systems and process modelling solutions. This is necessary to bring study programmes even closer to the requirements of the labour market. An example of the above is the involvement of doctoral students and doctoral candidates J. Bikše, V. Zandersons and J. Ješkins in teaching the courses of the bachelor's and master's study programmes "Geology".

Targeting the growth and development of foreign academic staff, the University of Latvia 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 thereto;
3. Relevant scientific and academic work experience;
4. Ability to work in the e-learning environment;
5. Participation in at least three international conferences with a presentation/report;
6. Published monographs and scientific articles, including in indexed international editions;
7. Participation in or co-participation in research projects;
8. Excellent knowledge of foreign languages, especially English, skills to use them in studies and methodological work.

For successful and cohesive implementation of study programmes at the University of Latvia, a special study programme for heads of study fields and programmes directors was developed. It was delivered on October 12, 2021, the training was run by an international accreditation expert from Poland and representatives of the Latvian Higher Education Quality Agency. E. Lukševičs, the head of the study field, M. Krievāns, the director of the Bachelor's study programme “Geology” and E.Apsīte-Beriņa, the director of the Bachelor's study programme “Geography”, participated in this programme from the field of Geography and Earth Sciences.

In the course of elaboration of the self-assessment report of the study field, the information on the opportunities for promotion and qualification improvement used by the involved lecturers during the reporting period was collected, the results of which are summarised in the Table 9.

*Table 9. Promoting the growth of teaching staff*

***(assessment of didactic skills improvement and qualification improvement)***

| No | *Criteria / academic year* | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 1. | Improving language skills[2] | 0 | 0 | 0 | 3 | 6 | 5 |
| 2. | Higher education didactics (training)[3] | 7 | 0 | 5 | 5 | 15 | 15 |
| 3. | Attendance at various summer schools | 0 | 0 | 2 | 2 | 0 | 2 |
| 4. | Delivering lectures and study courses within the framework of Erasmus and Erasmus + programmes | 3 | 1 | 5 | 3 | 1 | 0 |
| 5. | Attendance at international scientific conferences (number of contributions) | 13 | 25 | 19 | 36 | 11 | 17 |
| 6. | Membership in professional organizations | 21 | 21 | 23 | 25 | 25 | 25 |
| 7. | Participation in various working groups (improvement of regulatory enactments, etc.) | 2 | 2 | 3 | 3 | 1 | 1 |
| 8. | Participation in various international scientific editorial boards | 11 | 11 | 11 | 12 | 14 | 14 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9. | Participation in various national scientific editorial boards | 2 | 2 | 7 | 2 | 2 | 2 |
| 10. | Participation in various international organizing committees | 1 | 5 | 2 | 3 | 1 | 1 |
| 11. | Participation in various national organizing committees | 8 | 9 | 9 | 7 | 7 | 7 |
| 12. | Other, including visiting researcher visits | 0 | 1 | 2 | 2 | 1 | 2 |

*More detailed information is reflected in the faculty CVs*

During the reporting period, the involvement of the faculty teaching staff in the language upskilling has sharply increased by participating in the continuing education programme "Enhancing Professional English Language Skills of University Academic Staff"; several lecturers obtained a certificate of English language proficiency at C1 level. The involvement in various upskilling courses and training has also tripled in the last two years. However, the participation in summer schools is not regular, which could be related to the specifics of the field of study to organize research and field work mainly in the summer season. The teaching staff of the study field participates in outgoing mobility, which undoubtedly provides added value for the implementation of the study process and the quality of studies. The incoming mobility of foreign academic staff is constantly high, which also contributes to the increase in the quality of studies. The number of lectures and study courses under the Erasmus and Erasmus + programmes is characterized by a steadily small number, which has naturally decreased sharply in the last two years. The participation in international scientific conferences shows a similar trend, showing an increase in 2019 and a sharp decline in 2020, with a tendency to recover in 2021 with a number of online conferences. The participation of academic staff in professional organizations is consistently high and tends to increase (see Section 2.4.3). Several lecturers of the study field from the FGES are members of the editorial board of various international scientific journals ("Baltica", "Tuexenia", etc.) or invited reviewers (E.Apsīte-Beriņa, A.Briede, M.Kļaviņš, L.Kalniņa, Z.Krišjāne, E.Lukševičs, N.Stivriņš).

[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, university 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.**

In the autumn semester of the academic year 2021/2022, 72 lecturers participated in the implementation of the study field – 46 lecturers elected to the FGES, 15 lecturers from other

faculties of the University (Faculties of Biology, Computer Science, Physics, Mathematics and Optometry, Humanities and Chemistry), 11 assistants and hourly lecturers, mainly professionals in geoinformatics and geomatics: in total 11 professors, 15 associate professors, 16 assistant professors, 5 senior researchers, 10 researchers, 4 lecturers, 3 assistants and 8 hourly lecturers, in compliance with Article 55 of the Law on Higher Education regarding the development, submission for approval, implementation and takeover of study programmes in case of their liquidation. This academic staff structure ensures the high quality of academic education, delivered mainly by highly qualified and internationally recognised experts in their field. Most professors have long academic and research experience: O. Nikodemus 43 years, Z. Krišjāne 32 years, M. Kļaviņš 31 year, A. Briede and E. Lukševičs – 26 years, V. Segliņš 24 years. The academic staff structure is, however, not optimal from the point of view of funding the programmes due to the low involvement of lecturers and assistants in the implementation of the programmes. During the reporting period, however, the structure has been improved by increasing the number of assistant professors, researchers and assistants. Compliance with the criteria of the Higher Education Council (HEC) for academic study programmes with fewer than 250 full-time students is assessed in the HEC decision (see the annexes “Opinion of the Higher Education Council”). 72.2% of all lecturers are elected at the University of Latvia.

The structure of academic staff is favourable and reflects integration with other study programmes of the FGES, primarily with Environmental Science programmes; the academic staff of the FGES provides the largest volume of studies, 64% (see Annex “Basic information on the teaching staff involved in the implementation of the study field”).

According to the data of the external audit of the functions and tasks of the scientific institutions to be reorganized at the University of Latvia, in comparison with other academic structural units, the age composition of the academic staff of the FGES has a good intergenerational structure and growth potential. Professional qualifications fully correspond to the implementation of the study programmes planned in the field of study; 78% of the academic staff have doctoral degrees; 56 lecturers have a doctor’s degree, the remaining 16 have a master's degree. Knowledge of the state language complies with the Cabinet of Ministers 7.07.2008. Regulation No. 733 “Regulations on the Amount of Knowledge of the State Language and the Procedure for Testing the Proficiency in the State Language for the Performance of Professional and Official Duties, Obtaining a Permanent Residence Permit and Obtaining the Status of a Permanent Resident of the European Union”.

All members of the academic staff speak English. For the third academic year in a row, the professional English language skills of the academic staff are being improved for work in the study environment and several lecturers (K. Āboliņa, E. Apsīte-Beriņa, I. Grīne, Z. Krišjāne, E. Lukševičs, G. Stinkulis, P. Šķiņķis, A. Zariņa and others) have supplemented their knowledge of English language at the level required for studies in English, participating in courses during the reporting period (for staff CV, see the annex “Biographies of the teaching staff members (Curriculum Vitae in Europass format)”, which are also available on the website of the faculty http://www.geo.lu).

During the reporting period, study courses (Cultural geography, BSP “Geography” and Contemporary Approaches to Studies of Places and Environment, MSP “Geography”) are taught in English, and several courses (Geology of Latvia, Field Course in Earth Sciences, Evolution of the Earth, Palaeontology and Stratigraphy, Paleogeographical Reconstructions, Urban Geography) certain lectures, seminars and field studies are taught in English if Erasmus + foreign students have registered for these courses.

During the reporting period, great attention was paid to balancing the academic, research and administrative workload of the staff of UL as a whole and of the staff of the FGES. The largest study load is for associate professors, who deliver 3-14 courses each, with an average of 7.9 courses for

17.3 cr.p. (it should be noted that one course is usually delivered by several faculty members). Assistant professors have only a slightly smaller study load, each providing 3-13 courses, with an average of 7.7 courses for 16.3 cr.p. The academic workload of professors is even smaller: while professors each deliver 9-19 courses, on average 8.4 courses, the volume of study work is slightly lower at 15.1 cr.p. The study load is even smaller for researchers and senior researchers, who mostly deliver a small number of courses – 1-14, on average 3.2 courses, with a total volume of 5.6 cr.p.; as well as for assistants, who each contribute to only one course, with a total volume of 2.3 cr.p. on average. In addition to study work providing lectures, a significant part of the academic workload is the supervision of coursework, bachelor's and master's theses, typically an average of 10-15 theses per year for assistant professors, associate professors and professors (mostly bachelor and master theses), and 2-3 theses (mostly coursework) for researchers and research assistants. In addition, professors supervise doctoral students and participate in the implementation of doctoral study programme in other field of study. Research workloads vary widely, depending on the position held and the research projects undertaken. In a typical situation, a professor's annual workload consists of academic work (50%), research (35%) and organisational work (15%).

The academic qualifications of both teaching and academic staff, and the diversity of professional competences and expertise in the field, contribute to the achievement of the expected learning outcomes. This is also supported by student, alumni and employer evaluations.

### 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 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 tutorials, counselling and workshops on study skills (notetaking, reading for academic purposes, active listening, exam anxiety, time management, libraries and Internet resources).

Academic support in academic matters is managed centrally by the UL Department of Study Services and the responsible persons with the respective faculties: director of the study programme, study advisor, trustee, mentor, academic staff, and the UL Students' Council and Faculty Students' Councils. In the first year of study, the support provided by the programme assistant and the trustee plays an important role; in the later years, the role of the programme director in providing advice or dealing with problems usually increases. At the FGES, in most cases of problems, student is sufficiently supported, with only the involvement of the programme assistant or the director of the study programme; cases where the dean's action is required are rarer, for example, when a student is deciding to take academic leave or to withdraw ftom studies altogether. Advice on the use of library and Internet resources is provided by the UL Library. The University of Latvia Library provides consultations on the use of the library and Internet resources. Table 10 displays examples of key tasks to be performed by student support units/staff.

*Table 10. Examples of key tasks to be performed by student support units/staff*

| Structural unit/staff | Key responsibilities |
|---|---|
| Faculty Student Council | Represents the interests of the students of the FGES, defends their rights by delegating representatives to the Faculty Council and the Study Field Council, which considers issues related to the study process. The Student Council organises cultural events and participates in the organisation of Faculty events. |
| Trustee | 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. |
| Coordinator, study advisor | Provides study advice, assists in day-to-day issues related to the study process, files study records, advises on the Information System of the University of Latvia (LUIS). |
| Mentor | A senior student who helps freshman students adapt to the study environment and share their experience. |
| Student Council (SC) | The purpose of the SC is to represent 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 University of Latvia, considering issues related to the study process and its improvement. |
| Director of the study programme | 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. |
| Study service department | 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 trustees, 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 as regards education and/or occupation, and ensuring that they can condition their future career, study and life paths. Career development support is provided by the Career Centre of the UL Study Services Department in collaboration with the respective faculties.

The Career Centre provides the following services to students:

- individual counselling 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://ekarjera.lu.lv/lv/login *(only in Latvian*), 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 Study Service Department. A psychologist-consultant 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.

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

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.

The Faculty's International Relations Coordinator is responsible for the success of the international exchange programmes (Erasmus, Erasmus +, etc.) and the mobility process, and is assisted by a person in charge of mobility in each of the three departments. One of the administrative assisstants is responsible for the successful operation of the faculty's website, all social accounts, the introduction of information on all public events, conferences, seminars, cultural events (for example, organizing a “Geologist Summer” storytelling event).

All students are provided with a minimum of two hours of consultation each week with each elected lecturer to give them an opportunity to discuss any unclear issues in person. Students can also receive a consultation at the study centre, re-register for study courses, receive explanations about study papers, apply for recognition of study courses, etc. The faculty provides students with copying services, while the library can scan books and other necessary materials. For independent and research work, students can use the reading room of the Natural Sciences Library, where they can read scientific journals, articles, printed and E-books, etc., computer rooms, individual study booths, as well as other rooms created for the needs of students.

## 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).**

One of the strategic goals of the University of Latvia is to become an internationally recognized science centre. According to the UL Strategy 2021-2027, it envisages the further development of the University as an internationally recognised science centre, the development of unique study and lifelong learning programmes, as well as offering competitive working and study conditions, an inclusive environment for students and staff motivated by the principles of academic integrity. The University is currently a national leader in science.

The GZZF carries out research in a wide range of Natural sciences, mainly Earth and related environmental sciences. The Geography Department conducts research in areas such as climate and water; implementation and development of integrated spatial and data analysis methods; aerobiology, phenology; Quaternary geology and geomorphology (glacial environment, sedimentation and landforms after the Ice Age, spatial changes in the Holocene environment); population, urban and settlement geography, regional, transport and tourism geography, population mobility, spatial systems. Research in bedrock geology (Palaeozoic and Mesozoic stratigraphy, palaeogeography of the Baltic Devonian basin, sedimentology and mineralogy, role of tidal processes in sedimentary basins); vertebrate palaeontology and palaeoecology; location, formation conditions and properties of mineral deposits; post-sedimentary changes in sedimentary rocks; in the field of applied geology – geophysical studies (GPR, electrical surveys, gravity and magnetic field studies, microseismics); modern glaciers; geoarchaeology, materials science; groundwater and its modelling; engineering geology are realised within the Department of Geology. Within the Department of Environmental Science, research in the fields related to the study field of Geography and Earth Sciences is carried out in the following areas: influence of environmental factors on soil diversity, spatial distribution and changes in soil properties; land use change and development of landscape ecological succession; improvement of landscape assessment and planning methodology; climate change management tools and their application in Latvia.

The professional qualifications of the staff involved in the implementation of scientific research are fully in line with the implementation of the study programmes planned in the field of study; most of the academic staff have a doctoral degree in geography or geology or a degree in related sciences (biology, physics, chemistry, pedagogy). According to the external audit of the functions and tasks of the UL scientific institutions that are to be reorganised[1], the staff of the FGES ensures sufficient scientific capacity to carry out scientific activities. The audit report states that the FGES is one of the two faculties of the University with a high proportion of scientists, which has been achieved by attracting active researchers, enabling successful scientific activities and large-scale scientific projects. During the reporting period, the academic staff carried out research activities mainly in major international and several Latvian Council of Science (LCS) funded projects, as well as was involved in applied research commissioned by state institutions and co-operative companies (see Annex “List of the publications, patents, and artistic creations of the teaching staff over the reporting period”). Due to the fact that the LCS has changed the project funding procedure, the number of Latvian state-funded research projects carried out by staff involved in the implementation of study programmes has significantly decreased during the reporting period, while the number of international projects has increased.

A total of 220 scientific articles have been published in internationally peer-reviewed publications included in the Web of Science or Scopus databases during the reporting period from 2016 to 2021 (see Annex “Summary of quantitative data on scientific and/ or applied research and / or artistic creation activities corresponding to the study field in the reporting period”). The analysis of the

performance of the research areas shows that research areas such as Quaternary Geology and Geomorphology, Environmental Chemistry and Ecotoxicology, Applied Geology, Landscape Geography, Bedrock Geology are of a high international standard, as a large number of publications (more than 30) are published in Q1 journals such as *Applied Geography* (1 paper), *Catena* (1), *Chemical Geology* (1), *Earth System Science Data* (2), *Environmental Science And Policy* (1), *Environmental Sciences Europe* (1), *Estuarine Coastal and Shelf Science* (2), *Forest Ecology and Management* (1), *Forest Ecosystems* (1), *Geobiology* (1), *Geoforum* (1), *Journal of Cleaner Production* (5), *Journal of Ethnic and Migration Studies* (2), *Journal of Hydrology* (2), *Nature* (1), *New Forests* (3), *Quaternary Science Reviews* (5), *Sedimentary Geology* (1); several publications have been printed in Q2 journals such as *Acta Palaeontologica Polonica* (1), *Aeolian Research* (1), *Environmental Earth Science* (1), *Holocene* (6), *International Journal of Biometeorology* (2), *Journal of Maps* (1), *Journal of Quaternary Science* (3), *Minerals* (1), *Palaeogeography, Palaeoclimatology, Palaeoecology* (1), *Review of Palaeobotany And Palynology* (2), *Sustainability* (2), *Water* (1), and others. Compared to the previous accreditation period, the number of publications in internationally peer-reviewed journals almost doubled from 119 in 2011-2016 to 220 in 2016-2021. This indicates the activation of research and the successful functioning of the mechanisms put in place by the FGES to promote the involvement of teaching staff in scientific research. During the reporting period, the academic staff of the field of study from the FGES has been very active, presenting at least 121 contributions related to the field of study at international conferences, symposia and congresses, as well as more than 200 talks at conferences in Latvia. Activity dropped significantly in 2020 due to pandemic situation but increased again in 2021.

[1] External audit of the functions and tasks of the scientific institutions of the University of Latvia to be reorganised. PricewaterhouseCoopers Ltd, 2015.

### 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.

Research activities of the academic staff of the FGES and the study field “Geography and Earth Sciences”, participation in the development of international and Latvian Council of Science funded projects directly and positively influence the study process. The research activities of the teaching staff are mostly closely related to the courses they teach. Research activities provide an opportunity to provide insight into the latest research directions, current scientific and practical solutions related to the study content in individual study courses, as well as general issues in the development of the field of Earth Sciences. The development of course content is also directly related to the research work of the lecturer. For example, the results of recent polar research are used in several BSP “Geography” and “Geology” courses, as well as in MSP “Geology” courses (“Quaternary Environment and Stratigraphy”, “Glacial Geology”, “Contemporary Geological Processes”, etc.). Similarly, the latest research findings are used in other courses in connection with research in human geography, biogeography, climatology, palaeogeography, palaeontology, regional geology, hydrogeology and other aspects of applied geology and geography.

Students are involved in various research projects, working on bachelor's and master's theses. Master's thesis supervisors (academic staff) often guide students' research work in relation to the themes of their own research projects; where possible, lecturers also involve students in research

projects (prof. A. Briede, E. Lukševičs, Z. Krišjāne, O. Nikodemus, N. Stivriņš, assoc.prof. M. Bērziņš, R. Kasparinskis, M. Krievāns, Ģ. Stinkulis, P. Šķiņķis, A. Zariņa, and others).

Evaluating the use of research results in the study process, it should be noted that the findings of scientific research and current information obtained at international conferences are regularly reflected in lecture materials and discussed with students in seminars and practical classes. It allows to improve the content of the study courses and provides better communication with students, helps to achieve a deeper understanding of theoretical knowledge, promotes the acquisition of research methods and the skills to apply them.

Scientific research also forms a permanent part of the study process: both within the framework of separate study courses (reports, essays) and in study papers and final theses, in which students investigate a specific topical issue. Students choose their own research topic, using the knowledge and skills they have acquired during their studies. The work is presented and defended within the study course or (final thesis) in front of a board.

**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.**

International cooperation in scientific research at the Faculty is manifested in various ways: as participation of academic staff in international projects, participation in international scientific conferences, participation in their organisation, chairing conference sections. Active cooperation with foreign partners is also reflected in the publication of internationally significant research results with foreign researchers. In addition, several lecturers are involved in internationally recognised, indexed journals (as editorial board members, reviewers) and are members of international and regional research organisations/associations. International cooperation has a direct and significant impact on all study programmes in the field of study, including the PBSP “Geoinformatics”.

During the reporting period, 13-18 international research projects were conducted each year, including in cooperation with partners from Estonia, Russia, Lithuania, Poland, Finland, Germany, Sweden, etc., and 13-17 national projects. During the reporting period, the faculty's staff managed or participated in the implementation of international (45) or local (47) projects of importance for the field (at least 92 projects in total), including the following international projects:

- EU HORIZON 2020 Joint Research Programme project EJP SOIL Nr. 862695 “Towards climate-smart sustainable management of agricultural soils” (2020-2024);

- EU HORIZON 2020 project eLTER “Long-term infrastructure for ecosystem and socio-ecological research” (2015-2019);

- ES HORIZON 2020 project eLTER PLUS “European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS” (2020.-2025.);

- ES HORIZON 2020 1.1. project “Tracking our ancestors across the Devonian world: a new multidisciplinary approach to the origin of tetrapods” (2021.-2026.);

- ES HORIZON 2020 project YMOBILITY: “Youth Mobility: maximising opportunities for individuals,

labor markets and regions in Europe" (2015.-2018.);

- ES LIFE+ Programme project "Integrated planning tool to ensure viability of grasslands (LIFE Viva Grass)" (2014.-2019.);

- EU LIFE+ Programme project "Coastal habitat conservation in Seaside Nature Park" (Cohabit) (2017-2019);

- EU LIFE programme project LIFE19 IPE/LV/000010, LIFE-IP LatViaNature "Optimisation of management and management of Natura 2000 protected areas" (2021-2017);

- ESPON Programme project "The role and future perspectives of Cohesion Policy in the planning of Metropolitan Areas and Cities (ESPON METRO)" (2020.-2021.);

- LIFE15 CCM / DE 000138 project "Rehabilitation of degraded peatlands to reduce CO2 emissions in the northern European lowlands" (2018.);

- Est-Lat Interreg project "Joint management of groundwater dependent ecosystems in transboundary Gauja-Koiva river basin (GroundEco)" (2018.).

Major local projects:

- National Research Programme (NRP) project "Energy Efficient and Low Carbon Solutions for Secure, Sustainable and Climate Resilient Energy Supply (LATENERGI)" (2014-2018);

- Sub-programme "Exploration of mineral resources for diversification of natural raw materials and development of new technologies (GEO)" of the NRP "Exploration, sustainable use of forest and mineral resources - new products and technologies (ResProd)" (2014-2018);

- NRP "Economic Transformation, Smart Growth, Governance and Legal Framework for Sustainable Development of State and Society - New Approaches for Building a Sustainable Knowledge Society" (EKOSOC_EN) Project 5.2.4 "Societal renewal by reducing the risks of depopulation, promoting population regeneration and links with the diaspora" (2014-2017);

- NRP "Latvian Heritage and Future Challenges for National Sustainability" project "Towards sustainable development and inclusive society in Latvia: response to demographic and migration challenges" (DemoMig) (2018-2021).

Eight projects funded by the Latvian Council of Science were implemented (or started) during the reporting period.

As already noted above, the academic staff of the FGES has been very active during the reporting period, presenting 121 contributions related to the field at more than 80 international conferences, symposia and congresses in almost all EU countries (most notably Germany, Italy, Austria and Spain), as well as in Canada, Russia, China, Serbia, Switzerland, Ukraine and Vietnam. Among the most important are: IALE 2017 European Landscape Ecology Congress "From Model and Process to People and Action", Ghent, Belgium; IV World Congress of Latvian Scientists, 2018, Riga, Latvia; 5$^{th}$ International Palaeontological Congress, 2018, Paris, France; 3$^{rd}$ International Stratigraphic Congress STRATI 2019, Milan, Italy; LIFE Restore International Conference "Sustainable Management of Degraded Peatlands and Climate Change Mitigation", 2019, Riga, Latvia; 20$^{th}$ Congress of the International Union for Quaternary Research (INQUA), 2020, Dublin, Ireland; 7$^{th}$ European Congress of Aerobiology, 2020, Cordoba, Spain; European Soil Congress "EuroSoil2021", Geneva, Switzerland; General Assembly of the European Geosciences Union (EGU), Vienna, Austria (2017-2019) and remotely (2020-2021). Each year, 14-15 sessions in Latvian and English are organised within the framework of the International Conference of the University of Latvia, focusing on current research issues in geography, geology and environmental science. The conference is

attended by the academic staff of the faculty, as well as Latvian and foreign researchers, mostly from the Baltic States, as well as master's and doctoral students of the University of Latvia.

The academic staff is actively involved in the activities of internationally recognized journals as members of the editorial board and reviewers: prof. Z. Krišjāne ("Journal of Baltic Studies"), prof. E. Lukševičs ("Earth and Environmental Science Transactions of The Royal Society of Edinburgh", "Geodiversitas", "Journal of Vertebrate Paleontology", "Palaeontologica Electronica"), prof. N. Stivriņš (Acta Palaeobotanica, African Journal of Microbiology Research, Boreal Environment Research, Bulletin of the Geological Society of Finland, Estuary, Coastal and Shelf Science, Forests, Palaeogeography, Palaeoclimatology, Palaeoecology, Sustain-nability, The Holocene, Water), assoc.prof. K. Lamsters ("Baltica"), assoc.prof. S.Rūsiņa ("Tuexenia").

During the reporting period, active cooperation with foreign universities and institutes continued in conducting joint research, implementing joint projects, preparing publications and organising conferences, as well as organising guest lectures (Bergen University, Institute of Geology of Komi Scientific Centre of Russian Academy of Sciences, Palaeontological Institute of Russian Academy of Sciences, State Institution National Antarctic Scientific Centre of Ukraine, St.Petersburg State University, Swiss Federal Institute for Forest, Snow and Landscape Research, Tallinn University of Technology, University of Oviedo, University of Tartu, University of Turku, Uppsala University, Vilnius University etc.).

The academic staff of the FGES are active members of several international organisations, such as the Baltic Stratigraphic Association (BSA) (E.Lukševičs), European Aerobiological Society (EAS) (L.Kalniņa, O.Sozinova), European Landscape Ecology Association (IALE-Europe) (O.Nikodemus), European Soil Conservation Society (ESCS) (R.Kasparinskis), European Association for Population Studies (EAPS) (Z.Krišjāne), Regional Studies Association (RSA) (J.Krūmiņš, Z.Krišjāne), International Union of Soil Science (IUSS) (R.Kasparinskis), International Union of Geodesy and Geophysics (IUGG) International Association of Cryospheric Sciences (IACS) (K. Lamsters), International Geographical Union (IGU) Commission "Global Change and Population Mobility" (Globility) (M.Bērziņš), International Union of Geological Sciences (IUGS), Sub-Commission on the Devonian Stratigraphy (SDS) (E.Lukševičs), International Commission on the History of Geological Sciences (INHIGEO) of the International Union of Geological Sciences (IUGS) (E.Lukševičs), International Quaternary Research Association (INQUA) (L.Kalniņa, K.Lamsters), International Peat Society (IPS) (L. Kalniņa), International Association of Sedimentologists (IAS) (Ģ.Stinkulis), International Association of Vegetation Science (IAVS) (S.Rūsiņa), Nordic Society of Hydrology (A.Briede), and active members of local associations.

The successful development of the field of study is inconceivable without active and productive international cooperation in the future. Development issues within the framework of the FGES and the field of studies are regularly discussed at the meetings of the faculty management and departments; the development plan for the field of study foresees the participation in no less than 15 different, mostly international, research projects each year. Research cooperation with traditional partners in Estonia, Lithuania, Norway, Finland, Ukraine, Sweden and other countries will be continued and strengthened.

**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.**

The Faculty of Geography and Earth Sciences promotes the involvement of academic staff in scientific research by providing the necessary support in the areas of legal, administrative, organisational and information resources. Thus, in accordance with the UL Academic Staff Development Plan for 2018-2020, the scientific work on the priority topics set by the University of Latvia was materially supported at the faculty. At the university level, a professional development system for academic staff and a programme to support scientific excellence and commercialisation have been developed and implemented, thus providing material support for publication in the Q1 or Q2 category in the Web of Science database.

The academic staff of the Faculty successfully carries out scientific and applied research in both fields of geography and Earth sciences approved in Latvia: 1) Earth Sciences, Physical Geography and Environmental Science; 2) Social and Economic Geography. During the reporting period, successful projects were carried out in the sub-fields of geography: nature geography, regional and environmental geography, applied geography and geomatics, population geography and population migration studies, as well as in the sub-fields of geology: quaternary geology and geomorphology, applied geology and bedrock geology. This has enabled the development of studies based on science and practice.

The involvement of teaching staff in research is strengthened by encouraging them to engage in thematically diverse international research projects and to produce publications of an appropriate level. The teaching staff of the field have participated in the implementation of more than 50 different international scientific projects (EU Horizon 2020, EU 7$^{th}$ Framework Programme projects, Latvian-German Higher Education Office (DAAD) programme, Interreg Central Baltic, BONUS project BaltCoast, ERDF, EU LIFE, Nord Plus projects, etc.). In addition, research opportunities are expanded by funds from national, Latvian Council of Science (LCS) and individual organisation support funds for the implementation of research projects and the publication of their results. The LCS support has been received for climate change and its impact assessment (A.Briede), geophysical data integration and soil pollution mapping (J.Karušs), ecosystem resource assessment and management solutions (O.Nikodemus), climate change and tidal influence on Devonian organisms (E.Lukševičs), dust moss reference network in Latvia (N.Stivriņš), etc, as well as participation in the implementation of several projects of the National Research Programme (A.Briede, R.Kasparinskis, Z.Krišjāne, V.Segliņš, Ģ.Stinkulis).

Applied research projects have been funded by Riga municipality (Z.Krišjāne, P.Šķiņķis, J.Paiders) and other municipalities (Grobiņa, Rauna: M.Krievāns; Mazsalaca: Ģ.Stinkulis), the Ministry of Regional Development (A.Briede), the Nature Conservation Agency (L. Kalniņa, M.Krievāns, A.Markots, S.Rūsiņa), Latvian Environmental Protection Fund (L.Kalniņa, R.Kasparinskis), State Inspectorate for Cultural Monuments Protection (A.Markots), Association “Sēlijas kultūras projekti” (A.Markots), etc. Faculty students, lecturers and researchers have access to modern research infrastructure and scientific publication databases (Scopus, Web of Science, EBSCO). The Faculty provides material support for the participation of lecturers in international conferences and the publication of research results at international level.

**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.**

Students' involvement in scientific and/or applied research is consistently stimulated throughout their studies, starting at the Bachelor's level. During their bachelor's studies, students prepare their first independent scientific work - a study paper summarising data on a chosen topic and presenting the material they have collected. All study programmes include a final thesis (bachelor's thesis, master's thesis), which is a compulsory final examination and a prerequisite for the award of an academic degree. A final thesis is, by its very nature, a scientific research, methodological or applied synthesis of the results of a study with a solution to a topical theoretical or practical problem in one of the sub-disciplines of Geography and Earth Sciences. Thus, within the study field, a mechanism has been developed and is successfully functioning, which promotes the involvement of students of all levels in scientific research.

Bachelor's and Master's thesis supervisors – members of the academic staff of the FGES – often supervise students' research work in relation to the topics of their own research work, and, where possible, lecturers also involve students in research projects (A. Dēliņa, L. Kalniņa, J. Karušs, R. Kasparinskis, Z. Krišjāne, K. Lamsters, E. Lukševičs, O. Nikodemus, Ģ. Stinkulis, N. Stivriņš, A. Zariņa, etc.). One of the successful examples is the project "Tidal regime and climate influence on the Middle-Late Devonian biota in the epicontinental Baltic palaeobasin" funded by the LCS and implemented in 2018-2021 (leader Prof. E. Lukševičs), which involved some bachelor and several master level students. The results obtained during the project implementation were used for the development of two bachelor's theses (P. Ķeružis, T. Reķe) and five master's theses (V. Alksnītis, G. Lagzdiņa, S. Mačute, M. Meire-Kārkle, L. Vernera).

Significant efforts to involve students in research have been made through the National Research Programme (NRP) "Latvian Heritage and Future Challenges for National Sustainability" project "Towards sustainable development and inclusive society in Latvia: response to demographic and migration challenges" (DemoMig), which has enabled students to conduct research, report at national scientific events and develop final theses at bachelor, master and doctoral study levels.

During the reporting period, several scientific articles co-uthored by students have been published (e.g. Šteinberga, Stivriņs 2021; Stinkulis, Lukševičs, Reķe 2020, etc.).

Students have an opportunity to participate free of charge in the UL conference, which organises 14-15 sessions each year at the Faculty. Each year, most Master's students actively participate in the work of the sections with oral or poster presentations; Bachelor's students present less frequently. The students of the field, mainly Master's and PhD students, actively participate in conferences of young scientists, organised occasionally by various foreign universities (Cracow, Tartu, etc.), as well as by the European Association of Geology Students. In the future, doctoral students will study in a doctoral level study programme of another field of study, but they will be actively involved in research related to the implementation of the field of study "Geography and Earth Sciences" in accordance with the research directions defined by the FGES.

**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.**

**Organisational innovation**

In 2021, a new core unit of the FGES – the Centre for Polar Research – is established. The Centre's researchers have organised scientific expeditions to the polar regions of Antarctica, Greenland, Iceland and Svalbard in 2018-2021. The establishment of the Centre for Polar Research has led to the funding of several projects and several scientific publications, including in the Journal of Maps and Antarctic Science. Knowledge transfer has been achieved by improving the study process through the development of a new interdisciplinary course “Polar Geography”, as well as by complementing existing study courses such as “Quaternary Geology”, “Geomorphology”. Another innovative solution for the study process stems from the need to provide insight and learn field research methods in the field without the presence of a faculty member, due to the pandemic situation. Innovations have been introduced in the BSP Geology and BSP Geography courses such as the “Field Course in Earth Sciences”, “Field Methods in Geosciences” and the “Field Course in the Regional Geology”. The teaching staff responsible for the implementation of the course developed geological excursion routes, created topographic maps with GPS points for observation, descriptions of the tasks to be carried out by the students, as well as made video recordings with comments on observation sites, geological processes or phenomena, which were uploaded to *Youtube*. All these materials were uploaded as pdf and/or Word.doc documents and links to relevant Youtube documents among the course materials in the Moodle environment. During the study period, students took these routes, made the necessary observations, measurements, took photos, which were summarised in field study reports and uploaded to Moodle.

## 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 faculty members of the study programmes in Geography and Earth Sciences actively participate in various cooperation networks in the academic environment, as well as at the state and local government level. As mentioned above, there are no other universities in Latvia that implement similar fields of study and study programmes, only some programmes of other fields of study of some universities include some study courses in geography or geology. However, the academic staff of the study programmes implemented by the FGES of the University of Latvia actively cooperate with the academic staff of Riga Technical University (RTU), Daugavpils University (DU), Latvia University of Life Sciences and Technologies (LULST)), mainly in research, organising conferences, as well as participating in the exchange of academic staff. One example is the regular guest lectures on geomorphology by DU lecturers. Within the study field, the FGES has a long-standing successful cooperation with other study fields of natural sciences and engineering study programmes at other Latvian higher education institutions: RTU, LULST and DU. The cooperation is also manifested in the following ways:

- Professors of the FGES and professors of other universities are members of the council of

professors and promotion councils;

- The faculty members and doctoral students of the FGES participate in joint research and applied projects, scientific conferences and seminars together with lecturers from other universities;

- Professors and associate professors of the FGES provide advice to students of different levels at other universities.

On the other hand, joint study programmes with partner universities in Latvia or abroad are not implemented in the study field.

The active cooperation with the Ministry of Regional Development of Latvia (MRDL), JSC Latvian State Forests, Latvian Land Service, Latvian Centre for Environment, Geology and Meteorology, Latvian Geospatial Information Agency (LGIA), Latvian National Museum of Nature, local governments and other institutions is quite remarkable. Agreements have been concluded with some institutions on the provision of applied studies for students, on cooperation in research, exchange of information, etc. The participation of academic staff in defining priority areas for science and innovation is important, as it allows them to anticipate the potential job market.

During the reporting period, close cooperation with the Latvian Centre for Environment, Geology and Meteorology (LCEGM) has continued: materials of the Geology Foundation have been used in the development of several bachelor's and master's theses; while the teaching staff of the University of Latvia has provided advice to the LCEGM on various issues related to natural geography and geology. The cooperation with potential employers (LCEGM, LGIA, MRDL, Metrum Ltd, etc.) also takes place in the implementation of applied study courses in Bachelor's and Master's study programmes. In the context of continual cooperation with the Latvian National Museum of Natural History, joint activities have been organised, including excursions and practical work in various courses such as “Introduction to Geological Studies”, “Palaeontology and Stratigraphy”, “Telmatology”, Evolution of the Earth”, while academic staff have provided advice to colleagues from the Natural History Museum. Regular contacts are maintained with a number of private companies carrying out geological works (VentEko Ltd, Geolite Ltd, Unicone Ltd, Vides konsultāciju birojs Ltd, State Company Conexus Baltic Grid and others), opportunities are offered to introduce students to geological exploration works. Many of the young professionals in these organisations are graduates of the BSP and MSP Geology programmes at the University, who continue to maintain contact with the University. Both these contacts and the cooperation with the management of these organisations make it possible to anticipate the development of the potential labour market and its needs.

During the reporting period, BSP and MSP Geology students have continued to collaborate with mining and building materials companies on research projects of their theses. In the study courses “Geology of Mineral Deposits”, “Dynamic Systems of Earth” and “Sedimentary environment and processes” practical work is carried out in dolomite, gypsum, clay and quartz sand mining sites – Kalnciems, Kranciems, Salaspils, Liepa and Bale quarries. Students and their supervisors establish and maintain contacts with many Latvian mining companies in the course of the development of their final theses, in order to carry out geological studies of various kinds in dolomite, sand and gravel, limestone, clay, quartz sand, peat and other quarries. These companies include Lode Ltd, Knauf Ltd, Schwenk Latvija Ltd, Saulkalne S Ltd, Gneiss Ltd, DSG Karjeri Ltd, etc.

Cooperation with employers also takes place through participation in the activities of professional associations (Latvian Geographical Society, Latvian Geologists' Union, LatQUA, Latvian Stratigraphic Commission, Latvian Association of Cartographers and Geodesists, etc.).

Participation in the annual scientific conferences of the University of Latvia and opportunities to publish research results in the conference proceedings of the UL are important mechanisms for

attracting employers and ensuring regular contacts. During the reporting period, the involvement of employers in the study process has intensified, for example, by providing the BSP “Geology” course “Engineering Geology” topics on geological exploration using truck-based or other heavy drilling equipment, including self-propelled units, as well as by involving employer representatives in conducting individual lectures or seminars.

Due to the fact that in 2021 the first students were admitted to PBSP “Geoinformatics”, the programme of which envisages an internship in the amount of 20 CP, a system for the provision of internship places and organization of the internship is being developed in the study field. Internship opportunities are provided in leading companies and institutions in the field of geoinformatics through agreements between the University and internship providers. Students will be provided with internships by “Karšu izdevniecība Jāņa seta” Ltd, State Company Latvijas Valsts meži, MikroKods Ltd, (in all cases these partners agree to provide internships also for students from abroad) with which the agreements have been concluded, as well as students will be free to choose internships in a company of their interest related to geoinformatics. The specific tasks of the internship are detailed in the course descriptions; the organisation of the internship is discussed in the introductory lecture provided by the internship supervisor. Internships in companies will provide an opportunity to strengthen the acquired theoretical knowledge and promote more successful integration of students into the labour market.

Cooperation with municipalities is mainly in the framework of applied research, implementing projects commissioned and financed by individual municipalities (Grobiņa, Mazsalaca, Rauna, Riga, etc.). For example, under the leadership of assoc.prof. A.Zariņa, with the participation of PhD students (M.Vološina, K.Krumberga, D.Immurs), the thematic planning of the landscape structure of Babīte municipality has been developed. In cooperation with Ventspils Municipality, a study on the landscapes and their values of Ventspils Municipality has been carried out, including recommendations for further development and planning (A.Zariņa, I.Vinogradovs 2020). In Zemgale planning region, a thematic plan of landscapes and green infrastructure on a regional scale (2019) has been developed, including guidelines for local landscape planning.

**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.**

Cooperation with various foreign institutions within the field of study is in line with the objectives of the development of the field of study, the implementation of study programmes relevant to the field of study and related research. The FGES participates in Erasmus+ and DAAD exchange programmes, as well as implements cooperation projects within the framework of bilateral agreements. Students of the study field are offered opportunities to take part in various exchange programmes and to study abroad for a semester or a year. Students can also undertake internships (full or partial) in study programmes of other foreign universities, and both students and academic staff can undertake exchange trips under bilateral cooperation agreements. The FGES actively participates in the projects announced by State Education Development Agency (SEDA) and

acquires other international projects, such as the EEA/Norwegian Financial Instrument. International cooperation partners (universities and institutions) are selected on the basis of mutual interest, similar study and activity profile, quality of knowledge and experience in the geosciences, and experience in implementing joint projects. In the academic year 2021/2022, the GZZF signed 53 Erasmus+ cooperation agreements with universities in 21 EU and EEA countries. In 2019, as part of the TWINNING project, Z. Krišjāne and M. Kļaviņš participated in the development of higher education standards in Azerbaijan, including the development of a new standard for the Bachelor's study programme “Geography”.

A large share of academic staff are members of, or Latvian representatives to, foreign and international professional organisations (International Commission on the History of Geological Sciences INHIGEO, The International Union for Quaternary Science INQUA, International Geographical Union, International Union of Geological Sciences IUGS, Society of Nordic Hydrology, Subcommission on the Devonian Stratigraphy IUGS SDS and other), thus ensuring collaboration with academics, often resulting in joint projects and publications. According to the specifics of the study field, the FGES has cooperation agreements with the Catholic University of Leuven, Tallinn University of Technology, Bamberg, Klaipeda, St.Petersburg, Tartu, Tübingen, Turku University, Kaliningrad Kant University, Institute of Geology of the Komi Science Centre of the Russian Federation. Exchanges of guest lecturers and students are taking place with these universities, especially in the Eastern Baltic region, and have become particularly active in recent years. Joint research is carried out, the results of which have been presented in international publications, and international projects. The Faculty has particularly close cooperation with the Universities of Bamberg, Bergen, Klaipėda, St Petersburg, Tallinn, Tartu, Turku, Uppsala and Warsaw. Continuing training for academic staff is also largely based on the opportunities offered by international cooperation. This takes place with various universities and research institutes in Western countries (Lund, Stockholm, Tartu, Turku, Uppsala, several German universities, etc.).

**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.**

In the academic years 2019-2021, Dr T. Lang (Germany) and G. Sechi (Italy) were recruited to work full-time in the project No 8.2.2.0/18/A/010 “Renewal and Competence Development of Academic Staff at the University of Latvia”. In addition, several foreign guest lecturers made short-term visits to give lectures to students at different levels and programmes under cooperation agreements. Starting with the academic year 2016/2017, the Faculty hosted lecturers and researchers from 13 countries and 19 universities and institutes (see Annex “Statistical data on the teaching staff and the students from abroad”). Among them were researcher K. Schmidt (Germany); Dr. M. Sofijev (Finland); Prof. Z. Tursunova (USA); A. Burkov (Russia, Republic of Maryel); Dr. T. Lang (Germany); Dr. D. McCollum (UK); A. Montanari (Italy); L. Spruženiece (UK, formerly at the UL); Dr. P. Beznosov (Russia); prof. K. Sundblad (Finland, Russia); Dr. P. Likberg (Sweden) and others.

Specific measures to attract foreign students to the faculty are carried out at a minimum, as the University has a separate department dealing with student recruitment. The main and most widely used mechanism for attracting international students is cooperation with recruitment agencies abroad. The FGES produces information materials and maintains an English-language Faculty

website with information on study opportunities, the application procedure and all issues of interest to international students. Incoming student mobility has been consistently high during the reporting period, with a tendency to decrease slightly in the academic year 2020/2021 (see the Annex "Statistical data on the incoming and outgoing mobility of students").

the students of the study field "Geography and Earth Sciences" of the UL have the opportunity to study both individual courses and several semesters at European universities. During the reporting period, the types of mobility have expanded, thus enabling students to participate in the Erasmus + mobility programme, which allows them not only to study, but also to do internships in foreign institutions. Students could use the internship opportunities within the framework of the EEA / Norway Financial Instruments Programme "Research and Scholarships". The mobility of MSP "Geography" students through a study placement in Germany was supported by the German Academic Exchange Service (DAAD). The students had an opportunity to participate in the Nordplus programme project, which gave students from the Baltic and Nordic countries the opportunity to study individual courses jointly implemented by lecturers from several universities. The cooperation agreement with the University of Turku was very important for the training and research of the BSP and MSP "Geology" students, as a result of which it was possible to implement a field study course in Finland until 2019. However, in contrast to the number of incoming students, the number of outgoing students decreased over the reporting period and outgoing student mobility remained stable at a relatively low level over the reporting period, especially in 2020 and 2021. This can be explained both by a decrease in the overall number of students and a lack of motivation to go on exchange studies, as most students at all levels of study are already working and report that their jobs and salaries are important to them. In order to motivate students to participate in exchange programmes, the faculty organizes lectures and experience exchange stories.

Outgoing mobility of staff involved in the implementation of study programmes has slightly increased in the reporting period compared to the previous accreditation period. The opportunities of the Erasmus+ lecturer mobility programme were used, prof. Z. Krišjāne lectured practically every year at different universities, prof. E. Lukševičs gave lectures at the University of Oviedo (Spain), the Natural History Museum in Stockholm (Sweden), assist. prof. E. Apsīte-Beriņa lectured at the University of St Andrews in Scotland and the Slovak Academy of Sciences, assoc. prof. A. Zariņa lectured at the University of Bergen (Norway) and Tallinn University, and visited Switzerland, where she worked at the Federal Institute of Forest, Snow and Landscape, etc. Z. Krišjāne conducted research on migration processes at the University of Bamberg (Germany) as an Alexander von Humboldt Foundation Fellow.

Mobility activities among the staff of the FGES during the reporting period are excellent. In the framework of the Operational Programme's "Postdoctoral Research Support" projects, young scientists have increased the visibility of their research interests in Europe through international mobility activities. For example, assoc. prof. K. Lamsters, assoc. prof. M. Krievāns and assist. prof. J. Karušs have participated in three major mobilities to the polar regions, in 2018 two weeks in Iceland and 68 days in Antarctica, in 2019 15 days in Svalbard. The research in Antarctica was carried out together with scientists from the National Antarctic Research Center of Ukraine, which operates the Vernadsk polar station. The research has been presented in several joint publications, including the Journal of Maps and Antarctic Science. The research in Svalbard was carried out together with scientists from the Polar Station of Nicolaus Copernicus University (Poland), which resulted in a joint publication in the Journal of Glaciology. In general, scientific co-operation was carried out during the expeditions, joint research, new glacier research methods were mastered, such as in-situ ablation measurements, temperature measurement in wells, drilling in ice with hot steam.  During the reporting period in 2018, assist. prof. E. Apsīte-Beriņa stayed in Bratislava, Slovakia with the financial support of post-doctoral project No. 1.1.1.2/VIAA/1/16/184. The main

purpose of the mobility was to meet colleagues (Dr. Vladimir Balaz and Dr. Martina Chrancokova) from the Institute of Forecast of the Slovak Academy of Sciences. During the stay in Bratislava, a seminar on general trends in migration and youth mobility to / from Latvia was held and important knowledge on the use of the experimental method in migration research was gained. In addition, during a mobility at St. Andrews University in Scotland in November 2018, the project's research methodology was refined and further collaborations with several international scientific publications were discussed.

## 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.

An implementation plan was developed to implement the recommendations of the Expert Group of the previous 2017 accreditation procedure for the improvement of the Geography and Earth Sciences field of study and programmes. After receiving the previous report of the 2017 international accreditation experts, the Dean of the Faculty, based on the decision of the Management Meeting, ordered the creation of an implementation plan for the recommendations made by the experts. The plan was approved in 2017 and most of the recommendations were accepted and implemented, thus the plan was successfully implemented (see Annex “Report on the implementation of the recommendations received in the previous accreditation and licensing and/ or change assessment procedures and/ or the procedures for the inclusion of the study programme in the accreditation form of the study field”), improving the quality of studies and contributing to process improvement.

The expert statement “increase internationalization by ensuring a wider use of English in the teaching of study courses” helped to promote a wider use of English in the teaching of MSP “Geology” and “Geography” study courses. To increase the internationalisation of studies, MSP “Geography” has introduced two courses delivered in English, while MSP “Geology” has provided Erasmus+ exchange students with the opportunity to study in English in several courses. In 2019-2021, a large part of the teaching staff took part in English language development courses taught by lecturers from the Faculty of Humanities of the University of Latvia, thus improving their language proficiency and obtaining the respective certificate. In order to increase transparency on mobility opportunities and improve the dissemination of information among students and academic staff at the Faculty, a new section on mobility opportunities was created on the FGES website in December 2017 and is regularly updated each year. In order to intensify the involvement of employers in the use of expensive equipment at their disposal in geology/geography studies and research, new cooperation agreements have been renewed and concluded, under which the quality of certain study courses has been improved, for example, the BSP “Geology” study course “Engineering Geology” now offers access to heavy drilling equipment, including heavy vehicles and self-propelled vehicles, which are not available at the University of Latvia. In response to the recommendation to intensify communication on the motivational and potential resources and

opportunities of research and mobility programmes, both the FGES website and regular consultations at departmental and chairs meetings were introduction to discuss these questions. As a result, the involvement of academic staff in research projects and the number of publications have increased. In order to further develop the system of listening to students' opinions, which in some cases was considered by experts as too bureaucratic and even dysfunctional, since 2017 regular informal meetings are organised every semester between the Student Council and the Faculty management, including the dean, directors of the field of study and study programme, where various issues related to the improvement of the study process and the study environment are discussed. To continue to focus on social aspects and to make better use of alumni who occupy important and prominent positions in society, meetings with alumni are held at special events such as the Alumni Reunion (every five years) and on dates of importance to the Faculty or the University, and regularly during University conferences.

In the previous accreditation, experts also pointed out that there are just a few instances of sources published for students in Latvian , but to some extent this is compensated by the inclusion of course materials in the e-learning (Moodle) environment. This recommendation is in line with the need to teach students and improve scientific terminology, as well as with the mission of the University to ensure the development of the Latvian language. The above arguments were one of the justifications for the development and publication of the monograph “Latvia. Land, Nature, Nation, State” 2018. Nikodemus, O., Kļaviņš, M., Krišjāne, Z., Zelčs, V. (eds.). Riga: Academic Publishing House of the University of Latvia, 752 pp.

**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).**

During the accreditation period, a new professional bachelor’s study programme “Geoinformatics” was licensed (4.08.2021). Annex 19 "Overview of implementation of recommendations" summarises the implementation of recommendations made by experts during licensing. The recommendations are mainly related to issues of study organisation. Short-term recommendations are already being implemented, while long-term recommendations will be implemented gradually in the period until the next accreditation.

# 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 | List of the main internal normative acts and regulations of the University of Latvia Appendix 1.docx | Saraksts ar galvenajiem LU iekšējiem normatīvajiem aktiem un regulējumiem 1. pielikums.docx |
| The management structure of the higher education institution/ college | LU Governance Structure Appendix 2.docx | LU Pārvaldības struktūra 2. pielikums.docx |
| II - Description of the Study Field - 2.1. Management of the Study Field | | |
| Plan for the development of the study field (if applicable) | The goals of the study field and their compliance with the development directions and strategic goals of the UL Appendix 3.docx | Studiju virziena attīstības plāns 3.pielikums.docx |
| The management structure of the study field | Study field management structure Appendix 4.docx | Studiju virziena pārvaldības struktūra 4.pielikums. docx.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. | A copy of a document certifying that the higher education institution will provide students with opportunities to continue their education in another study programme Appendix 5.docx | APLIECINĀJUMI_5_pielikums.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. | A copy of a document certifying that the higher education institution guarantees compensation for losses to students Appendix 6.docx | Rektora APLIECINĀJUMS 6 pielikums.edoc |
| Standard sample of study agreement | Standart sample of study agreement Appendix 7.docx | Studiju līguma tipveida paraugs 7 pielikums.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 | Analysis of the results of surveys of students, graduates and employers Appendix 8.docx | Studējošo, absolventu un darba devēju aptauju rezultātu analīze 8.pielikums.docx |
| 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 | Basic information about the teaching staff involved in the implementa-tion of the study field Appendix 9.docx.xlsx | Akad personala saraksts akredit2021.xlsx 9.pielikums.xlsx |
| Biographies of the teaching staff members (Curriculum Vitae in Europass format) | Biographies (Curriculum Vitae) of the teaching staff Appendix 10 CV.pdf | LV-GZZF_2022_SV akad personala CV 10.pielikums.pdf |
| 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. | Declaration State Language Appendix 11.pdf | Virziena vad apliecin par valsts valod Pielikums 11.pdf |
| 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) | Certification on the knowledge of foreign languages Appendix 12.docx | Apliecinājums par svešvalodu prasmi 12. pielikums. docx.docx |
| 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. | Summary of quantitative data on scientific and applied research activities relevant to the study field during the report period Appendix13.docx | Kvantitatīvo datu apkopojums par studiju virzienam atbilstošām zinātniskās un lietiškās pētnieciības aktivitātēm pārskata periodā 13.pielikums.docx |
| List of the publications, patents, and artistic creations of the teaching staff over the reporting period. | List of publications of teaching staff for the report period Appendix 14.pdf | Mācībspēku publikāciju, patentu, mākslinieciskās jaunrades darbu saraksts 14.pielikums.pdf |
| II - Description of the Study Field - 2.5. Cooperation and Internationalisation | | |
| List of cooperation agreements, including the agreements for providing internship | List of cooperation agreements Appendix 15.docx | Sadarbības līgumu saraksts (profesionālās bakalaura studiju programmas "Ģeoinformātika" ietvaros) 15.pielikums.docx |
| Statistical data on the teaching staff and the students from abroad | Statistics on international students and teaching staff Appendix 16.docx | Statistikas dati par ārvalstu studējošajiem un mācībspēkiem 16.pielikums.docx |
| Statistical data on the incoming and outgoing mobility of students (by specifying the study programmes) | Statistics on outgoing and incoming student mobility Appendix 17.docx | Statistikas dati par studējošo izejošo un ienākošo mobilitāti 17.pielikums(7).docx |
| Statistical data on the incoming and outgoing mobility of the teaching staff | Statistics on incoming and outgoing mobility of teaching staff Appendix 18.docx | Statistikas dati par mācībspēku ienākošo un izejošo mobilitāti 18.pielikums(4).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. | Overview of the implementation of recommendations Appendix 19.docx | Iepriekšējās novērtēšanas procedūrās saņemto rekomendāciju ieviešana 19.pielikums.docx |
| An application for the evaluation of the study field signed with a secure electronic signature | Application.docx | Iesnigums Studiju virziena "Ģeogrāfijas un Zemes zinātnes" novērtēšanai.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 | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.docx | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.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) | | Augstākās izglītības padomes atzinums atbilstoši Augstskolu likuma 55. panta otrajai daļai 29.pielikums.docx |
| 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 | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.docx | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.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 | Compliance of the Bachelor's study programme Geology with the State Education Standard Appendix 38.pdf | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.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) | | 51 pielikums.docx |
| 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) | Plan of the Bachelor's study programme Geology Appendix 40.docx | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.docx |
| Descriptions of the study courses/ modules | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.docx | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.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) | | |

# Other annexes

| Name of document | Document |
|---|---|
| Kārtība par nevēlētu mācībspēku pieņemšanu | 1-197kons_kartiba par neveletu .doc |
| Recruitment of unelected | 1-197_-2012_Kartiba_par_neveleto_macibspeku_un_zinatnieku_pienemsanu_darba___tulkots_EN.doc |

# Geography (43442)

| | |
|---|---|
| Study field | *Geography and Earth Sciences* |
| ProcedureStudyProgram.Name | *Geography* |
| Education classification code | *43442* |
| Type of the study programme | *Academic bachelor study programme* |
| Name of the study programme director | *Elīna* |
| Surname of the study programme director | *Apsīte-Beriņa* |
| E-mail of the study programme director | *elina.apsite-berina@lu.lv* |
| Title of the study programme director | *Dr geogr* |
| Phone of the study programme director | *+37128613939* |
| Goal of the study programme | *Goal of the study programme is to provide students with high-quality acquisition of theoretical knowledge and research skills in the field of geography, theoretical and practical training corresponding to the needs of the labour market, which provides an opportunity to successfully participate in solving economic problems.* |
| Tasks of the study programme | *Objectives of the study programme is to achieve this goal, the study programme has the following objectives:*<br>*1) to provide a study process that ensures the acquisition of basic and specialised knowledge of geography and its subdisciplines (natural geography, regional and environmental geography, applied geography and geomatics and human geography) and opportunities to demonstrate critical understanding of this knowledge;*<br>*2) to provide the opportunity to learn modern geography methods and basic knowledge of the technologies used;*<br>*3) to develop work skills that ensure graduates' competitiveness in the labour market;*<br>*4) to promote the acquisition of skills that are essential in today's labour market;*<br>*5) to learn the basics of innovative activity and develop critical thinking skills;*<br>*6) develop research skills in a sub-discipline or area of geography.* |

| | |
|---|---|
| Results of the study programme | *KNOWLEDGE*<br>*1. Demonstrates basic knowledge in geography, understanding of the most important concepts and regularities of geography, as well as specialized knowledge in one of the subsectors, critical understanding of this knowledge.*<br>*2. Have an idea of the regularities of geographical processes and current trends in the development of geography.*<br>*SKILLS*<br>*3. Perform research activities in geography and one of its sub-sectors, select the necessary information, formulate and analytically describe the problems, explain and argue about the problems in the field of geography both with specialists and with the general public.*<br>*4. Use modern technologies and methods in geography (geographical information systems and remote sensing materials, data analysis methods).*<br>*5. Independently structure learning, direct further learning and professional development, take responsibility and initiative, working individually and working in a team or leading the work of other people.*<br>*COMPETENCE*<br>*6. Use knowledge of the composition and functioning of the components of the geographical coverage in different situations, the latest findings and methods in identifying and solving geographical problems.*<br>*7. Independently obtain, select and analyse information and use it, make decisions and solve problems in areas related to geography.*<br>*8. Evaluate the impact of natural processes and economic activities on the environment and society and participate in solving geographical problems.*<br>*9. Develop research in the chosen field of geography, promoting the development of the field of geography.* |
| Final examination upon the completion of the study programme | *Bachelor 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 of Natural Sciences in Geography* |
| 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 - 3 years - english**

| | |
|---|---|
| Study type and form | *Full time studies* |
| Duration in full years | *3* |
| Duration in month | *0* |
| Language | *english* |
| 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 of Natural Sciences in Geography* |
| 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 |

**Part time extramural studies - 4 years - latvian**

| | |
|---|---|
| Study type and form | *Part time extramural studies* |
| Duration in full years | *4* |
| 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 of Natural Sciences in Geography* |
| 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 |

**Part time extramural studies - 4 years - english**

| | |
|---|---|
| Study type and form | *Part time extramural studies* |
| Duration in full years | *4* |
| Duration in month | *0* |
| Language | *english* |
| 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 of Natural Sciences in Geography* |
| 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.**

The most significant change that has taken place in the implementation of the study programme since the previous accreditation report was the replacement of the study programme director. At the beginning of 2020, the previous programme director, Dr.geol., assist.prof. A. Markots was replaced by Dr.geogr, assist.prof. Elīna Apsīte-Beriņa. The change of programme directors was successful and positive. The purposeful communication and feedback with the students allowed the new study programme director to get an idea of the desired changes in the organisation of the study process and changes in the study plan.

Compared to the previous accreditation period, the aim and objectives of the study programme, admission requirements, and other parameters have not changed, learning outcomes have been reassessed and updated, and full-time partial studies are no longer offered.

The study program results were consolidated when evaluating the study results in cooperation with employers.

**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 is in line with the field of study "Geography and Earth Sciences". Upon graduation from the academic bachelor's study programme "Geography", graduates obtain a bachelor's degree of natural sciences in geography, which corresponds to an internationally recognised field of science and is relevant to the field of study. The goal, objectives and learning outcomes of the study programme are also in line with the Bachelor's level studies in geography, as they enable the acquisition of knowledge, skills and competences in geography and directly correspond to the field of study and the title of the study programme. The first two digits of the programme code (43442) indicate the level of study – academic education (Bachelor's degree), while the third to fifth digits (442) correspond to the field of study – Geography and Earth Sciences. The programme code is therefore correctly designed and matches the other programme parameters.

The goalof the study programme is to provide students with high-quality acquisition of theoretical knowledge and research skills in the field of geography, theoretical and practical training corresponding to the needs of the labour market, which provides an opportunity to successfully participate in solving economic problems. This will enable the preparation of qualified specialists with the theoretical knowledge, research skills and abilities in the field of geography, theoretical and practical training appropriate to the needs of the country, in order to successfully engage in and contribute to the solution of economic problems, independently making decisions and creative solutions to everyday tasks in changing and uncertain conditions.

The objectives of the study programme are formulated in accordance with the set goal and are intended to ensure that the included study courses and their teaching methodology develop students' critical and creative thinking, promote their efforts to independently expand their knowledge and strengthen their practical skills, which are necessary for every highly-qualified specialist working in the subfields of geography (natural geography, regional and environmental geography, applied geography and geomatics, and human geography). The wording of the aim indicates a direct link to the title of the programme, the objectives are derived from the stated aim.

The duration, scope and content of a study programme, as well as the achievement of its goal and objectives, are determined by a number of factors:

- The programme provides the comprehensive foundational knowledge of geography needed to further develop students and to give graduates a broader perspective on the diversity of the field of geography. This is ensured by core courses in science and geography such as Earth Science, Earth Remote Sensing, Geographic Information Systems, Foundation of Environmental Science, Earth Physics, Chemistry for Environmental and Earth Sciences, Cartography, etc, human geography courses (Human Geography, Introduction to Regional Geography, etc.) and natural geography courses (Biogeography, Hydrology, Climatology and Basics of Meteorology, Geomorphology, Soil Science, Landscape Geography).

- The programme trains specialists in geography and its sub-disciplines, thus the field courses at the Lode Manor Station and the expeditions that take place at the end of the spring semester of the 1$^{st}$ and 2$^{nd}$ year (Field Methods in Earth Science, Field Methods in Earth Sciences II) are an integral part of the study programme.

- For knowledge and skills in the public, private and international sectors, the offer is complemented by the development of foreign language skills (English I), in addition to the option of studying a foreign language in one of the free elective courses.

- Students develop qualitative theoretical knowledge and research skills through independent research in geography, developing a bachelor's thesis project and, in the end, a bachelor's thesis, which is an original research in one of the sub-disciplines of geography.

- The programme has a maximum enrolment of 50 students each year and offers a student-tailored approach to the study process. Students have an opportunity to actively participate and be assessed in each seminar or practical class by submitting a seminar or practical paper. Feedback is also encouraged through regular individual communication and in face-to-face lectures and via estudijas.lu.lv.

The content of the study programme is designed to achieve the set aim in accordance with the set tasks and is appropriate for the Bachelor's degree in natural sciences to be obtained in accordance with the State Academic Education Standard (Cabinet of Ministers Regulation of 13 May 2014 No 240 “Regulations on the State Academic Education Standard”). The admission requirements of the study programme take into account mathematics and English language skills, which help students to better achieve their learning outcomes and to acquire knowledge, skills and competences related

to the field of geography and research.

In general, it can be concluded that the content of the study courses of the programme, the degree to be obtained, the aims and objectives of the programme, as well as the conditions of admission are fully mutually compatible. By fulfilling the objectives of the programme, students have achieved the aim of the programme, resulting in a Bachelor of natural science degree in Geography, which allows students to fully participate in the labour market and to continue their studies in a Master's degree programme.

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

The bachelor's study programme “Geography” offered by the University of Latvia is the only programme for the training of bachelor’s level geography specialists in Latvia. Potential workplaces in Latvia have been identified and are as follows: territorial and environmental management institutions (Ministry of Regional Development and Local Government, Ministry of Environment and Regional Development (MoERD), State Regional Development Agency, Latvian Centre for Environment, Geology and Meteorology (LCEGM), regional and national environmental authorities, consulting firms, research institutes, as well as non-governmental organisations. It is important to note that the programme trains specialists in a growing body of research in the field of geography and its sub-disciplines, which is supported by core and performance funding, funding from the LCS, other research grants provided by Latvia and the European Union, as well as contract work. State and local authorities attract students specialising in meteorology, cartography and remote sensing, regional development analysis and management, spatial planning, etc. (MoERD, LCEGM, Latvian Geospatial Information Agency (LGIA), regional environmental administrations, regional development agencies, etc.). Private companies are interested in attracting the best students to work in the fields of geographical information systems and cartography, spatial planning, environmental assessment, landscape planning, nature and heritage conservation.

**Employers' assessment** of the qualifications of graduates (Tables 12 and 13) is high, graduates are considered to have good theoretical and practical training, graduates' capacity to acquire new knowledge and skills and their ability to work independently are appreciated.

*Table 12.*

*Employers' feedback on cooperation and recommendations*

| ***Name*** | ***Type of cooperation/ recommendations*** |
|---|---|
| Jāņa Sēta | Research collaboration - joint research projects in line with the company's R&D strategic orientations. |

| | |
|---|---|
| Latvian Geoinformatics Information Agency | Collaboration could involve more actively recruiting recent graduates to work for the Agency and collaborating in research.<br>The young people mostly have a good theoretical and practical knowledge base and good computer skills, can work independently after a short period of training, but some training continues for a long time. They are sociable and eager to learn, but few of them can come up with new ideas and solutions.<br>More attention should be paid to the exact sciences – cartography, remote sensing, geodesy, geomatics, programming, mathematics, GIS, etc. |
| Envirotech | In general, as a company whose field of activity is closely related to the University of Latvia and especially the Faculty of Geography and Earth Sciences, we try to communicate and inform faculty members about the latest trends and developments in the field, invite them to events and are open to various models of cooperation. |
| Central Statistical Bureau | A Cooperation Agreement has been signed between the University of Latvia and the Central Statistical Bureau. |
| Latvijas Valsts Meži (*State Forests of Latvia*) | Continue to conduct joint research, provide internships, provide guest lecturers, participate and co-organize conferences. |
| Ministry of Environmental Protection and Regional Development | Post information on university – student communication platforms about job vacancies. However, this would only be relevant for Master's students, as the majority of public administration employees are civil servants, for whom a university degree is a mandatory requirement. |
| Valsts zemes dienests (*State Land Service*) | On the positive side, there are applied studies during the course, which allow for more practical skills.<br>Encourage the recruitment of final year students to the State Land Service. |

*Table 13.*

*Employers' assessment of graduates' preparedness for the labour market*

| Please rate the skills of graduates (FGES UL) who have completed their education in the last 3 years on a scale of 5! (*0- don't know, can't estimate, 1-very bad, 2-bad, 3-mediocre, 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 and justify decisions | | | | | X | |
| 8 | Ability to propose new ideas and solutions | | | | | | X |
| 9 | Ability to adapt to new circumstances (changing work environment) | | | | | | X |
| 10 | Ability to work independently, defining work methods and deadlines | | | | | | X |
| 11 | Latvian language skills | | | | | | X |
| 12 | Foreign language skills | | | | | | X |
| 13 | Computer skills | | | | | | X |
| 14 | Communication skills (oral communication, business correspondence, report preparation, presentation, etc.) | | | | | | X |
| 15 | Teamworking skills | | | | | | X |
| 16 | Ability to plan, manage and organise the work of others | | | | | X | |
| 17 | Responsible attitude to work | | | | | | X |
| 18 | Competitiveness compared to graduates from similar programmes at other universities | X | | | | | |

Alumni surveys are carried out periodically. The alumni survey of the BSP “Geography” was conducted in October 2021 (Tables 14 and 15). An anonymous survey of undergraduate alumni was released on the QuestionPro survey platform. Graduates of the programme from 2016 to 2021 were invited to participate in the survey. A total of 63 alumni responses were collected.

The analysis of the survey results shows that the highest number of respondents came from 2021 and 2016 graduates, with 24% and 20% of the total number of respondents respectively. Reflecting the gender distribution of students, male respondents are also more represented. Geographically, the largest representation of respondents is from Riga and the closest neighbourhood of Riga. Almost 70% of the respondents have been employed for at least 3 months in a field related to their study programme. The analysis of the reasons for not starting work in the field identified a number

of reasons. The most common reasons (7 people) for choosing another job were competitive salaries or a desire to pursue a career in another sector. However, there are also a number of respondents who are continuing their studies at tertiary level and have not yet entered the labour market.

According to the survey results, the majority of respondents, or 60%, are in full-time employment at the time of the survey, while around a third of respondents are still studying in addition to their job. In terms of workplace, at least half of the respondents are employed in public institutions, 35% in the private sector and there is a small representation in municipal institutions. Almost 60% of respondents say that their daily work is directly related to their specialisation.

*Table 14.*

*Results of the BSP "Geography" Graduates Survey 2021 on students' satisfaction with the quality of their studies*

| ***Question:*** Please rate the quality of studies in the BSP "Geography" *: | ***Result*** | ***Deviation*** |
|---|---|---|
| **Choice of study programme** | **2.1** | 1.2 |
| **Overall quality of the study programme** | **2.2** | 0.8 |
| **Education contributed to labour market integration** | **2.3** | 1.0 |
| **Opportunity to contribute to improving the quality of the study programme** | **2.3** | 1.0 |
| The impact of the study process on the personality to enter the labour market | 2.4 | 0.9 |
| Recommending the study programme to others (relatives, friends, others) | 2.4 | 1.1 |
| Relevance of the content of the study programme to the latest developments | 2.5 | 0.9 |
| Relevance and application of acquired knowledge in the workplace | 2.5 | 1.1 |
| Relevance of the acquired knowledge, skills and competences to the requirements of today's labour market | 2.6 | 1.1 |

* Response options:

1 - strongly agree, 2 - rather agree, 3 - neutral, 4 - rather disagree, 5 - strongly disagree. A lower rating indicates a higher rating.

Graduate surveys show that the Bachelor's degree programme is highly rated. The most highly rated aspects of the study quality assessment are: improved critical thinking skills (ability to

evaluate, analyse, systematise information) and appreciation of the choice of study programme.

*Table 15*

*Results of the 2021 BSP "Geography" graduate survey on knowledge and skills acquired during studies*

| ***Question:*** Please rate the following aspects of the study programme *: | ***Result*** | ***Deviation*** |
|---|---|---|
| Improved critical thinking skills (ability to evaluate, analyse, systematise information) | 1.6 | 0.6 |
| Improved teamwork skills | 1.7 | 0.6 |
| Theoretical knowledge acquired in the chosen field of study | 1.8 | 0.5 |
| Improved ability to make decisions based on prior analysis of information | 1.8 | 0.5 |
| Acquired ability to work with industry-specific computer software | 1.8 | 0.6 |
| Research skills acquired | 1.9 | 0.5 |
| Acquired ability to apply theoretical knowledge of your field in practice | 2.0 | 0.6 |
| Improved ability to creatively solve problems of varying complexity | 2.0 | 0.6 |
| Acquired ability to analyse large amounts of information | 2.0 | 0.7 |
| Acquired skills in the use of modern information technologies | 2.0 | 0.8 |

* Response options:

1 - very satisfied, 2 - rather satisfied, 3 - rather dissatisfied, 4 - very dissatisfied. A lower number indicates a higher rating for a particular aspect.

### 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 in the study program "Geography", all students studied full-time in Latvian, except for exchange students, where part of the lectures, practicals, laboratory, fieldwork and individual consultations were held in English. The data show that the number of matriculated students has slightly decreased in the last six years, and the number of graduates has also decreased similarly. There are several reasons for the decrease in the number of matriculated students. In 2016, 67 students matriculated in the 1st year and 2021, 49 students. All students

have been admitted and studied full-time studies in person.

Statistical data on the number of students enrolled in the Bachelor's study programme “Geography” throughout the reporting period show that the number of students is stable, but unfortunately with a slight downward trend over the years. Although the decrease is slight, the decline in the number of students is due to the wide range of study programmes offered in Latvia and abroad. The general demographic trends are also significant, determining the overall decrease in the number of students in Latvia. In the academic year 2021/2022, 109 students study at the BSP “Geography”. Statistical data on the number of students enrolled in BSP “Geography” is available in the Annex.

Promotional activities have been carried out in schools, on the internet and in the media to increase the overall number of students.

In the reporting period, students' incoming and outgoing mobility in the field generally shows a constant intensity. However, the most intensive mobility period in the programme is in 2018. In the most recent reporting years (2019 - 2021), mobility has decreased slightly. This can be explained by 1) the reluctance of students to terminate their employment abroad; 2) the impact of COVID-19 on travel and travel restrictions in Europe, which reduced students' willingness to go abroad.

Traditionally, BSP “Geography” students have made good use of mobility trips offered by the ERASMUS+ programme and have successfully integrated into further studies after a period spent abroad. Unfortunately, despite an initially high number of applications for ERASMUS+ for the academic year 2021 to study abroad, the global pandemic COVID-19 affected the intensity of student mobility, and a significant number of students did not use their mobility.

Applications for ERASMUS+ mobility at the UL FGES are centralised. Students are regularly informed about this opportunity, and the benefits are explained. When applying, students must fill in an application form, prepare for an interview in English and justify their choice of university. Students go abroad on a priority basis, considering their average grades and level of study.

During the reporting period, BSP “Geography” students went to different universities. Universities in Germany, the Czech Republic, Slovenia and the Netherlands were the most frequently selected, but also Lithuania, Portugal, Finland, Sweden and Hungary.

**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.**

Since 2009/2010, the study programme has fully complied with the Lisbon Convention (1997), the Bologna Declaration (1999) and other international documents regulating higher education. The duration of studies is three years (6 semesters). At the end of the studies, a bachelor's thesis is prepared, original research in one of the subfields of geography.

The content of the Bachelor's study programme “Geography” is developed following the Cabinet of Ministers Regulation of 13 May 2014 No 240 “Regulations on the State Standard of Academic Education”, current scientific trends, industry and labour market needs. The courses offered in the Bachelor's degree programme are designed considering recommendations from industry experts, employers, graduates and students. Their content is in line with the level of the Bachelor's degree programme. Additionally, it considers labour market practices affecting geography-related sectors in public institutions and the private sector.

The study courses' aims, objectives and planned learning outcomes are designed to enable students to progressively develop and deepen their knowledge of the natural sciences and Earth sciences: starting with the core course at the University of Latvia and the geography course and continuing with the restricted choice courses. Each student thus acquires the necessary knowledge and practical skills in the fundamentals of natural sciences and geography and chooses courses within the specialisation in an area of geography.

The aims, objectives and learning outcomes of the study courses assume that the graduates of the programme are able to independently collect, analyse, use and communicate geographical information and select and practically research methods in geography.  Thus, the aims, objectives and learning outcomes of the study courses correspond to the goal of the study programme "to provide students with high-quality acquisition of theoretical knowledge and research skills in the field of geography, theoretical and practical training corresponding to the needs of the labour market, which provides an opportunity to successfully participate in solving economic problems", objectives and learning outcomes.

The mandatory part A of the BSP “Geography” consists of a Bachelor's thesis of 10 CP and a Bachelor's thesis project of 2 CP in the sub-area. Thesis development is included in all years of study. The basics of geographic research and the choice of a topic of interest are started in the course “Introduction to Geography Studies” and continued in the course “Geography of Latvia”, during which a course work on a topic of interest has to be developed.

The mandatory part A courses for the degree in natural sciences at the UL comprise 10 CP. The core courses are included in semesters 1 and 2 of the first year of study. Students study a foreign language consecutively: “English I” (or “German”), “Chemistry in Environmental and Earth Sciences”, “Civil Protection”, “Environment Protection”, and “Earth Physics”.

The subject-specific subjects in the first year include “Earth Sciences”, “Human Geography”, and “Foundations of Environmental Science” in the first semester. In the second semester, students take “Cartography”, “Climatology and Basics of Meteorology”, and “Soil science”. Finally, students consolidate the knowledge acquired in theoretical classes in the field in the course “Field Methods in Earth Sciences”.

The BSP “Geography” study plan is well balanced, offering mandatory and elective courses during

the second and third years of study. For example, Part A in the second year includes the courses “Introduction to Regional Geography”, “Geographic Information Systems”, and “Geography of Latvia” in the third semester and “Landscape Geography”, “Hydrology”, and “Geomorphology” in the fourth semester. The field course “Field Methods in Earth Sciences II” also reinforces the knowledge acquired in the theoretical classes at the end of the second year.

Two new courses have been added to Part B of the second year to provide students with a thematically diverse choice of courses in the field of geography. In addition, the timing of the course “Applied Studies in Principal Geography” was changed during the reporting period and has now been moved to the third year, thus ensuring the most prepared and knowledgeable students for the applied study places. At the beginning of the second year of study, students choose Part B courses of 9 CP from the following courses: “Settlement and Economy of Latvia”, “Soils and Wildlife of Latvia”, “Paleogeography”, “Geographies of youth people in the everyday space of activities” and “Data processing in CAD environment”. In the fourth semester, students continue to develop their specific knowledge in the Geodesy, Population and Settlement Geography, GIS Basics in ArcView, and Resources and Planning of Territorial Development courses. In addition, courses in other programmes such as “Quaternary Geology” and Natural Diversity and Protection are also offered.

There are more B-part courses in the third year than in the second. In Part A, students take courses on “Earth Remote Sensing” and “Data Analysis in Environmental and Geosciences”. In the fifth and sixth semesters, 8 and 10 CPs must be collected, respectively. In the fifth semester, students have an opportunity to take courses on “Cultural Geography”, “Political Geography in the Changing World”, “Climate and Surface Water of Latvia”, “Science of Mires”, and a new interdisciplinary course “, Spatial Analysis for Sustainable Cities and Societies”. There is also an opportunity to take the “Geology of Latvia” course from the BSP “Geology”.

In the third year of study, it is particularly important to offer courses in the field of geography that are both thematically rich and useful for future education and career choices. Students can choose from the following courses: “Introduction to the Economic Geography”, “Weather Practical Forecasting”, “Polar Geography”, “Fundamentals of Tourism Geography”, and “Applied Studies in Principal Geography”. It is vital that students of BSP “Geography” can choose from courses offered by BSP “Geology” and BSP “Environmental Science”, such as “Ecology with Basics of Landscape Ecology”, “Assessment and Management of Resources”, “Evolution of the Earth” and “Applied Geology”.

In Part C of the programme, students choose a free choice course of 2 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.**

Both oral, written, and combined study and assessment methods are used during the study courses and examinations.

The 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 (e.g. in courses such as Population and Settlement Geography, Climatology and Basics of Meteorology, Political Geography in the Changing World). Practical assignments, seminars, individual, pair and group work, discussions and project development, and study tours to industry organizations are widely used. Employers are involved in the implementation and improvement of study courses (they are invited to conduct individual seminars, often the classes are organized as work experience visits, etc., e.g. in the study courses “Cartography”, “Science of Mires”).

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 (e.g. in the study courses “Earth Sciences”, “Soil Science”, “Geomorphology”, or “Human Geography”, “Population and Settlement Geography”, “Introduction to the Economic Geography” or “Cartography”, “Geographic Information Systems”, “Earth Remote Sensing”, etc.). Senior year students are involved in peer teaching-learning.

Study courses seminars promote students' presentation and discussion skills (e.g. in the courses “Introduction to Geography Studies”, “Geography of Latvia”, “Landscape Geography”, “Settlement and Economy of Latvia”, “Evolution of the Earth”, “Bachelor Thesis Project” and “Bachelor Thesis”).

To aid students in achieving learning outcomes – in acquiring and consolidating knowledge, skills and competence – the study process is dominated by student-centred methods. The study process is supported by methods that facilitate students' communication in the implementation of study tasks, solving real-world problems, and modelling situations (e.g. in the study courses “Geomorphology”, “Tourism Development Resources and Planning”, “Data Analysis in Environmental and Earth Sciences”).

The physical environment of studies is also gradually changing: classrooms are easily transformable for group work and individual work, and students can use digital technologies. Lecturers mainly use methods that encourage students' active participation, critical thinking and reflection. The e-learning environment is used in the study process and to promote independent studies. Each study course has an e-learning environment (Moodle) where students have access to lesson materials, task descriptions in addition to course-related learning materials, and 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-learning environment.

The student-centred approach is followed in updating the study programmes and the respective study courses, paying particular attention to the meaningful formulation of learning outcomes, thus promoting dialogue between lecturers and students on the content of studies, forms and methods of organization. On the other hand, well-formulated learning outcomes promote students'

understanding and co-responsibility for their learning, self-assessment, and understanding of the assessment they receive. During the study process, lecturers use methods, examination forms and assessment criteria appropriate to the study goal and planned to learn outcomes.

Students receive support and feedback from the lecturers during the study process. Grading criteria for marking are made public in advance. The assessment allows students to demonstrate the extent to which they have achieved the expected learning outcomes.

Student mobility and the recognition of academic results are promoted in line with the principles of student-centred education. Students mainly visit universities in other European countries as part of the ERASMUS+ programme. In the Bachelor's study programme “Geography”, students often choose to go to the Czech Republic, the Netherlands, and Finland. Upon returning to study at the University of Latvia after a semester spent abroad, the results of their studies are recognised – equated to the results of studies of the academic study programme “Geography”. Before departure for exchange studies, in close cooperation with the relevant programme director of the University and the mobility officers of the host university, a study plan is drawn up so that it corresponds in content to the relevant study plan at the University by the ERASMUS+ documentation. When students arrive at a foreign university, plans are coordinated and, if necessary, changed. The curricula and programmes of different universities are not a close match, so Part A courses align with the UL's study programme, but Part B courses count towards the thematically relevant course. The period spent in the exchange programme contributes to their individual development and improves the quality of studies in the BSP “Geography”, as students gain additional knowledge, skills and competencies.

Students are encouraged to get involved in research initiated by academic staff. This is often done in the framework of the “Applied Studies in Principal Geography” course. Students are involved in research, and organisational work, gaining valuable experience through testing gained knowledge and skills in practice. Examples include the National Research Programme project “Towards sustainable development and inclusive society in Latvia: response to demographic and migration challenges (No VPP-IZM-2018/1-0015) and the EU LIFE Programme project “Restoring grasslands and promoting their diverse use” (LIFE16NAT/LV/ 262).

By implementing internal quality assurance policies, study programmes are implemented to encourage students to participate in the improvement of the study process actively. There are procedures and regulations for submitting student proposals and complaints and reviewing student appeals. Students of the course “Introduction to Undergraduate Studies in Geography” are familiar with submitting proposals. This is done by the programme director, but the Study Centre, the programme assistant and the faculty secretary also provide essential support to students by coordinating correspondence to the zeme@lu.lv e-mail address. The results of student surveys are processed and taken into account for the improvement of the study process. Students are eager to express their proposals for improving study programmes and processes in discussions with the teaching staff and programme director.

The COVID-19 pandemic posed a significant challenge and burden when the study process had to adapt rapidly to a remote setting. Overall, the impact of distance learning on the quality of studies is assessed as unfavourable. This is mainly due to a loss of motivation among students and difficulties in providing practical, laboratory and fieldwork. The results of the student survey show these challenges. However, distance learning allowed both students and lecturers to rapidly develop skills and competence in working with MS Teams, Zoom and other tools, to use the e-learning environment more widely, and offer innovative solutions for practical work.

The program is implemented in both "Full-time studies" and "Part-time studies", as well as in Latvian and English languages. Differences in the implementation of various forms are applied

according to the need and the specified format. During the accreditation period, students with English as the language of instruction were not admitted. This is planned for the next accreditation period. The use of English in the implementation of the program is related to the admission of ERASMUS+ students. During the accreditation period, students were also not admitted to part-time studies, which are related to other priorities during the period, such as creating new interdisciplinary study courses, modernizing the study plan, and changing the program director. The amount and quality of knowledge acquired by part-time, part-time students are equivalent to full-time studies but take place over a longer period (8 semesters).

**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.**

At the end of the Bachelor's study programme “Geography”, a Bachelor's thesis must be completed. The final thesis must be prepared following the UL Order “Requirements for the Preparation and Defence of Final Theses (Bachelor's, Master's, Diploma and Qualification Theses) (11.02.2020.Order No.1/454 of UL) and the FGES Regulations “On the Procedure for the Preparation and Defence of Final Theses in Geography, Geology, Spatial Planning and Teacher Professional Study Programmes” (https://www.geo.lu.lv/studijas/studentiem/nosleguma-darbi/izstrade-un-aizstavesanas-kartiba/; approved at the Faculty Council meeting on 19 March 2018, available only in Latvia). The final thesis is evaluated by the final examination board of the Bachelor's study programme “Geography”, and by evaluating the submitted thesis and the given presentation and considering the recommendation included in the reviewer's reference, the overall evaluation is given.

The choice of themes for the final thesis of the Bachelor's study programme “Geography” is made according to the student's interests, in consultation with the teaching staff whose themes interest the student. As of the academic year 2021/2021, the scheme for the final thesis has been

streamlined, i.e. undergraduate students are guided towards defining their research topics, starting with the course “Introduction to Geography Studies”, where they learn the basics of geographical research. In the second year of study in the study course “Geography of Latvia”, students develop a course paper, which, if the student's interests are unchanged, serves as a basis for the development of the Bachelor’s thesis project and Bachelor’s thesis in the third year of study.

The final thesis must meet the basic requirements of a scientific thesis:

- there must be scientific research in one of the sub-sectors of geography;

- the result should be based on data from field studies, relevant literature, other sources of information and personal research;

- the course of the research must be logical, sequential, the result generalizable and unambiguous;

- common terminology and standardized abbreviations must be used in the paper;

- the work must be written in such a way that the author's views can be easily distinguished from those of other authors;

- the presentation of the content must be precise, clear, logical, and specific;

- the work must be written in the correct official literary language.

In the reporting period, since the previous accreditation of the study field, the themes and quality of bachelor’s theses defended in the study programme indicate achievement of study outcomes. Since 2016, 146 final theses have been developed and defended in the programme. In the reporting period, the final theses were evaluated predominantly with the rating of good and excellent (7 - 10). Still, there were also a small number of final theses that, in the view of the final thesis evaluation committee, received the rating of 5 and 6, indicating the mediocre quality of the thesis (Fig. 6).

A detailed analysis of the final assignments showed that students need additional support and skills development in the preparation of presentation material and in the development of presentation skills, public speaking skills and the ability to express their opinions. Despite the remote defence of 2021, the students showed great adaptability to the given circumstances, and the final theses defence took place in a streamlined and positive atmosphere.

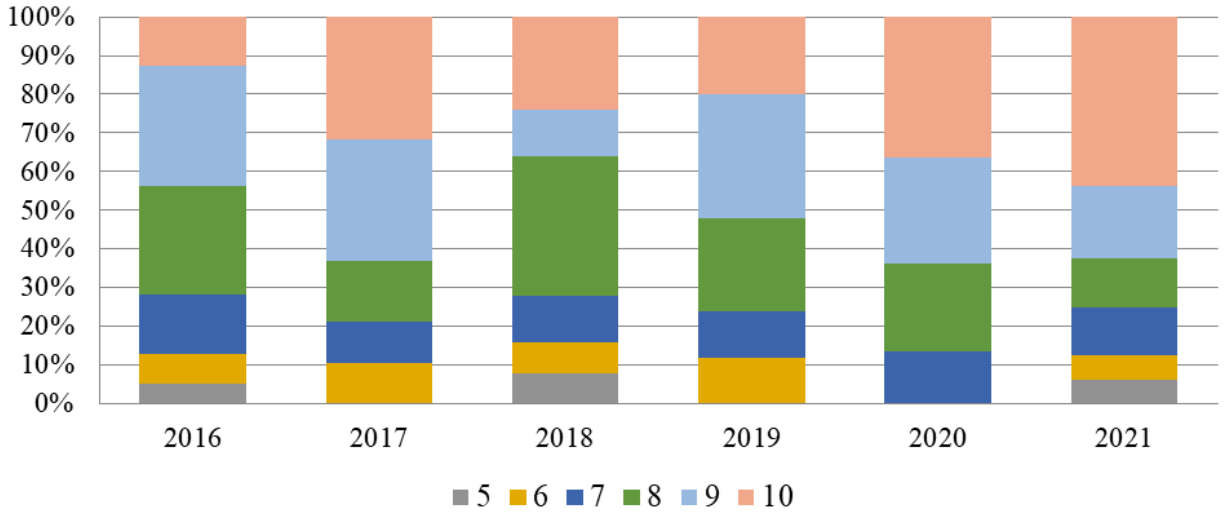



*Figure 6. Evaluations of the final theses of the Bachelor's study programme “Geography” in 2016 - 2021*

During this period, the defended theses have received grades ranging from 5 (average) to 10 (excellent). High grades – 8-10 – dominate. This generally reflects the diligence and willingness of the bachelor's students to work on valuable research work rather than just obtain a degree. The support provided at the end of bachelor's studies is a strong motivator for starting further studies, which is most often the master's program "Geography".

Confirmation of the implementation of the programme's objectives is a bachelor's thesis developed independently by the student, where the scientific quality is supervised by the supervisor and/or consultant selected by the student. The themes of the bachelor's thesis are chosen from a wide range of contemporary scientific problems in one of the sub-disciplines of geography. Traditionally, the final theses are thematically structured in 3 main sub-disciplines, which also correspond to the division of the Department of Geography into three chairs: 1) natural geography; 2) human geography; 3) geomatics and geomorphology, which correspond to the internal thematic division of the teaching staff of the department.

To appreciate the holistic approach of geography to studying nature-human interactions and the diversity of methods, it is essential to look at the range of topics developed at the end of the Bachelor's studies.

The choice of thesis supervisors and topics often undergoes natural changes related to the implementation of research projects at the faculty and student's interest in a particular research topic. Traditionally, natural geography research has focused on Latvia's climate in the context of global change, its extremes, changes in the hydrological regime and influencing factors, distribution patterns of flora and fauna in Latvia, soils and land use. The development of the final thesis in the field of phenology is also stable. Final theses in geomorphology on using marsh and lake sediments to reconstruct post-glacial palaeoenvironmental conditions are still relevant.

Examples of themes for final theses:

- Afforestation as a form of peatland rehabilitation and assessment of its influencing factors in reducing GHG emissions from peatlands.

- Changes in plant species diversity after the restoration of the hydrological regime of a raised bog.

- Ringing phenology of barn owls (*Asio otus*) and factors influencing it.

- Reconstruction of the Holocene fire regime in the vicinity of Bricu Lake, Vidzeme Highlands.

- Modern climate extremes in Latvia: analysis of very severe thunderstorms.

- Comparison and suitability of forest fire hazard prediction methods for Latvian conditions.

- Long-term assessment of seasonal peak river flows in the Western and Central Latvian hydrological regions.

The selection of appropriate final theses during the reporting period has provided a large number of theses in the fields of applied geography and geomatics. The knowledge students acquire in the Geographical Information Systems (GIS), cartography and remote sensing courses is considered unique.

Examples of themes for final theses:

- Monitoring of Lake Babīte vegetation using remote sensing and GIS methods.

- Modelling of ancient roads in the land of Bandava using GIS tools.

- Using drones to document cultural heritage sites: the case of the castle of Araiši.

- Application of photogrammetry in forest management planning.

- Assessing the utility of LiDAR data for bird large nests.

- Using Sentinel-1 Synthetic Aperture Radar for felling detection.

The work on human geography, on the other hand, highlights the changing world and the vital role of population movement and mobility. Emphasising migration, daily movement, demographic change, and studying the socio-spatial distribution of human settlements as one of the cornerstones of the science of geography.

Examples of themes for final theses:

- Labour migration patterns in Latgale region.

- Impact of the Daugava Right Bank Transport Arterial on the distribution of population.

- Geographical structure and features of internal migration and commuting in the united Bauska Region.

- Distribution of believers of the Latvian Baptist Union in Kurzeme.

- Changes in the rural landscape of Susaji municipality.

- The uneven ageing of regions: the role of internal migration in Vidzeme.

- Distribution of Old Believers in Latgale from 1925 to 2011.

The final theses of the Bachelor's degree programme demonstrate the importance of research-based studies in the disciplines represented by geography.

In general, it can be concluded that the topics of the bachelor's theses are relevant to the title and content of the study programme, as well as the results of the research conducted by students, and are topical in geography. The results of the research and projects presented in the theses demonstrate that the degree candidates have an in-depth knowledge of one of the fields of geography and the ability to independently obtain, summarise and interpret the results of their work, which enables them to carry out research activities and develop a research project at a high professional level.

In recent years, the number of bachelor theses developed in human geography and geomatics fields has increased. This confirms the study program's connection with the labour market's demand and the growth of students' interest directly in connection with future jobs. The students' final work topics are relevant in all sub-fields of geography, covering the latest scientific knowledge and the problems of applied aspects.

## 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 infrastructure of the Natural Sciences Academic Centre allows students to stay and study in modern classrooms with interactive whiteboards and learn practical skills in spacious, well-equipped laboratories.

The courses in the study programme are created in the estudijas.lu.lv Moodle environment. The materials necessary for studying are regularly placed there, as well as the instructions for successful course learning and daily communication between students and teaching staff. Interim tests and exams are created in estudijas.lu.lv, midterm grades are recorded, and the final course grade is calculated. Students can keep track of this information by logging in with the student profile details.

Students of the Bachelor's study programme "Geography" are provided with an adequate information base for studying the courses and elaboration of final theses, which is ensured by the location of the Natural Sciences Library on the premises of the UL House of Nature, the location of the Science Library in the adjacent House of Science, as well as access to a wide range of publication databases offered by the University of Latvia: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/.

The material and technical support available for implementing the study field are used for implementing the BSP "Geography". The material and technical provisions are renewed every year using the science base financing of the UL and the FGES and project funds. Every year we work on supplementing and improving the spatial data collection in the Map Browser of the FGES. It includes topographic maps, thematic maps, orthophoto map collections of the 6$^{th}$ cycle with Latvian territorial coverage, and a terrain model of Latvia covering all the essential data in its structure. An incomplete topographic map of the Latvian Geospatial Information Agency (LGIA) on a scale of 1:10 000 is available in the Map Browser. About 60% of the territory of the Republic of Latvia has access to the LiDAR data model, in which it is possible to measure the height of the earth's surface (relief) and create profiles (research-oriented).

The only Latvian (FGES) Map Browser contains Latvian agricultural land (cadastre) – soil maps and land valuation maps. The vector data of these agricultural lands prepared within the framework of the FGES project are available in e-Latvia and can be accessed by everyone. In the academic year 2020/2021, the Map Browser has been updated with new layers, maps of Riga City, 1883, in scale 1:2100, maps of Western Russia, in scale 1: 100 000 - 1, 1915-1920, including Vidzeme, maps from before World War I and maps of collective farms and Soviet farms in the USSR were obtained. The browser is available to users registered in the UL network.

**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 Bachelor's study programme "Geography", the University of Latvia uses:

- a state budget grant from the Ministry of Education and Science, which in the academic year 2021/2022 is set at EUR 3097 for full-time studies;
- tuition fee, taking into account all the factors referred to in the section "Financial support", which in the academic year 2021/2022 is set as follows:
- 2000 EUR per year for full-time studies;
- 2000 EUR for full-time international students (EU and EEZ citizens).
- 1500 EUR for part-time extramural studies

Taking into account the above, the total budget of the study programme is expected to be 327 thousand 721 EUR per year; the data are shown in Table 16.

*Table 16.*

*The estimated annual income of the programme, EUR*

| Type of Study | Number of students | Tuition fee/state grant | Total income |
|---|---|---|---|
| FTS (budget) | 100 | 3097 | 309 721 |
| FTS (fee) | 9 | 2000 | 18 000 |
| Part-time extramural studies | 0 | 1500 | 0 |
| International students | 0 | 2000 | 0 |
| **Total** | | | **327 721** |

**Programme costs**

To estimate the amount of funds required for financial provision, the cost of study programmes at the University of Latvia is calculated according to the methodology developed by the University of Latvia, which takes into account the costs of providing the study process and information on the study programme plan, reliability of forecasts.

**The full-time study programme costs**

For calculations, the study programme "Geography" implementers use students' data for the academic year 2020/2021 – 109 students studying in the programme at the FTS, the

existing/planned study programme plan after accreditation and the current structure of the involved academic staff. Considering the above, the estimated full-time cost per full-time student of the programme is 2179 EUR per year, and the total cost of the programme is 129 040 EUR per year. A more detailed percentage cost breakdown is shown in Table 17a.

*Table 17a.*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 45.7% |
| General staff | 8.0% |
| Other payments | 9.2% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |
| **TOTAL COST** | **100.0%** |

Figure 7 shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

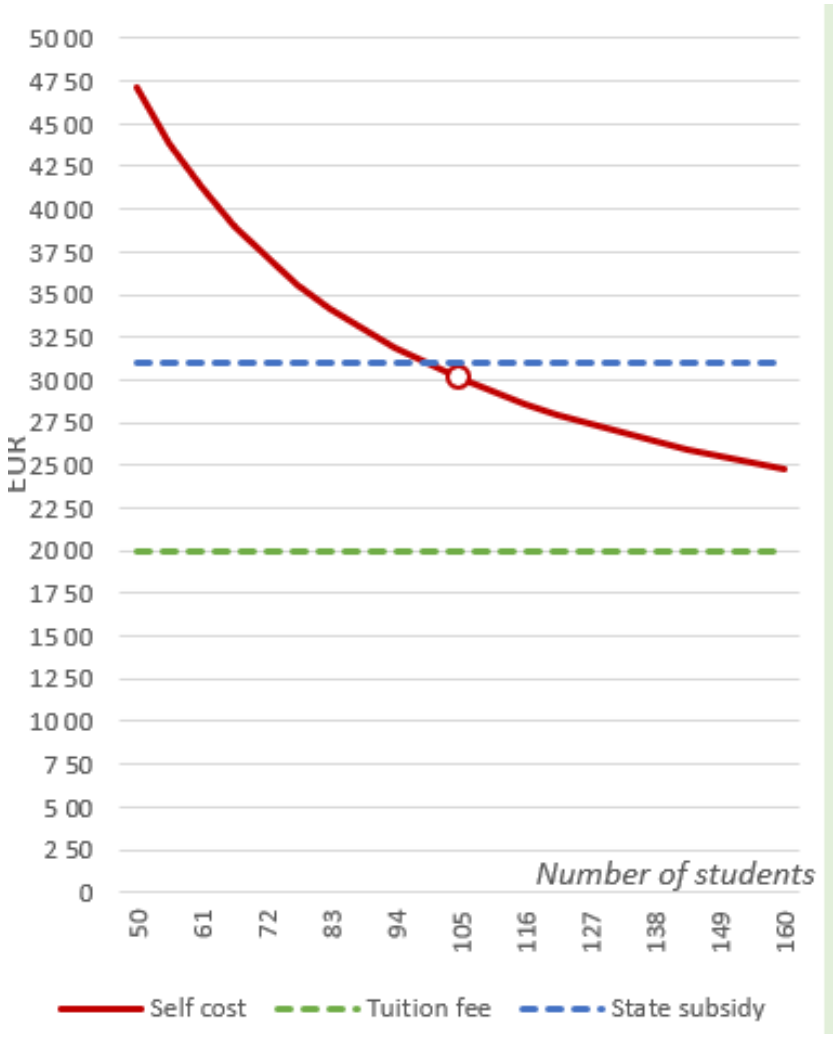



Figure 7. Cost per full-time student enrolled for the BSP "Geography."

Based on the calculation, it can be seen that for the programme to be profitable and provide students with a quality study process, the number of fee-paying students in the programme (all courses combined) must be at least 127 (intersection of red (cost) and green (tuition) lines projected on the x-axis). On the other hand, if there were only budget students in the programme, their number should reach 105.

**The full-time extramural study programme**

For calculations, the study programme "Geography" implementers use students' data for the academic year 2020/2021 – 40 students studying in the programme at the FTS, the existing/planned study programme plan after accreditation and the current structure of the involved academic staff. Considering the above, the estimated part-time extramural cost per part-time student of the programme is 1563 EUR per year, and the total cost of the programme is 61575 EUR per year. A more detailed percentage cost breakdown is shown in Table 17b.

*Table 17b.*

*Percentage breakdown of costs in the study programme*

| Expenditure item | % of total |
|---|---|

| | |
|---|---|
| Teaching staff | 45.7% |
| General staff | 8.0% |
| Other payments | 9.2% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |
| **TOTAL COST** | **100.0%** |

Figure 8 shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

Based on the calculation, it can be seen that in order for the program to be profitable and for students to be provided with a high-quality study process, the number of fee-paying students in the program (in all courses together) should be more than 45 part-time extramural students.

**Summary of program revenues and costs**

In table 19a. programme revenues and costs are given.

Table 19a.

Program result

| Type of Study | Number of students | Tuition fees/state subsidy | **Total income** | **Total cost** |
|---|---|---|---|---|
| Part-time studies | 40 | 1500 | 60000 | 61575 |

**Summary of the revenue and expenditure of the programme**

Following table 19b summarizes the programme revenue based on the number of students, state grants and tuition fees, and the programme expenses for such a number of students.

*Table 19b.*

The result of the programme

| Type of Study | Number of students | Tuition fees/state subsidy | **Total income** | **Total cost** |
|---|---|---|---|---|
| FTS (budget) | 100 | 3097 | 309 721 | 300 500 |
| FTS (fee) | 9 | 2000 | 18 000 | 27 045 |

| | | | | |
|---|---|---|---|---|
| Part-time studies | 0 | 1500 | 0 | 0 |
| International students | 0 | 2000 | 0 | 0 |
| **Total** | | | **327 721** | **327 545** |

The table's data clearly shows that the University of Latvia has sufficient resources to implement the study programme and ensure its further development. In addition, the development of the programme can be financed from the revenues 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 the development of programmes from the UL Study Quality Improvement Fund.

## 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 reporting period, 23 lecturers taught courses in geography or its sub-disciplines in the Bachelor's study programme “Geography”, while in the academic year 2021/2022, a total of 42 lecturers participated in the implementation of the BSP “Geography”. In the period since 2017, several significant development activities have taken place in the Bachelor's study programme "Geography" for the professional development and renewal of the teaching staff. In the academic year 2021/2022, the teaching staff of BSP “Geography” consists of 6 professors, 10 associate professors, 14 assistant professors, 12 leading researchers, researchers, and lecturers (Table 19). The number of professors and associate professors (16) is in full compliance with Article 55(1)(3) of the Law on Higher Education Institutions, which stipulates that "not less than five professors and associate professors who have been elected to academic positions at the respective higher education institution shall participate in the implementation of the compulsory part and the restricted optional part of academic study programmes".

Research activities of academic staff, participation in the development of international and Latvian Council of Science  funded projects have a positive impact on the study process. The research activities of the teaching staff are closely related to the courses they teach, such as Biogeography, Soil Science, Population and Settlement Geography. Research activities ensure the development and excellence of the research area and thus strengthen the content of the courses. In the fields of excellence represented by geographers at the University of Latvia, in terms of the number and scientific quality of publications, the dominant fields are glaciers, Holocene and glacial geology

(prof. N. Stivriņš, assoc. prof. Lamsters and others) and in the social sciences, population migration (assist. prof. E. Apsīte-Beriņa, prof. Z. Krišjāne, assoc.prof. M. Bērziņš, researcher A. Lulle). For example, a new study course “Polar Geography” has been created within the framework of a project funded by the Latvian Council of Science. The qualification of the teaching staff helping to achieve the learning outcomes is reflected in the activities carried out in the project No. 8.2.2.0/18/A/010 “Renewal of Academic Staff and Improvement of Competences at the University of Latvia” conducted in 2019–2021. The teaching staff in the Bachelor's study programme “Geography” have been active participants in training.

The most important course is the English Language course (216 hours), which has been attended and certified (in most cases for the highest, i.e. C1 level) by lecturers E. Apsīte-Beriņa, M. Bērziņš, A. Dēliņa, L. Kalniņa, G. Kalvāne, R. Kasparinskis, Z. Krišjāne, E. Lukševičs, A. Markots, J. Paiders, Z. Penēze, S. Rūsiņa, Ģ. Stinkulis, I. Strautnieks, I. Šteinberga, A. Zariņa. Seven more staff members have started and are continuing their studies in the academic year 2021/2022.

Significant investment has also been made in the development of staff in the field of leadership, the certificate for the acquisition of  36 hours of training “Development of Academic Staff Competences in the Field of Leadership” have been obtained by: E. Apsīte-Beriņa, M. Bērziņš, L. Dobkeviča, G. Kalvāne, J. Karušs, Z. Krišjāne, I. Kukuļs, J. Lapinskis, Z. Penēze, S. Rūsiņa, I. Šteinberga.

The 36-hour course “Development of Digital Skills of the Academic Staff” providing for the digital upskilling, which was especially useful during the distance learning, was attended by: E. Apsīte-Beriņa, M. Bērziņš, L. Dobkeviča, G. Kalvāne, Z. Krišjāne, J. Lapinskis, E. Lukševics, Z. Penēze, N. Stivriņš, J. Ventiņš. In addition, E. Apsīte-Beriņa, L. Dobkeviča, I. Strautnieks, J. Ventiņš have acquired new knowledge in the use of the Moodle system. It is important to note that this course “E-vide Moodle. Practical recommendations in e-environment” has been developed and taught by one of the lecturers of the UL bachelor’s study programme “Geography”, assoc. prof. I. Šteinberga.

The training course "Digital Media Literacy (24 hours)" was attended by lecturers E. Apsīte-Beriņa, I. Grīne, Z. E. Peneze, I. Šteinberga. The 16-hour development course "Public Speaking, Speech Art and Presentation Fundamentals for Cooperation with Industry and Audience” has been completed by A. Dēliņa, L. Dobkeviča, G. Kalvāne, Z. Krišjāne, Z. Penēze, I. Silamiķele. A. Briede, L. Dobkeviča, G. Kalvāne, J. Karušs, A. Markots, I. Silamiķele attended the 16-hour refresher course “Commercialisation Training”. M. Bērziņš attended the 32-hour refresher course “Scientific Activity and Publication Skills”.

The project No 8.2.2.0/18/A/010 “Renewal and Competence Development of Academic Staff at the University of Latvia” still involves PhD students H. Ījabs and J. Krūmiņš, who continue their work and are preparing for the defence of their doctoral theses.

### 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 period since 2017, the Bachelor's study programme "Geography" has undergone a number of significant development activities for the professional development of the teaching staff and the renewal of the teaching staff. In the academic year 2021/2022, the teaching staff of BSP “Geography” consists of 6 professors, 10 associate professors, 14 associate professors, 12 leading researchers, researchers and lecturers (Table 19). The number of professors and associate professors (16) fully complies with Article 55 (1) (3) of the Law on Higher Education Institutions,

which stipulates that “at least five professors and associate professors together shall participate in the implementation of the compulsory part and the limited elective part of academic study programs, who have been elected to academic positions at the university concerned”. At the same time, the involvement of doctoral students in the study process is very important and successful. Among the teaching staff, among the assistant professors, leading researchers, there are several young colleagues who will form a full complement and replacement for the professorship in the future.

*Table 19.*

*Comparison of teaching staff in 2016 and 2021 in the Bachelor's study programme "Geography"*

| Academic position / Year | 2016 | 2021 |
|---|---|---|
| Professors | 7 | 6 |
| Associated professors | 5 | 10 |
| Assistant professors | 14 | 14 |
| Leading researchers, researchers and lecturers | 13 | 12 |
| IN TOTAL | 39 | 42 |

Normunds Stivriņš, who is active in the field of post-glacial palaeoenvironmental research, was elected in the position of professor during the reporting period. Four members of teaching staff were elected as associate professors: S. Rūsiņa, A. Zariņa, M. Bērziņš and K. Lamsters. Their relevance to the field is demonstrated by their scientific publications, participation in projects, and their expertise in Earth Science, Physical Geography and Environmental Science, and Social and Economic Geography. Within the framework of BSP “Geography” the renewal of the teaching staff is in progress, for example, the director of the study programme assist.prof. E. Apsīte-Beriņa took up the position at the end of the postdoctoral project. A successful example of faculty renewal can also be observed in the case of assoc. prof. K. Lamsters. Following the successful completion of his postdoctoral project, he was elected to the position of associate professor and took over the Part A course “Geomorphology” taught by the experienced Emeritus Professor V. Zelčs. The professional development and renewal of the teaching staff of the Bachelor's study programme “Geography” is positively evaluated and is directed towards the acquisition of versatile, modern and high-quality higher education.

**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).**

The courses of the Bachelor's study programme “Geography” in geography or its sub-sectors in the reporting period consisted of 23 lecturers. Still, in the 2021/2022 academic year, a total of 42 teaching staff members participated in the implementation of BSP “Geography”. The average number of students over the five years was 112. The teaching staff ratio per student is 1:2.67, sufficient to ensure quality higher education.

The cooperation of the teaching staff of the study program "Geography" is highly appreciated. Cooperation is promoted by teaching interdisciplinary courses. Formally, questions related to the improvement and development of the study process are referred to the Study Program Council, which since May 2020, has considered proposals for improving the study process, taking into account the students' assessment of the study course.

The programme management also facilitates the cooperation of the teaching staff by regularly meeting and/or communicating electronically with the lecturers to discuss and coordinate the study process. Study issues are discussed in individual conversations and periodically reviewed by the Study Field Council.

The mutual dialogue of the teaching staff and students involved in implementing the Bachelor's study programme “Geography” regarding the need for improvement or changes in the study process is organized with the help of the Study Field Council. Regular exchange of information, mutual understanding and explanatory work between all parties involved in the BSP “Geography” has brought significant structural and substantive changes.

The teaching staff's primary responsibility is to ensure that the content of study courses is up-to-date and modern, adapting them to new requirements and trends, which is done using the Moodle environment estudijas.lu.lv. The quality of course descriptions is maintained by observing the academic standard in developing all course descriptions and being aware of the importance of the information in ensuring a quality study process. The teaching staff follow the principles of student-

centred education while being aware of the scientific orientation of the academic study programme and the need to motivate and prepare students for scientific activities. Cooperation with employers (some of whom are also teaching staff) is ongoing to improve the content of study courses in line with employers' perspectives.

Significant changes in the mechanisms of faculty collaboration have occurred with remote learning due to the COVID-19 pandemic. The teaching staff and students of the Bachelor's study programme "Geography" have shown high adaptability during this period. The most significant changes have occurred in the change of previous action models, for example, an operative adaptation of lectures, application of materials to ensure synchronous and asynchronous learning, and adaptation to the requirements of technologies. As a result of students' initiative, during this period, the teaching staff created lecture recordings, improved materials and video lectures, and added additional interactive learning tools.

Collegiality issues have also been necessary for the practical delivery of lectures during this period. Particularly challenging have been situations where teachers have had to adapt to a combined or hybrid approach to lectures and practical work.  These are determined by the situations when the lecturer works in the classroom.in person, while some students log in remotely. Overall, the adaptability of the teaching staff is considered to be very high. In situations where process improvement measures have been necessary, this has been done in the dialogue between the teaching staff, students and the programme director and the Dean of the faculty.

# 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 | Sample of diploma and its supplements to be issued for the acquisition of the study programme Appendix 21.docx | Par studiju programmas apgūšanu izsniedzamā diploma un tā pielikumu paraugs 21.pielikums.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) | Council of Higher Education Opinion Brief Appendix 22.docx | Augstākās izglītības padomes atzinums atbilstoši Augstskolu likuma 55. panta otrajai daļai.docx |
| 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 | Statistical data on students in bachelor study programma Geography during reporting period_Appendix 23.docx | Statistika par bakalaura studiju programmā Ģeogrāfija studējošajiem pārskata periodā_23.pielikums.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 | Compliance of the Bachelor's study programme Geography with the State Education Standard Appendix 24.docx | Studiju programmas atbilstība valsts izglītības standartam_24.pielikums.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 | Mapping of study courses of the Bachelor's study programme Geography Appendix 25.docx | Bakalaura studiju programmas "Ģeogrāfija" studiju kursu kartējums 25.pielikums.docx |
| The curriculum of the study programme (for each type and form of the implementation of the study programme) | Bachelor's study programme Geography study plans_Appendix 26.pdf | Bakalaura studiju programmas "Ģeogrāfija" studiju plāni_26.pielikums.pdf |
| Descriptions of the study courses/ modules | Course descriptions of bachelor study programm Geography_Appendix 27.pdf | Bakalaura studiju programmas "Ģeogrāfija" studiju kursu apraksti 27.pielikums.pdf |
| 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) | Certification that academic staff of the academic study Geography bachelor programme complies with the requirements laid down in Section 55 Appendix 11.docx | Apliecinājums, ka akadēmiskās studiju programmas akadēmiskais personāls atbilst Augstskolu likuma 55. panta pirmās daļas trešajā punktā noteiktajām prasībām.docx |

# Geography (45442)

| | |
|---|---|
| Study field | *Geography and Earth Sciences* |
| ProcedureStudyProgram.Name | *Geography* |
| Education classification code | *45442* |
| Type of the study programme | *Academic master study programme* |
| Name of the study programme director | *Agrita* |
| Surname of the study programme director | *Briede* |
| E-mail of the study programme director | *agrita.briede@lu.lv* |
| Title of the study programme director | *Profesore, Dr.geogr.* |
| Phone of the study programme director | *+371 26462328* |
| Goal of the study programme | *To provide students with advanced knowledge and re-search skills in the theory and practice of contemporary geography, preparing them to become specialists in the integrated solution of spatial, natural and human envi-ronmental problems in academic and professional fields.* |
| Tasks of the study programme | *To achieve this goal, the study programme has the follow-ing objectives:*<br>*1) to provide opportunities to acquire up-to-date knowledge of the general trends and developments in the field of geography, as well as the most important con-cepts, theories and methodologies in the sub-fields of ge-ography;*<br>*2) to provide an opportunity to explore and understand the problems in the field of geography and to apply ap-propriate methodologies to problem-solving situations;*<br>*3) to facilitate the development of skills and competences and critical thinking necessary for scientific research to be performed in the Master's thesis and for further doctoral studies.* |

| | |
|---|---|
| Results of the study programme | *KNOWLEDGE*<br>*1. Demonstrate extended knowledge and understanding of the approaches used in the field of geography and the most important terminology in the interpretation and solution of various problem situations.*<br>*2. Show in-depth knowledge of theories, concepts, methodologies of a geography sub-sector.*<br>*3. Know the scope of study required for independent research, the methodological frameworks required for solving geographical problem situations in research and professional activities.*<br>*SKILLS*<br>*4. Formulate and solve problems in the field of geography, using the critical thinking approach and applying the latest or innovative methods in problem solving.*<br>*5. Independently use the appropriate branch of geography approach and methodology for research or applied work.*<br>*6. Independently promote the development and specialization of their competencies, take responsibility for the results of group work and its analysis.*<br>*COMPETENCE*<br>*7. Independently formulate and critically analyse complex scientific and professional problems, substantiate proposals for solutions.*<br>*8. Integrate knowledge of geography and related disciplines, contributes to the creation of new knowledge, development of research methods.*<br>*9. Demonstrate understanding and ethical responsibility for the potential impact of scientific results on the environment and society.*<br>*10. Offer reasoned opinion and discusses integrated or systemic aspects of the field of geography with specialists and non-specialists* |
| 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) | *Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in natural sciences. Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in other fields of sciences, and entrance examination* |

| | |
|---|---|
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Master of Natural Sciences in Geography* |
| 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 - 2 years - english**

| | |
|---|---|
| Study type and form | *Full time studies* |
| Duration in full years | *2* |
| Duration in month | *0* |
| Language | *english* |
| Amount (CP) | *80* |
| Admission requirements (in English) | *Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in natural sciences. Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in other fields of sciences, and entrance examination. Studies in English require English language skills in ac-cordance with the applicable laws and regulations (for foreigners - English language skills at least at B2 level.* |
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Master of Natural Sciences in Geography* |
| 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, certain changes have been made to the parameters of the Master's study programme “Geography” in order to increase the compliance of the programme with changes in regulatory acts i.e. the achievable study results have been specified in accordance with the Regulations on the Latvian Classification of Education (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas - the document is available only in Latvian, without official translation in English), as well as admission requirements were simplified.
Study results are structured as knowledge, skills and competence, and are divided into 10 subsections.
During the previous accreditation period, there were requirements for matriculation of persons with a Bachelor's degree in Natural sciences (or equivalent higher education), Engineering sciences or Social sciences.
Currently, matriculation requirements are differentiated depending on the field of previous education. Persons with Bachelor's and/or Master's degrees or second-level professional higher education, or equivalent higher education in natural sciences, enrol in the program without organizing an entrance examination. If such an education has been obtained in other fields, an entrance exam is organized, where the person's previous experience and competence in geography is checked, determining the ability to study geography at the Master's level. This provides an opportunity to study in the Master's degree in Geography also for persons who are practically active in fields related to geography, but have obtained a bachelor's degree from fields more distant from geography.

### 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 “Geography” has been developed and is being implemented at the Geography Department of the University of Latvia, as one of the stages of a full cycle of academic education in geography. The programme was accredited on April 24, 2017 for 6 years – until April 24, 2023.

The implementation of the Academic Master's study programme "Geography" is in line with the aim

and objectives of the study field "Geography and Earth Sciences", as well as the needs and trends of the development of society and the economy. Its relevance is determined by its affiliation to the natural sciences, as evidenced by the Master of Natural Science degree in Geography. The title of the Academic Master's study programme "Geography", the degree to be obtained and the qualification to be awarded are interlinked, as they enable the acquisition of in-depth knowledge, skills and competences and directly correspond to the field of study and the title of the study programme. From them follow the aims and tasks of the programme, as well as the learning outcomes that correspond to the master's level geography studies.

The first two digits of the programme code (45442) indicate the level of study – academic education (Master's degree), while the third-fifth digits (442) correspond to the field of study - Geography and Earth Sciences. Hence, the programme code is correct and matches the other program parameters.

The knowledge, skills and competences acquired within the study programme correspond to the Latvian Qualifications Framework (LQF) level 7, which is also confirmed by the mapping of study courses attached (see Annex "Mapping of study courses of the Academic Master's study programme "Geography"").

The duration of the study programme is 2 years (4 semesters), during which all students of this programme are required to study mandatory study courses (Part A 44 CP), elective study courses (Part B 32 CP) and free elective study courses (Part C 4 CP). In order 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 "Geography" is 3 years. The total duration of higher education for a Master's degree is therefore 5 years, in line with the Lisbon Convention (1997), the Bologna Declaration (1999) and other international instruments governing higher education. However, as previous experience also shows, until 2007, when Bachelor's and Master's studies were implemented in a 4+2-year format, the knowledge and practical skills of the graduates of both levels of programs were better. Balancing the level of knowledge and practical skills of graduates, their desire to participate in the labor market as quickly as possible, as well as the duration of studies, the current duration of studies is optimal.

The right to continue academic studies in a Master's study program is after completing a Bachelor's program or a second-level Professional Higher education program, if the relevant Master's study program admission requirements have been met, which include appropriate prerequisites for successfully completing the Master's study program.

The admission requirements comply with Clause 14 of the "Regulations on the State Academic Education Standard" of Latvia. They are relevant to the degree awarded as a result of acquiting the study programme, as it provides the opportunity to study geography at the master's level for all interested persons who have a bachelor's degree or an equivalent higher education in natural sciences. For those applicants, who have received previous education in other fields, the ability to study geography at the Master's level is controlled with the help of an entrance examination.

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

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

2) the motivation for the choice of study, the intended field of study;

3) experience in research, presentations at scientific conferences;

4) internships at foreign universities and research institutions;

5) relevance of the topic of the Master's thesis and its correspondence to current research

directions in geography;

6) the development of the Master's thesis.

A score is assigned for each of these points, and the overall result of the admission interview is included in the formula for calculating the total competition score.

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

The Master’s study programme “Geography” offered by the University of Latvia is the only institution for the training of geography specialists in Latvia. Competences of graduates of the Master's program "Geography" correspond to various areas related to spatial management and are employable in both environmental management, spatial and spatial development planning and the spatial management of public processes. Potential workplaces in Latvia have been identified and are as follows: territorial and environmental management institutions (Ministry of Regional Development and Local Government, Ministry of Environment and Regional Development (MoERD), State Regional Development Agency, State limited Company “Latvian Environment, Geology and Meteorology Centre” (LEGMC), Latvian Geospatial Information Agency (LGIA), regional and national environmental authorities, consulting firms, research institutes, as well as non-governmental organisations. It is important to note that the programme trains specialists in a growing body of research in the field of geography and its sub-disciplines, which is supported by core and performance funding, funding from the LSC, other research grants provided by Latvia and the European Union, as well as contract work.

The relevance of the programme to labour market demand is demonstrated by the results of regular alumni surveys. The October 2021 survey was completed by 46 respondents who graduated from the programme between 2016 and 2021. This anonymous survey of Master's graduates was created on the QuestionPro survey platform. The analysis of the results shows that 88.6% of the respondents were employed in a field related to their study programme. The highest percentage of graduates work in public institutions (68.3%) and in the private sector (26.8%). 73.2% responded positively to the question on the relevance of the job to the specialisation studied at the FGES. Of the 39 respondents to the question on the relationship between employment and education, 82% said that the education they received contributed to their employment. Summarising the results of the survey on employment, it can be seen that a significantly higher proportion of the graduates of the Master's degree programme “Geography” are employed in their chosen specialisation or in a related specialisation. Good results in graduate employment are also confirmed by the data of the Ministry of Education and Science of the Republic of Latvia on graduate monitoring.

The study programme in English is intended to study for people from both European countries and other parts of the world. Geography today is a broad area of science and practical activity, both in terms of the exploration of dynamic natural-society processes and socio-spatial processes, spatial planning and management issues and in terms of the application of GIS and remote research technologies to address various challenges.

The economic and social rationale for the implementation of the programme in English is as follows:

1) it offers opportunities for foreign students to understand the environmental, socio-ecological and

socio-spatial systems specific to the Baltic States region, which can serve as an important transfer of knowledge in solving common European and global problems;

2) it allows interested parties from other countries to extend their knowledge and learn in depth some issues of geography specific to Latvia;

3) at the same time, students are attracted to the LU, who develop and strengthen the geography science studies, promoting the recognition of the UL in the world

4) the competence of teaching staff improves and the quality of study materials improves.

**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.**

All students in the Master’s study programme "Geography" have studied in Latvian, except for exchange students, for whom lectures, practical, laboratory, field work and individual consultations have been conducted in English. The studies have been implemented with the state budget funds, the exception being in the academic year 2017/2018, when there was one fee-paying student. The total number of students in the reporting period varied from 27 to 45 students (see Annex “Statistical data on students in the Master's programme “Geography” in the reporting period”). For example, in the academic year 2021/2022, the number of students in the Master's degree programme “Geography” is 31. During the reporting period, an average of 2-4 students are ex-matriculated each year, which is a relatively high indicator given the small number of students in the programme. In individual discussions with students, it was established that in general the content of studies is satisfactory, but it is difficult to combine them with work. In most cases, this is the most important reason for dropping out. The second reason cited is health problems, which has been cited as a reason for dropping out in recent years.

Currently, five students are on academic leave, three out of five have passed the theoretical part but have not completed and defended their Master's theses.

Data show that the number of matriculated students has decreased over the last six years compared to the previous accreditation period, as has the number of graduates. There are several reasons for the decrease in the number of matriculated students. First, it is determined by the low demographic indicators of the group of young people who have completed their studies, which has influenced the decrease in the number of students already in the bachelor's study.

**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 "Geography" has been developed in accordance with the interrelation and sequence of study courses, thus enabling the maximum achievement of the study programme goal. In order to ensure this, ten elements of the set of knowledge, skills and competencies to be acquired as a result of acquiring the study programme have been formulated. Specific study courses were developed, taking into account the outcomes to be achieved within the study programme, and the set of knowledge, skills and competences to be achieved within each individual course was defined. The correlation of the objectives and outcomes of the study programme with the outcomes of individual study courses can be found in each course description, which provides a description of the course content, defines the course plan, course learning requirements, outcomes, sources to be used (Annex “Course descriptions”). The study programme consists of parts A, B and C, which make up 44 CP (55%), 32 CP (40%) and 4 CP (5%) of the total credit points, respectively.

The mandatory part A of the academic MSP "Geography" consists of a Master's thesis of 20 CP and a Master's thesis project of 4 CP, which guides students in a focused and timely manner in the choice of the topic, aim and objectives of the research work. In order to ensure a better quality of the Master's thesis, the programme requires that the elaboration and defence of the Master's thesis be divided into several stages: 1) development and defence of the Master's thesis project in the 3$^{rd}$ semester and 2) development and defence of the final version of the Master's thesis in the 4$^{th}$ semester.

The remaining mandatory Part A of 20 CP consists of 7 study courses. For example, in the course "Introduction to Master Studies in Geography", students are not only introduced in detail to the programme, research and achievements of the FGES, but they are also given an opportunity to introduce themselves through an undergraduate topic developed in a previous phase of their education or other research experiences and topics of interest. This course is small, 2 CP, but it is important because it gives students coming from other faculties or universities the opportunity to get acquainted with research at the FGES and to get to know their fellow students, which is necessary to create a stimulating learning environment. The course "Nature and Society in the Anthropocene", 2 CP, is designed to provide insights into the development of ideas about human-nature interactions, the human-nature divide, climate, society and the environment in the Anthropocene. Research Methods in the Modern Geography Part I and Part II comprise a total of 6 CP. The theoretical part of this course provides a basic understanding of contemporary paradigms in geography and examines how they relate to different methodologies. The practical part of both courses focuses on creating knowledge and skills, applying quantitative and qualitative methods in a variety of geographical studies. In addition to the already mentioned courses, Part A includes the course “Landscape Ecology: Theory and Practice” (4 CP), where the object of research is landscape structure, functions and processes and their manifestations in time and space, as well as sustainable landscape management. The other two courses, "Globalisation and Development" and the "Field Course in Regional Geography", are to some extent related as that they teach critical

analysis of globalisation processes and their territorial manifestations and explain the development of different regions and countries. Based on the recommendations of graduates and employers and taking into account the trends in the field, the compulsory courses (e.g. Landscape Ecology: Theory and Practice, Globalisation and Development) are supplemented with topics and seminars involving professionals in teaching. In general, the study plan is designed in such a way that in the first 3 semesters students study various consecutive courses, while in the 4th semester the main focus is on the Master's thesis.

If, as a result of the mandatory Part A courses, students can deepen their knowledge and demonstrate an understanding of the most important areas of modern geography and the concepts, theories and relevant methodologies of selected related sub-sectors, then the limited Part B courses allow them to demonstrate in-depth knowledge in one area of geography. The structure of the courses is characterised by a certain specialisation in natural geography, environmental and regional geography, and human geography. The study courses dominated by natural geography topics in interaction with human impact on ecosystems are “Earth surface systems” 6 CP, “Environmental geomorphology” 4 CP, “Global change and adaptation: hydroclimatologic and biogeographical processes”, “Forest landscapes and management” 4 CP, “Quaternary Palaeogeography and Palaeoecology” 4 CP. As most Part B courses use GIS as an analysis tool, students who have not completed a Bachelor's degree in Geography, or have insufficient skills and knowledge in GIS applications, are strongly advised to take “Introduction to Geographic Information Technology” or “ArcGIS Pro, Cartography and Spatial Representations” in Part B. Human geography and environmental and regional geography are predominant topics in the study courses “Geographical Mobility” 6 CP, “Urban Geography and Development” 4 CP, “Territorial Systems and Regions” 6 CP, “Space, Social Theories and Practices” 4 CP, “Logistics and Transport Geography” 4 CP. Part B of the programme includes an interdisciplinary course in geography and environmental science on “ Contemporary Approaches to Studies of Places and Environment”, where the theoretical part provides a basic introduction to contemporary approaches in the geography of interactions and environmental philosophy.

Theoretical and practical solutions for developing, managing and evaluating project ideas that meet the demands of today's labour market are covered in the courses “Geoscience Projects” and “Strategic Management and Project Management”. Similarly, the study courses “Applied Studies in Geography” and “Applied Research Project in Geography” are designed to develop academic and professional competences based on practical skills, as well as acquired methods of collecting, processing, analysing and systematising information in one of the sub-disciplines of geography.

Likewise in the restricted electives part B, the possibility is offered to choose study courses from other Master's programmes of our faculty, for example, "Contemporary Geological Processes" 4 CP, "Modelling of Environmental Processes" 4 CP, "Environmental Planning" 4 CP, where the acquired knowledge and skills can be a good support for the integrated solution of natural and human environmental problems.

In Part C of the free elective programme, which consists of 4 CP, students are recommended to take a number of 2 CP courses. For example, "Sustainable Consumption Development and Management" or "European Environmental Policy: Theory and Practice", taught in English, which not only gives an understanding of the scope of environmental policy in the European context but also contributes to the development of English language skills. At the same time, this does not exclude the possibility for students to choose a Part C course that suits their interests from the offer of other faculties.

In general, the study courses and the teaching methodology of the study programme are aimed at acquiring in-depth knowledge in various sub-disciplines of geography, as well as at creating synergies with knowledge in other fields (e.g. environmental science, social and economic

geography), as today's labour market requires specialists who can use and integrate the fields into a coherent whole.

The reflection of the results of the study courses in the course descriptions confirms that the study courses achieve all the knowledge, skills and competences required by the study programme. The information on the relevance of the outcomes of all study courses included in the study programme to the outcomes of the study programme can be found in the annexed course mapping.

The study courses are regularly updated, taking into account the recommendations of specialists in the field, employers, graduates and students, and their content corresponds to the requirements of the geography labour market for jobs in public institutions, the private sector, as well as research.

**Results of student, employer and alumni surveys are used to improve the quality of studies**

To ensure the quality of the study process, as well as to identify the needs of the students, the UL Department of Studies organises regular student and alumni surveys, which gather students' opinions and make suggestions both regarding individual study courses and the programme as a whole. Student surveys (electronic) are conducted twice a year (after the autumn and spring semesters), but students can express their opinions much more frequently during the study process by contacting the teaching staff, the study programme director, the head of the department and the dean of the faculty orally or in writing as needed.

**Student surveys**

The results of the surveys of the students of the Academic Master's study programme “Geography” about the study environment, study process, study results, as well as about the programme as a whole are collected from 2018 to 2021 (4 years) (see the Annex “Analysis of the results of the MSP “Geography” student, alumni and employer surveys”).

Regarding the study environment, respondents' scores range from 5.4 (somewhat agree) to 6.0 (mostly agree). The highest scores were given for “Responsive tutors and programme assistants”, “Material and technical facilities (rooms, computers and internet access) adequate for studies”, “Knowledgeable and supportive teaching staff” and “Resources offered by the University Library”. The lowest systematic rating is “Support from student council and self-government” (3-5.4). At the same time, the Student Council informs that it is difficult to involve Master students in any activities organised by the Student Council due to their workload.

The responsiveness and helpfulness of lecturers and study administrators are also highlighted in the comments, as are the modern classrooms. The 2020 survey points to the difficulty of grasping all the information related to distance learning.

The evaluation of the study process falls into the category of “rather agree” (5.1-5.7). The lowest rating across all years is for “The international study experience offered by the University was sufficient” (4.2 ± 1.6 to 5.8 ± 3.0). Note that there are large standard deviations, indicating a difference of opinion among students. The same can be seen in the comments, which point to the wide range of opportunities for ERASMUS+ studies and the lack of information about the same. The highest scores in this category are “Access to necessary information about the study process” (5.8±0.5 to 6.4±1.0) and “Opportunity to participate in the improvement of the quality of the study programme”, where in all cases the score is “rather agree”.

The 2021 comments mention the fact that some courses overlap slightly in terms of information, such as “Forest Landscapes and Management” and “Landscape Ecology: Theory and Practice”. It

should be noted that in the academic year 2021/2022 the topics of these courses were revised and some overlaps were eliminated. The reporting period 2017-2019 indicates insufficient use of the e-course (Moodle) environment. The average rating for learning outcomes falls into the “rather agree” category. Overall, the study outcome “I acquired good theoretical and practical knowledge during my studies” is rated the highest, with 6 (“mostly agree”). The lowest overall value for learning outcomes is “Study programme prepared for the labour market”, which ranges from 4.5±1.6 to 5.4±0.6 and corresponds to “neutral” to “strongly agree”. Comments indicate that students positively value the opportunity of applied studies to learn about labour market requirements and are interested in more guest lecturers in their courses.

When asked how perceptions of the study programme have changed/not changed, responses of “no change” or “improved” are typical, but the share of these responses varies from year to year. It should be noted that every year one student (except in 2019, where 0) answered that the opinion “has worsened”. A review of the comments does not allow to identify the reason for this rating.

Each semester, the results of the student survey are discussed at the Geography Programme Board meetings (now in the meetings of the Study Field Council). Students' proposals aimed at improving the Master's study programme in Geography are evaluated and, where possible, implemented in the study programme (e.g. the opportunity to participate in intensive international courses if there is no possibility to study ERASMUS+ at foreign universities). Information about the implementation of the courses and possible problems was regularly discussed with students during the semester and students are and were encouraged to solve questions or problems timely with the support of teaching staff, the administrative assistant and programme assistant. For example, if difficulties arise in combining study with work, teaching staff and students agree on an optimal study process with elements of individual course learning.

Regarding the motivation and support measures for students, scholarships are available to students in accordance with the procedures specified in the regulatory enactments of the University of Latvia, as well as the opportunity to apply for patronage scholarships. All students have an opportunity to use the help of a psychologist. The study-related issues are solved in cooperation with the study programme director, the dean of the FGES, as well as the teaching staff engaged in the delivery of specific study courses.

It is important to note that in the last two years, in relation to the learning process, there have been meetings of programme directors and dean with the Student Council, where programme directors are introduced to students' opinion on the learning process as collected through their own surveys. While the discussion mostly centred on undergraduate studies, a representative of 1$^{st}$ year Master’s students was also present at the October 2021 meeting.

**Graduates**

The survey of the graduates of the Master's study programme "Geography" was carried out in October 2021. It was anonymous and was created on the QuestionPro survey platform. The graduates of the Master's programme who graduated from the FGES in the period from 2016 to 2021 were addressed to participate in the survey. In total, answers from 46 graduates were collected.

Geographically, the largest representation of respondents, which was assessed according to their current place of residence, is from Riga (56%) and Vidzeme (25%). The 8% have indicated closest neighbourhood of Riga as their place of residence. Therefore, we can indirectly conclude that most graduates are employed in Riga, as well as in the Vidzeme region. The analysis of the survey results showed that 88.6% of respondents have been in paid employment in a field related to their study programme for at least 3 months and 79.5% are currently working full-time. At the time of the

survey, 73.2% responded positively to the question on the relevance of the job to the specialty studied at the FGES, while 26.8% said their current job was not related to the specialty studied. Most are employed in public institutions (68.3%) and in the private sector (26.8%). The overall assessment of quality of the study process is overwhelmingly positive, with 12.9% strongly agreeing and 74.4% rather agreeing. Only two respondents chose the answer “rather disagree”, but no reasons were given. The overwhelming majority of respondents (53.8% “strongly agree” and 33.3% “rather agree”) positively evaluated the opportunity to participate in improving the quality of the study programme during their studies, including the evaluation of courses and the work of the teaching staff, while 12.8% chose the answer “neutral”. When responding to the question whether the knowledge they gained during their studies prepared them for the labour market, 15.4% chose the option “strongly agree”, 48.7% “rather agree” and 33.3% were neutral. Only one of the 46 respondents indicated “strongly disagree”. Evaluating the answers of the respondents to the question about the impact of the study process on their own personality (sense of responsibility, time planning, views), promoting the development of the characteristics that were or are useful when entering the labour market, almost 80% (79.4%) answered “strongly agree” or “rather agree”. When responding to the question “Were the latest developments and achievements in the field discussed during the studies?” the answers were as follows: 12.8% “strongly agree”, 51.3% “rather agree”, 28.2% “neutral” and 7.7% or three respondents marked “rather disagree”.

In order to address the shortcomings identified by the graduates and to implement the recommendations, in the autumn of 2021 all study courses were updated by revising the course content and topics, updating the list of references and assessing the relevance of the course outcomes to the requirements of the Master's study programme in Geography.

In general, graduates rate very highly the acquired ability to apply theoretical knowledge of their field in practice, the ability to creatively solve problems of different complexity, the acquired ability to think critically (ability to evaluate, analyse, systematise information), as well as the acquired ability to analyse large amounts of information.

**Employers**

Employers generally rate the qualifications of graduates highly, praising their theoretical and practical training, their ability to acquire new knowledge and skills, and their ability to work independently. At the same time, employers point to opportunities for improvement. The assessment and recommendations are summarised in Table 20.

*Table 20*

*Evaluations and recommendations of employers about the study program*

| Name | Type of cooperation/ recommendations |
|---|---|

| | |
|---|---|
| Ministry of Environmental Protection and Regional Development | Recommendation: post information on university – student communication platforms about job vacancies. This would only be relevant for Master's students, as the majority of public administration employees are civil servants, for whom a university degree is a mandatory requirement. |
| Valsts zemes dienests (*State Land Service*) | On the positive side, there are applied studies during the course, which allow for more practical skills.<br>Encourage the recruitment of final year students to the State Land Service. |
| Latvian Geoinformatics Information Agency | The young people mostly have a good theoretical and practical knowledge base and good computer skills, can work independently after a short period of training, but some training continues for a long time. They are sociable and eager to learn, but few of them can come up with new ideas and solutions. More attention should be paid to the exact sciences – cartography, remote sensing, geodesy, geomatics, programming, mathematics, GIS, etc.<br>Collaboration could involve more actively recruiting recent graduates to work for the Agency and collaborating in research. |
| Central Statistical Bureau | A Cooperation Agreement has been signed between the University of Latvia and the Central Statistical Bureau, which also helps attract students to applied studies. |
| Latvijas Valsts Meži (*State Forests of Latvia*) | Recommendation: continue conducting joint research, provide internships, provide guest lecturers, participate and co-organize conferences. |
| Jāņa Sēta | Research collaboration - joint research projects in line with the company's R&D strategic orientations. |

| | |
|---|---|
| Envirotech | In general, as a company whose field of activity is closely related to the University of Latvia and especially the Faculty of Geography and Earth Sciences, we try to communicate and inform faculty members about the latest trends and developments in the field, invite them to events and are open to various models of cooperation. |

**Students benefit from inbound and outbound mobility opportunities, and the knowledge, skills and competences gained during mobility are recognised**

In the reporting period from the autumn semester of 2016/2017 to the autumn semester of 2021/2022, the number of Master's students studying in ERASMUS+ programmes at foreign universities was relatively low. On average, around 10% of all students, or 19 students, have taken advantage of this opportunity. In terms of foreign universities, there is no single dominant one – three students have taken the opportunity to study for a semester at the University of Ljubljana in Slovenia, and two at the University of Joensuu in Finland. These include Trier University in Germany, Charles University in Prague, the University of Szeged in Hungary and Vilnius University in Lithuania. The main reason for the last two years when no students went on ERASMUS+ exchange programmes is the circumstances of the COVID-19 pandemic. In general, a full-time job where it is not possible to take a break during one semester was mentioned as the main reason for not taking advantage of these opportunities.

In order to support and encourage students' involvement in mobility, credits gained (e.g. through ERASMUS+ exchanges, Summer Schools, or other intensive international courses) are counted towards Part B of the free elective if they are relevant to the programme content and have been agreed with the programme director. In order to activate the use of mobility programmes, closer cooperation with employers is also being developed, explaining to employers and students the positive benefits of using a mobility programme to develop students' knowledge, skills and competences.

At the same time, students of the Master's study programme "Geography" have actively used the opportunity to participate in intensive internationally organised courses or summer schools during this reporting period. For example, in the 2017/2018 academic year, two Master's students participated in the internationally organised interdisciplinary study course "Urban Challenge" summer school, which took place from 18 to 29 July in Copenhagen and from 1 to 12 August in Riga.

Two students participated in the NordPlus 2018 intensive course "From rural resource communities to renewable and recreational multi-localities", held at Vilnius University from 22 April to 5 May. In the 2018/2019 academic year, the NordPlus 2019 intensive course "Changing Colours for the Future? Reimagining Coastal Communities", which took place in Iceland from 19-31 May, three students had the opportunity to participate in a competitive process.

In cooperation with the Estonian University of Life Sciences and the professional Master's programme "Spatial Planning", two students of the Master's programme "Geography" also had an opportunity to improve their knowledge, skills and competences at the intensive course "Urban studies and planning" in Turku, Finland, in autumn 2019. Two students from the MSP "Geography" took part in the intensive course "Sustainable cities in the Nordic-Baltic Region", organised by the

Swedish-Finnish Cultural Centre.

To boost the use of mobility programmes, there is a need to work more closely with employers, explaining to employers and students the positive benefits of using a mobility programme to develop students' knowledge, skills and competences.

The teaching staff are actively involved in research, as evidenced by their academic and scientific qualifications, as well as their list of publications. They provide the basis for integrating the latest scientific developments into the course content. Course content is usually updated at least every two years in line with the latest scientific developments, and the course description is also updated if changes are significant. All MSP “Geography” course descriptions have been updated at the end of 2021 in preparation for the accreditation of the field of study. It should be noted that the study programme includes several courses (Environmental geomorphology, Introduction to geographic information technologies, ArcGIS Pro, cartography and spatial representations) that provide knowledge of other disciplines. This is in line with the trend of modern science to become increasingly interdisciplinary.

**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 award of the Master of Natural Sciences in Geography is based on the achievements and insights in the fields of Earth Science, Physical Geography and Environmental Science, as well as Social and Economic Geography, which are taught in the programme courses. The emphasis is placed on the sub-disciplines (Natural Geography, Regional and Environmental Geography, Applied Geography and Geomatics, Human Geography) in order to facilitate the acquisition of the theoretical foundations and methodology of problem solving, thus developing research skills and strengthening practical skills needed in the labour market.

The study programme is implemented mainly by lecturers with doctoral degrees in geography or geology. Two PhD students with Master's degrees in geography and geology are involved in the implementation of the study programme courses “Research Methods in Modern Geography Part II”, “ArcGIS Pro, Cartography and Spatial Representations”. The involvement of doctoral students' in the delivery of study courses is evaluated positively in terms of the accumulation of academic experience and, in many cases, the opportunity to reflect on new methodologies or theories used in their own doctoral theses. The teaching staff mainly carry out research in a subfield of geography. A small number of lecturers carry out research in geology or environmental science, which contributes to the interdisciplinarity of the study programme.

The degrees and research areas awarded are an indication of the faculty's capacity to provide students with study courses based on the latest advances and knowledge in the field, as well as of the fact that the Master of Natural Sciences degree in Geography is based on advances in 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.**

During the study courses and examinations, both oral, written and combined study and assessment methods are used.

The 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 (e.g. in courses such as “ArcGIS Pro, Cartography and Spatial Representations”, Dāvis Immurs from map publishing house SIA Jāņa Sēta, Dr.geogr. Aivars Tērauds from SIA Envirotech; in the study course Forest Landscapes and Management - Andis Ziemelis from VMD; in the study course “Territorial Systems and Regions”, Dāvis Kļaviņš from CSB). Practical assignments, seminars, individual, pair and group work, discussions and project development, study tours to industry organizations 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 organized as work experience visits, etc., e.g. Uldis Ainārs from CSB in the study course “Territorial Systems and Regions”; Andis Liepa from Ķemeri National Park in the study course “Global Change and Adaptation: Hydroclimatic and Biogeographical Processes; Jānis Ģērmanis from Rīgas Meži in the study course “Forest Landscapes and Management”; Līga Āboliņa from Ministry of Welfare in the study course “Geographical Mobility”).

In order 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 (e.g. in the study courses “Landscape Ecology: Theory and Practice”, “Natural Capital and Ecosystem Services” etc.). Senior year students are involved in peer teaching-learning. Seminars are organised in almost all courses to improve students' speaking, presentation and discussion skills.

To aid students in achieving learning outcomes – in acquiring and consolidating knowledge, skills and competence – the study process is dominated by student-centred methods. The study process is supported by methods that facilitate students' communication in the implementation of study tasks, solving real-world problems, modelling situations (e.g. in the study courses “Human-environment Interactions in Theory and Practice”; “Global Change and Adaptation: Hydroclimatic and Biogeographical processes”).

The physical environment of studies is also gradually changing: classrooms are easily transformable for group work, individual work, students can use digital technologies. The teaching staff mainly use methods that encourage students' active participation, critical thinking and reflection. The e-learning environment is used in the study process and to promote independent studies. Each study course has an e-learning environment (Moodle) where students have access to lesson materials, 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-learning environment.

The individual approach to each student is a key element in the implementation of the study programme, and this is manifested in several aspects. Firstly, students have an opportunity to consult individually with any member of the teaching staff at fixed consultation times. Second, the use of e-learning also enables collaboration between students and teaching staff. The teaching staff are obliged to regularly check and reply to emails they receive, and some members of teaching staff actively use various social networks (Facebook, Twitter, Instagram) to communicate with students. Thirdly, students have free access to the faculty's full-time staff, programme assistants and management.

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 teaching staff and students on the content of studies, forms and methods of organization. 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, teaching staff use methods, examination forms and assessment criteria that are appropriate to the study goal and planned learning outcomes.

Students receive support and feedback from the teaching staff during the study process. Grading criteria for marking are made public in advance. The assessment gives students an opportunity to demonstrate the extent to which they have achieved the expected learning outcomes.

Student mobility (e.g. participation in ERASMUS+ internships, Summer Schools and intensive international courses) is encouraged in line with the principles of student-centred education. The most frequent interest expressed by students in participating in these activities is related to the development of a research project, such as learning a new methodology. The credits obtained in this way are counted towards Part B of the free elective. Students participate in research initiated by the academic staff (for example, in the Fundamental and Applied Research Projects funded by the Latvian Council of Science, as well as in State Research Programs, LIFE + projects: prof. N. Stivriņš involved Master's students L. Trasūne and N. Jasiūnas, assoc. prof. S. Rūsiņa involved M. Ancāne, prof. Z. Krišjāne involved students M. Karjaka, E. Paslauska, R. Putniņš, A. Sudars, T. Skadiņš, A. Āboliņa, M. Feizaka, L. Chernovska, assoc. prof. M. Bērziņš - M. Špude) and social activities in society, thus gaining significant experience, using what has been learned 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. Students of the course “Introduction to Master Studies in Geography” are familiarised with the procedure for submitting proposals. The results of student surveys are evaluated and taken into account 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 director.

Since Spring 2020, the COVID-19 courses are delivered in a hybrid way - remotely via online emergency support, MS-Teams or Zoom, or face-to-face under all security conditions. These exceptional circumstances contributed to the intensive use of the Moodle environment not only for posting lecture material but also for testing knowledge. The development of courses is seen as an important development, allowing students to use distance learning methods and greater access to study materials and forms of assessment. The distance learning process, to which teaching staff and students in the Master's study programme in Geography of the FGES have adapted, is generally considered to be appropriate for the implementation of the study programme in exceptional circumstances. At the same time, the survey results indicate that for the development of a Master's thesis face-to-face consultations with a lecturer are more important than e-mails.

**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 order “Requirements for the development and defence of the final thesis (bachelor's, master's thesis, diploma thesis and qualification thesis) (UL 11.02.2020 Order No. 1/454) and in accordance with the FGES regulations “On the Procedure for the Development and Defense of the Final Thesis in Geography, Geology, Spatial Planning and Teachers' Professional Study Programs” (https://www.geo.lu.lv/studijas/studentiem/nosleguma-darbi/izstrade-un-aizstavesanas-kartiba/- information only in Latvian); approved March 19, 2018 FGES Council meeting). The Master's thesis is evaluated by the Master's Final Examination Board, taking into account the recommendation included in the reviewer's reference.

The choice of thesis topics is made on an individual basis in consultation with the faculty staff. Initially, the selection of the Master's topic related to research methods takes place at the end of the 2$^{nd}$ semester in the course “Research Methods in Modern Geography. Part II”, where students justify in their course paper the choice of the most appropriate data acquisition and analysis method for carrying out research tasks depending on the specifics of the topic. The choice of the Master's topic before the summer season is important because of the specificity of the fieldwork for the collection of empirical data. During the 3$^{rd}$ semester, students develop and defend a Master's thesis project, which aims at achieving the results of the Master's thesis. In the 4th semester, all students are given the opportunity to participate in a preliminary defence of their master's thesis, where, if necessary, the title of the topic is clarified and suggestions and instructions for the development of the topic are received. The procedure for submitting and defending a Master's thesis is described in the above-mentioned regulations of the UL and FGES.

The Master's thesis must meet the basic requirements of a scientific thesis:

- there must be scientific research in one of the sub-sectors of geography;

- the result should be based on data from field studies, relevant literature, other sources of information and personal research;

- the course of the research must be logical, sequential, the result generalizable and unambiguous;

- common terminology and standardized abbreviations must be used;

- the work must be written in such a way that the author's views can be easily distinguished from those of other authors;

- the presentation of the content must be precise, clear, logical, specific;

- the work must be written in the correct literary official language.

During the reporting period (2017-2021), a total of 46 Master's theses have been produced by the graduates of the programme in a wide variety of topics in the subfields of geography.

The themes of final theses in the field of applied geography and geomatics, which integrate modern research technologies and at the same time promote their development and use in other subdisciplines of geography, are gaining relevance among Master's students.

Examples of themes for final theses:

- Use of LiDAR data and multispectral satellite imagery for decoding wet forest mineral soils;

- Development of a Latvian land use and land use change matrix using geospatial information from forest resource monitoring;

- Methodological developments for the identification of waterlogged agricultural land from remote sensing data sources;

- Application of convolutional neural network for land cover classification in orthophoto;

- Analysis of vegetation dynamics using a normalised vegetation index;

- Methodological solutions for the use of time series of remote sensing data in the automatic classification of agricultural crops.

The relevance of geomorphology in the choice of thesis topics is determined by the interest in the evolution of subglacial palaeoenvironmental conditions, sedimentation and landform processes in the Pleistocene, as well as the use of marsh and lake sediments in the reconstruction of postglacial palaeoenvironmental conditions. Examples of the themes of the final theses:

- The shorelines of Lake Ancilus and the Littorina Sea in the vicinity of Ventspils Lagoon;

- Stability of the boreal vegetation zone in the Holocene, north-eastern Lapland, Finland;

- Reconstruction of modern and palaeoclimate using the coexistence probability assessment method;

- Palaeogeographical changes and evidence of human presence in the sediments of lakes Vilkmuiža and Talsi.

In the field of natural geography, students' biogeographical research on the distribution patterns and dynamics of flora and vegetation in Latvia, as well as the impact of land-use change on soil properties, formation processes and soil ecosystem services has expanded in recent years. Examples of the themes of the final theses:

- Species diversity of Latvian temperate wet natural grasslands and its assessment with indicator

species;

- Impact of wild boar digging on the conservation of dry natural grasslands in Northern Kurzeme;

- Species diversity of Latvian temperate wet natural grassland and its assessment with indicator species;

- Soil factors influence on land use structure in Gailīši and Īslīce municipalities;

- Use of hyperspectral data for identification of spruce (*Picea abies*) root-knots.

The Latvian climate in the context of global change is relevant in the choice of the topics of the theses, where climate research, research on the impact of climate change, as well as aspects related to climate policy play an important role. In the field of hydrology, the final theses are on seasonal and long-term changes in the hydrological and hydrochemical regimes of rivers and lakes and the factors influencing them, as well as calculations of nutrient runoff and hydrological modelling for sustainable water resources planning in Latvia. In recent years, students have also produced final theses on natural and anthropogenic air and surface water pollution. Examples of final thesis topics:

- Changes and nature of the climatic growing season in Latvia;

- Assessment of air temperature extremes and their impacts in Latvia;

- Changes in seasonality of river tourism in the Gauja and Amata rivers;

- Assessment of greenhouse gas emission factors of the Intergovernmental Panel on Climate Change guidelines in the example of degraded peatland reclamation;

- Thermal modelling and the role of green infrastructure in Riga city centre;

- Changes in the structure of air quality data due to the Covid-19 pandemic;

- Assessment of long-term changes in the morphometry and hydrological regime of Lake Ķīše;

- Influence of land use types on the ecological quality of lakes in the Gauja river basin district;

- Assessment of modelling capabilities of biogenic processes in overgrown stands.

In the final theses, a significant part of the research is on the interaction between nature and people, using a landscape reading approach and developing new methods in landscape research. Examples of the themes of the final theses:

- The landscape of the Alsunga wind park: domestication, subjective perception and place identity;

- Everyday jogging practices in the urban environment: the example of Pārdaugava;

- Tourist attractions and routes in Riga: experiences of foreign tourists;

- India as a destination for Latvian travellers: cultural and geographical aspects of tourism.

In the area of human geography, the final papers are dominated by studies of the mobility and settlement of Latvia's population, as well as an assessment of the inter- and intra-national geographical mobility of the labour force and the identification of Latvia's migration regions. A significant part of this is the research on the assessment of urban and rural settlement patterns. Some final theses are also devoted to the study of transport flows. Examples of the themes of the final theses:

- Gentrification features in the Agenskalns neighbourhood;

- Population ageing trends in Latvian municipalities;

- Population distribution and mobility patterns in the Riga agglomeration;

- Migration biographies in the study of youth mobility;

- Spatial differentiation of population in Riga neighbourhoods by language spoken at home;

- Ethnic features of socio-spatial differences in large cities of Latvia;

- The impact of teleworking on changes in population mobility;

- The Latvian emigrant community in Chicago: different expressions of identity;

- Labour commuting and public transport provision as assessed by passengers in Pārdaugava;

- Student migration and manifestations of studentification in Jelgava;

- Administrative-territorial reforms and their impact on the development of Limbaži, Salacgrīva and Aloja regions;

- Mono-industrial urban villages: a case study of Latvia;

- Socio-economic processes of peat resources exploitation in Latvia: the case of Laflora Ltd;

- Study and analysis of passenger flows in the public transport system using photogrammetry method.

In general, it can be concluded that the topics of the master's theses are relevant to the title and content of the study programme, as well as the results of the research conducted by students are topical in the field of geography. The results of the research and projects presented in the theses demonstrate that the degree candidates have an in-depth knowledge of one of the fields of geography, the ability to independently obtain, summarise and interpret the results of their work, which enables them to carry out research activities and develop a research project at a high professional level.

The topics and quality of the defended Master's theses indicate successful achievement of the learning outcomes. The assessments of the Master's theses (Fig. 8) show that students are able to demonstrate a high level of knowledge, skills and competence in accordance with the requirements set for the Master's thesis.

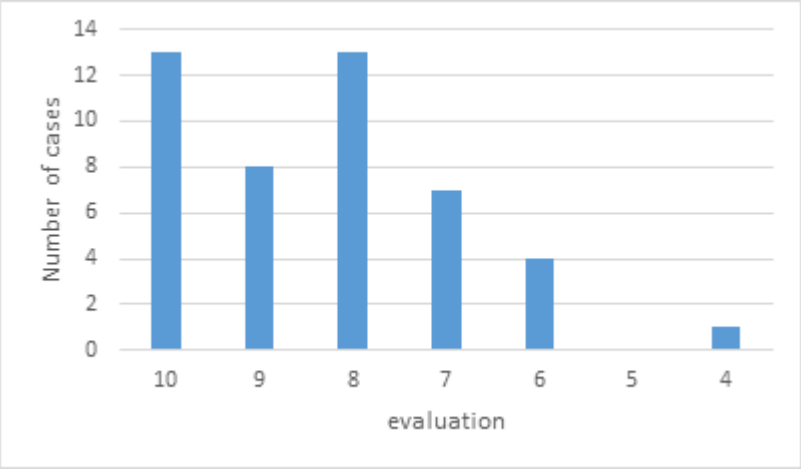



*Figure 8. Evaluations of the final theses of the Master's study programme "Geography" in 2017 - 2021*

Overall, the survey scores the final thesis above 5 (strongly agree), with higher scores (5.8-7.0) in

2020 and 2021. In all years, the responsiveness of the supervisor is emphasised. At the same time, the 2020 comments mention that one of the biggest obstacles in the development of the paper was communication via e-mails, which cannot replace face-to-face discussions. On the other hand, this communication mode is said to have developed more academic thinking skills.

## 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 “Geography” is fully provided with the information base for study courses and Master's thesis development, which is determined by the location of the Natural Sciences Library in the premises of the House of Nature Center, the location of the Science House Library in the adjacent House of Science, as well as access to a wide range of publication databases offered by the University of Latvia: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/

For all study programme courses, e-learning courses have been created in the Moodle environment, where study materials are posted, and news exchanged between students and teaching staff, mid-term examinations and exams are provided for some courses, as well as mid-term grades are entered and the final course grade is calculated.

The University of Latvia Academic Center for Natural Sciences offers students the opportunity to study in modern classrooms with interactive whiteboards and learn practical skills in spacious, well-equipped laboratories.

Provision of the resources of the study programme and its compliance with the implementation of the programme is given in Part 2, Chapter 3, Sections 2.3.1 to 2.3.3. In addition to the information provided in Chapter 3, the existing subsection provides more detailed information on the spatial data collection in the Map Browser of the University of Latvia.

The collection of spatial data in the Map Browser of the University of Latvia is being expanded year by year. It provides topographic maps, thematic maps, orthophoto map collections of the 6$^{th}$ cycle covering the territory of Latvia and a relief model of Latvia covering all the basic data in its structure. The Map Browser provides a 1:10 000 scale partial topographic map of the Latvian Geospatial Information Agency (LGIA). A LiDAR data model is available for about 60% of the territory of the Republic of Latvia, allowing the measurement of land surface (terrain) heights and the creation of profiles (research oriented).

The only Latvian (FGES) Map Browser contains Latvian agricultural land (cadastre) – soil maps and land valuation maps. The vector data of these agricultural lands prepared within the framework of the FGES project are available in e-Latvia and can be accessed by everyone. In the academic year 2020/2021 the Map Browser has been updated with new layers, maps of Riga City, 1883, in scale 1:2100, maps of Western Russia, in scale 1 : 100 000 - 1, 1915-1920, including Vidzeme, maps from

before World War I and maps of collective farms and Soviet farms in the USSR were obtained. The browser available to users registered in the UL network.

**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 Master's study programme "Geography", the University of Latvia uses:

- a state budget grant from the Ministry of Education and Science, which in the academic year 2021/2022 is set at EUR 1630 for full-time studies. The sector coefficient is 1.9 and the level coefficient is 1.5, resulting in a state budget subsidy of € 4646 per student;
- tuition fee, taking into account all the factors referred to in the section "Financial support", which in the academic year 2021/2022 is set as follows:
- 2000 EUR per year for full-time studies;
- 2000 EUR for full-time international students.

Taking into account the above, the total budget of the study programme is expected to be 153 thousand 312 EUR, per year, the data are shown in Table 21.

*Table 21*

*Estimated annual income of the programme, EUR*

| Type of study | Number of students | Tuition fee/state grant | Total income |
|---|---|---|---|
| FTS (budget) | 33 | 4646 | 153 312 |
| FTS (fee) | 0 | 2000 | 0 |
| International students | 0 | 2000 | 0 |

| | | | |
|---|---|---|---|
| **Total** | **33** | | **153 312** |

**Programme costs**

In order to estimate the amount of funds required for financial provision, the cost of study programmes at the University of Latvia is calculated according to the methodology developed by the University of Latvia, which takes into account the costs of providing the study process and information on the study programme plan, reliability of forecasts.

The full-time study programme costs

For calculations, the implementers of the MSP “Geography” use students data of the academic year 2020/2021 – 33 students study in the programme at the FTS, the existing study programme plan after accreditation and the existing structure of the involved academic staff. Taking into account the above, the estimated full-time cost per full-time student of the programme is 4640 EUR per year, and the total cost of the programme is 153 198 EUR per year. A more detailed percentage cost breakdown is shown in Table 22.

*Table 22*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 45.3% |
| General staff | 17.6% |
| Other payments | 0.0% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |
| **TOTAL COST** | **100.0%** |

Figure 9 shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

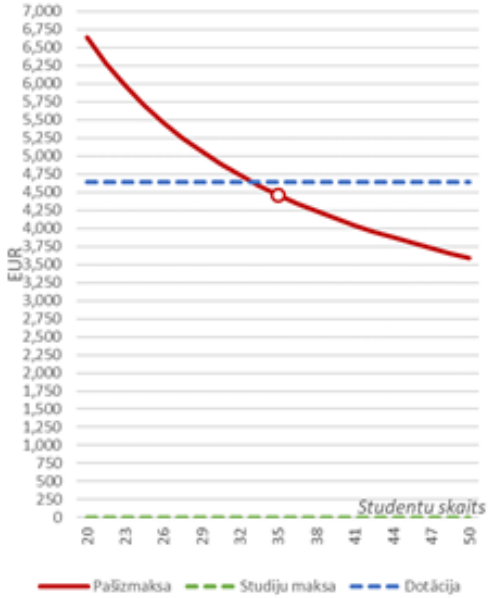



*Figure 9. Cost per student enrolled for the MSP "Geography"*

Based on the calculation, it can be seen that for the programme to be profitable and provide students with a quality study process, the number of fee-paying students in the programme (all courses combined) must be at least 50 (intersection of red (cost) and green (tuition) lines projected on the x-axis). On the other hand, if there were only budget students in the program, then their number should reach 33 students.

**Summary of the revenue and expenditure of the programme**

Table 23 summarizes the programme revenue based on the number of students, state grants and tuition fees, and the programme expenses for such number of students.

*Table 23*

*The result of the programme*

| Type of study | Number of students | Tuition fees/state subsidy | Total income | Total cost |
|---|---|---|---|---|
| FTS (budget) | 33 | 4646 | 153 312 | 153 198 |
| FTS (fee) | 0 | 2000 | 0 | 0 |
| International students | 0 | 2000 | 0 | 0 |
| Total | 33 | | 153 312 | 153 198 |

The data presented in the table clearly show that the University of Latvia has sufficient resources to implement the study programme and ensure its further development. In addition, the development of the programme can be financed from the revenues 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 the development of programmes from the UL Study Quality Improvement Fund.

The minimum number of students required for the study program does not depend on its implementation in English or Latvian, as the instructors and study courses do not differ.

## 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.**

In the academic year 2020/2021, 29 lecturers from the Departments of Geography, Geology and Environmental Science, from the Regional Geographical Research Institute Leipzig (Germany), from the University of Bari (Italy), from the University of Klaipeda (Lithuania) participated in the implementation of the Master's study programme. Four professors, nine associate professors, one visiting professor, two visiting assistant professors, three guest lecturers, seven assistant professors and three senior researchers in total. It should be noted that several staff members jointly teach one course. Thus, the number of professors and associate professors (10) is in full compliance with Article 55(1)(3) of the Law on Higher Education Institutions, which stipulates that "not less than five professors and associate professors who have been elected to academic positions at the respective higher education institution shall participate in the implementation of the compulsory part and the restricted optional part of academic study programmes".

During the reporting period, the academic staff has been involved in significant international projects, projects funded by the Latvian Council of Science, as well as applied research commissioned by state institutions and commercial enterprises, which corresponds to the content of the study programme and thus the obtained results are successfully used to improve the study process (see Section 2.4).

The high qualifications of the teaching staff also enable them to meet the National Academic Education Standard (Part III, paragraphs 15 and 16):

- The main goal of the Master's study programme is to provide a set of knowledge, skills and competences in accordance with the knowledge, skills and competences of level 7 of the Latvian Framework of Educational Classification.

- The content of the Master's study programme ensures the achievement of study outcomes that include the acquisition of in-depth theoretical knowledge and the development of research skills and competences in the chosen field of science or art.

The qualifications of the teaching staff contribute to the learning outcomes of the Master's study programme "Geography", as they are dominated by highly qualified teaching staff – professors and associate professors. In addition, the faculty is specialised in different sub-fields of geography (natural geography, environmental and regional geography, human geography, applied geography and geomatics) as well as other fields of science (geology and environmental science), which

makes it possible to provide students with the latest scientific knowledge and up-to-date practical skills across a broad spectrum of the natural sciences. It is important that among the researchers, senior researchers and lecturers there are a number of young faculty members who may in the future form a succession of professors and associate professors. From 2018/2019 Academic Year the content of the study programme is significantly improved by the participation of guest lecturers Dr. Guido Sechi, Dr. E.Spiriajevas and guest professor Prof. Thilo Lang, thanks to the support of the project “Academic Renewal and Competence Development of the University of Latvia”.

### 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, there has been a significant increase in the qualifications and composition of the teaching staff, as shown in Table 24. Normunds Stivriņš, who is active in the field of post-glacial palaeoenvironmental research, has been elected to the position of professor. Four member of teaching staff have been elected as associate professors: Solvita Rūsiņa, Anita Zariņa, Māris Bērziņš and Kristaps Lamsters. All of them are recognised experts in their fields, as evidenced by their high-quality publications, participation in projects, and their expertise in Earth Science, Physical Geography and Environmental Science, or in Social and Economic Geography. During the reporting period, the experienced prof. Vitalijs Zelčs retired, so Kristaps Lamsters has taken over the course of the geomorphology study course. Doctoral degrees have been awarded to two lecturers of the programme, Olga Sozinova and Ivo Vinogradov, who are currently actively involved in teaching of a new course of study and researching. Elīna Apsīte-Beriņa, who has been appointed an assistant professor, also participates in the implementation of the programme. For the academic year 2021/2022, 2 lecturers from the employers' side have been engaged for GIS technology training: Dr.geogr. Aivars Tērauds from Envirotech Ltd and PhD student Dāvis V. Immurs from Karšu izdevniecība Jāņa seta Ltd.

*Table 24.*

*Changes in the number of teaching staff (%)* in 2016 and 2021 in the Master's study programme "Geography"*

| Academic position / Year | 2016 | 2021 |
|---|---|---|
| Professors | 36 | 31 |
| Associated professors | 45 | 23 |
| Assistant professors | 9 | 32 |
| Leading researchers, researchers and lecturers | 10 | 14 |

* Calculated according to the representation of the academic staff in the implementation of each study course

Overall, it can be concluded that the changes in the number and structure of the academic staff involved in the programme are positive and that the quality of education is being enhanced, as the

academic staff involved in the programme qualitatively and quantitatively ensure the achievement of the objectives 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).**

In order to promote the improvement and interconnection of study courses, there is a regular co-operation between the teaching staff. This is also facilitated by the fact that in many cases several lecturers teach one course together. At the meetings of the Study Programme Board and, since May 2020, at the meetings of the Study Field Council, proposals for improving the study process are discussed and considered, taking into account the students' evaluation of the study course.

The programme management also facilitates the cooperation of the teaching staff by regularly meeting and/or communicating electronically with the lecturers to discuss and coordinate the study process. Study issues are discussed in individual conversations and periodically reviewed by the Study Field Council.

If students' suggestions are made in discussion with the programme director or head of department and concern the teaching of a particular course, the lecturer of that course is informed at the

beginning and the students' comments are evaluated and solutions are sought to improve the course.

Regular meetings of the Study Field Council are convened to discuss issues related to study and methodological work (improvement of course content, e-learning environment, etc.). If one study course is taught by several lecturers, one of them is responsible for updating the content in LUIS, as well as for coordinating the topics and time allocations according to the course description and other topical issues.

In the academic year 2020/2021, 29 lecturers were involved in the implementation of the Master's study programme "Geography", which represents a student-teaching staff ratio of 1.27 students per one lecturer.

# 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 | Sample of diploma and its supplements to be issued for the acquisition of the study programme Appendix 28.docx | Par studiju programmas apgūšanu izsniedzamā diploma un tā pielikumu paraugs 28.pielikums.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) | Council of Higher Education Opinion Brief Appendix 29.docx | Augstakas izglitibas padomes atzinums_29 pielikums.docx |
| 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 | Statistics on students enrolled in the Master's study programme Geography Appendix 30.docx | Statistikas dati par studējošajiem maģistra studiju programmā "Ģeogrāfija" 30.pielikums.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 | Compliance of the Master's study programme Geography with the State Education Standard_Appendix 31.docx | Maģistra studiju programmas Ģeogrāfija atbilstība valsts izglītības standartam 31.pielikums.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 | Mapping of the study courses of the Master's study program Geography Appendix 32.docx | Maģistra studiju programmas "Ģeogrāfija" studiju kursu kartējums 32.pielikums.docx |
| The curriculum of the study programme (for each type and form of the implementation of the study programme) | Study plan for academic Master's programme Geography- Appendix 33.docx | Ģeogrāfijas magistra programma_ studiju plans 33.pielikums.docx |
| Descriptions of the study courses/ modules | Description of the study courses of the academic Master's programme Geography_Appendix 34.pdf | Akadēmiskās maģistra studiju programmas "Ģeogrāfija" studiju kursu apraksti-34.pielikums.pdf |
| 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) | Certification that academic staff of the academic Master study programme Geography complies with the requirements laid down in Section 55 Appendix 11.docx | Apliecinajums par atbilstibu Augstskolu likuma 55. panta pirmas daļas 3 punkta prasibam-11 pielikums.docx |

# Geology (43442)

| | |
|---|---|
| Study field | *Geography and Earth Sciences* |
| ProcedureStudyProgram.Name | *Geology* |
| Education classification code | *43442* |
| Type of the study programme | *Academic bachelor study programme* |
| Name of the study programme director | *Māris* |
| Surname of the study programme director | *Krievāns* |
| E-mail of the study programme director | *maris.krievans@lu.lv* |
| Title of the study programme director | *Asociētais profesors, Dr. geol.* |
| Phone of the study programme director | *+371 26183313* |
| Goal of the study programme | *To provide students with opportunities to acquire a systematic knowledge of the fundamentals of geology and related natural sciences, to acquire initial specialisation in bed-rock geology, applied geology and Quaternary geology and geomorphology, to develop erudition and practical skills to meet the requirements of the labour market and to continue their studies at master's level.* |
| Tasks of the study programme | *1) to provide students with opportunities to acquire theoretical knowledge in geology and related natural and earth sciences, and to develop the skills to apply this knowledge in the field of geology;*<br>*2) to provide opportunities to develop skills in research and practical work that will ensure competitiveness in the labour market;*<br>*3) to develop critical thinking skills;*<br>*4) to facilitate the acquisition of skills in the discovery and solution of problems typical of the field of geology.* |

| | |
|---|---|
| Results of the study programme | *KNOWLEDGE*<br>*1. Understand the diversity and applied nature of geological research, the diversity of Latvia's mineral resources, their importance in the national economy.*<br>*2. Know and can demonstrate a critical understanding of the structure of soils, deposits and sedimentary strata of different ages, rock types, mineral composition, geological age, formation conditions, location of sedimentation basins and catchment areas, the world of organisms and its development.*<br>*3. Understand the possibilities of using GIS, CAD, cartography, remote sensing and geophysics in geology in connection with data collection, spatial analysis and visualization, methods and their application.*<br>*SKILLS*<br>*4. Demonstrate basic ability to combine theoretical knowledge and practical activities to solve geological problems.*<br>*5. Perform independent observations of soils, sediments, deposits, rock composition, structure, remains of organisms, geological structure and modern geological processes.*<br>*6. Use modern information sources, databases and evaluates the most important legal acts, norms and other requirements for the implementation of geological research in Latvia.*<br>*COMPETENCE*<br>*7. Evaluate the distribution of the most important minerals and the useful properties of the Earth in the geological section of Latvia, as well as comprehensively analyse the territory from the point of view of available natural and environmental resources.*<br>*8. Choose the necessary methods for geological research and solve the problems in the fields of palaeontology, stratigraphy, regional geology, applied geology and Quaternary geology.*<br>*9. Analyse the Earth's materials and properties using field and laboratory methods, as well as describe the activities performed, document, process and interpret the results obtained and report on them.*<br>*10. Demonstrate improved skills in oral communication in Latvian and a foreign language, critical thinking, skills in formulating working hypotheses and presenting evidence, independent work skills.* |
| Final examination upon the completion of the study programme | *Bachelor 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 of Natural Sciences in Geology* |
| 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 - 3 years - english**

| | |
|---|---|
| Study type and form | *Full time studies* |
| Duration in full years | *3* |
| Duration in month | *0* |
| Language | *english* |
| Amount (CP) | *120* |
| Admission requirements (in English) | *Previous education: secondary education. Studies in English require English language skills in accordance with the applicable laws and regulations (for foreigners - English language skills at least at B2 level.* |
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Bachelor of Natural Sciences in Geology* |
| 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.**

In the reporting period, minor changes were introduced to the Bachelor's study programme "Geology" in order to improve the quality of the programme and to bring it in line with changes in the regulatory enactments, including changes in the formulation of study outcomes, taking into account the new requirements and the distribution of knowledge, skills and competences. During the reporting period, a new Director of the study programme, assoc. prof. Māris Krievāns was approved; the previous study programme director, assoc. prof. Ģirts Stinkulis was confirmed as the Director of the Master's study programme "Geology".

Learning outcomes were consolidated in cooperation with employers. Study results were structured as knowledge, skills and competence, and are also divided into 10 subsections.

**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 is fully in line with the field of study "Geography and Earth Sciences", as geology is one of the Earth sciences and one of the natural sciences. Upon graduation from the academic bachelor's study programme "Geology" (hereinafter referred to as BSP "Geology"), graduates obtain a bachelor's degree of natural sciences in geology, which corresponds to an internationally recognised field of science and is relevant to the field of study. The goal, objectives and learning outcomes of the study programme are also in line with the Bachelor's level studies in geology, as they enable the acquisition of knowledge, skills and competences in geology and directly correspond to the field of study and the title of the study programme. The first two digits of the programme code (43442) indicate the level of study – academic education (Bachelor's degree), while the third to fifth digits (442) correspond to the field of study – Geography and Earth Sciences. The programme code is therefore correctly designed and matches the other programme parameters.

The content of the BSP Geology is designed to provide students with the fundamentals of the entire field of geology, its sub-disciplines and fields. In addition, other basic science subjects and foreign languages are taught. Current knowledge in geology and its fields, as well as in other natural sciences, is taught in specific courses and is reflected in course descriptions, e-learning courses and

study literature offered to students.

The BSP "Geology" and its content are also in line with the guidelines of the strategic management documents of the University. The implementation of geology studies at the University of Latvia is optimal due to the fact that the UL offers a wide complex of natural science studies and opportunities to integrate courses from related fields into study programmes. The BSP Geology includes a University core module, covering courses in foreign languages, biology, chemistry and physics specifically designed for students of Earth sciences.

The study programme is implemented over 3 years. This is an optimal span considering that students obtain a bachelor's degree in a relatively short time and can work as well-qualified professionals. However, as previous experience has also shown, until 2007, the 4-year format of the Bachelor's study programme resulted in a higher level of knowledge among graduates. Balancing the level of graduates' knowledge and practical skills, their desire to enter the labour market as quickly as possible, and the duration of their studies, the current study duration is optimal.

The content of the study programme is designed to achieve the set aim in accordance with the set tasks and is appropriate for the Bachelor's degree in natural sciences to be obtained in accordance with the State Academic Education Standard (Cabinet of Ministers Regulation of 13 May 2014 No 240 “Regulations on the State Academic Education Standard”). The admission requirements of the study programme take into account mathematics and English language skills, which help students to achieve their learning outcomes better and acquire knowledge, skills and competencies related to the field of geology and research.

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

The bachelor's study programme “Geology” offered by the University of Latvia is the only programme for the training of bachelor’s level geology specialists in Latvia. The programme provides specialists with a bachelor's degree for the labour market in state and municipal institutions and private companies in the fields of engineering geology, hydrogeology, mineral prospecting and exploration, geophysics for both Latvian and foreign conditions. The programme trains specialists in the growing field of scientific research in geology, which is supported by the science base and performance funding, the funding of the LCS, other research grants provided by Latvia and the European Union, as well as contractual work at the UL and other research organisations.

The job market in geology has expanded during the reporting period. This is largely due to mineral exploration for building and road construction materials, as well as engineering geological studies, which are closely associated with the increase in construction and road building activities. It should be noted that the *Rail Baltica* project, a new railway infrastructure, has created a particularly strong demand for geoscientists. In addition, there has been a strong demand, even economically, for well drilling and related groundwater studies. There is a relatively high and stable demand for qualified geoscientists in the above areas. This is reflected both in the information provided by geology bachelor’s and master’s students and in the regular interest of employers in recruiting new staff. It should be noted that the labour market demand for geology students and graduates is higher than the actual number of students and graduates.

Several geology graduates have become employers themselves. They both recruit young

professionals and, at the same time, make reasonable demands on the knowledge and skills acquired in the basic studies of Earth sciences.

The 23 respondents took part in the alumni survey organised in October 2021. When analysing their employment, it can be concluded that the vast majority of respondents (95.7%) work in Latvia. The majority of respondents (72%) work in geology or a related field. The 49%  of all respondents work for private geological companies, 29% for public institutions in geology or a related field (geography, environmental science, geodesy, etc.), 25% work for other institutions and fields, and no respondents are unemployed. The 44% are continuing their studies or participating in research at the UL or other universities, while 56% are not studying or participating in research. An analysis of graduates' employment shows that by far the majority of graduates of the Bachelor's study programme "Geology" are employed in their chosen or related specialisation.

It is important to note that studies and research in geology are in line with the priority directions of Latvian science (Cabinet of Ministers Order No 551, "On Priority Directions in Science in 2014-2017" as of 20.11.2013 and Cabinet of Ministers Order No 746, "On Priority Directions in Science for 2018-2021" as of 13.12.2017), in particular in the fields of local natural resources (mineral deposits), including energy resources, and climate change research.

The economic and social rationale for implementing the programme in English is as follows:

1) it offers opportunities for those who want to study in the Baltic countries and those living outside them to understand the specifics of the geological structure of Latvia and similar territories theoretically and practically, which is difficult to do in regions with a different type of geological structure.

2) It provides opportunities for further studies in the field of geology in European Union countries;

2) It allows interested from other countries to study the traditionally strong geological sub-disciplines in Latvia: glacial geology, geomorphology, palaeontology, etc.;

4) the competence of the teaching staff improves, and the quality of study materials improves.

### 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.

All students in the Bachelor's study programme "Geology" have studied in Latvian, except for exchange students, for whom lectures, practical, laboratory, field work and individual consultations have been conducted in English. The data show that the number of matriculated students has slightly decreased in the last six years, as has the number of graduates, especially in 2021. There are several reasons for the decline in the number of matriculated students. It is due to the demographic decline characteristic of Latvia and, as discussions with students who drop out show, due to the financial situation in their families. Between 2016 and 2021, the total number of students has stabilised (except for a drop in 2019). The number of students in years 1-3 is reasonable, roughly similar. Promotional activities have been carried out in schools, on the internet and in the media to increase the overall number of students. The number of exmatriculated students has decreased in recent years, but the number of graduates has also fallen. According to the students themselves, this is due to too many general orientation courses in the first year of

study (geology is not specifically covered), problems combining face-to-face study with work, and the desire of some to continue studying something else. In order to reduce the negative impact of the predominance of less geology-related courses, a new study course "Geological Field Techniques" has been created and is being implemented already in the first semester. Several measures were taken to address all the problems: discussions with teaching staff of general science courses on ways to reduce student attrition; involvement of new lecturers in teaching first year courses to make the courses more interesting; and the introduction of new lecturers in the 2016/2017 academic year. In 2016-17, the institution of a 1st year trustee has been established for each study programme at the UL. The trustee regularly meets with students, helps them to settle into the study environment, and acts as a mediator between them and the faculty management. It should be noted that every year for the last five years at least one student has transferred to study geology from another study programme.

The number of students graduating in the reporting period is approximately twice lower than the number of students currently enrolled in each course, indicating the likelihood of a higher graduation rate in the coming years. It should be noted that the low graduation rate in 2020-2021 is due to the SARS-CoV-2 pandemic and the distance learning process. Students have indicated that it is difficult to concentrate on their studies during this period, thus the number of students who have gone on academic leave has increased.

From the academic year 2015/2016 to 2021/2022, the residence of foreign students has been mainly the University of Oviedo in Spain (a long-term cooperation partner of the Department of Geology of the FGES), as well as the University of Münster in Germany. During the same period, the students of the Master's study programme “Geology” of the University of Latvia (FGES) have studied at such foreign universities as the University of Ljubljana (Slovenia), Charles University in Prague (Czech Republic), University of Oviedo (Spain) and Aarhus University (Denmark).

**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.**

Since the academic year 2009/2010 the study programme is fully compliant with the Lisbon Convention (1997), the Bologna Declaration (1999) and other international documents regulating higher education. The duration of studies is 3 years (6 semesters). At the end of the studies, a bachelor's thesis is prepared, which is an original research in one of the subfields of geological science.

The volume of the BSP “Geology” is 120 credit points (CP). The programme consists of mandatory (A) part courses (74 CP in total, including a bachelor's thesis in the amount of 10 CP), restricted electives (B) part courses (42 CP in total) and free electives (C) part courses (4 CP in total). The mandatory courses cover the basics of natural and Earth sciences, as well as the core areas of geology, field courses, course paper, the bachelor thesis project and the bachelor thesis. The restricted elective courses provides opportunities for initial specialisation in three sub-fields of geology: applied geology, bedrock geology or Quaternary geology and geomorphology, as well as theoretical knowledge and practical skills in the related disciplines. The programme includes separate courses in biology, chemistry, physics, geography and environmental science, giving students an insight not only into geology, but into the broader natural sciences.

The aims, objectives and planned learning outcomes of the study courses are designed to enable students to progressively develop and deepen their knowledge of the natural sciences and Earth sciences: starting with the core module and the geology core module, and continuing with the restricted elective courses grouped into three modules: the bedrock and Quaternary geology module (14 CP), the applied geology module (22 CP) and the natural geography module (6 CP). Each student thus acquires the necessary knowledge and practical skills in the fundamentals of natural sciences and geology, and chooses courses within the modules to gain an initial specialisation in an area of geology.

The BSP “Geology” is integrated with other study programmes of the University, including the most significant integration with the bachelor’s study programmes “Geography” and “Environmental Science”. Many of the restricted electives and some of the mandatory courses are taught by academic staff from the Department of Geography and the Department of Environmental Science. Some of these courses are included in two or even all three of the undergraduate programmes offered by the FGES. These include Earth Sciences, Data Analysis in Environmental and Geosciences, Geodesy, Geomorphology, Assessment and Management of Resources, Soil Science, Hydrology and Climatology with Basics of Meteorology.

In the light of student surveys and comments, the proportion of English is gradually being increased in several courses, such as “Sedimentary Processes and Deposits”, “Palaeontology and Stratigraphy”, “Mineral Resources Geology”, etc. During the reporting period, the e-learning environment materials of all BSP "Geology" study courses were significantly improved, except for "Course Thesis of Geology" and "Bachelor Thesis", where the materials and methodologies used are not universal and are recommended by the supervisors of the specific work. The teaching staff of several study courses, such as “Introduction in Bachelor Studies in Geology”, “Hydrogeology” and “Engineering Geology”, actively cooperate with geological companies to provide the skills and knowledge needed in the labour market, and practical work within the study courses is carried out according to the standards used in the industry. The content of the course is thus tailored to the requirements of the labour market. The teaching staff consult regularly on the content of courses to minimise overlaps. In the academic year 2017/2018, the overlap between the study courses " Introduction in Bachelor Studies in Geology " and "Geology of Latvia", as well as between the above-mentioned course and " Mineral Resources Geology" has been significantly reduced. However, the necessary links between these study courses have been maintained. The elective courses are limited by the relatively small number of students in the BSP “Geology” and the funding available, but geology students have ample opportunities to take courses in related fields such as

geography, environmental science, biology, etc. In Part C of the programme, students choose free electives in the amount of 4 CP.

The content of the programme meets the requirements of the geology labour market in the applied field, in state and local government institutions, and in research. The aims, tasks and learning outcomes of the study courses correspond to the goal of the study programme “to provide students with opportunities to acquire systematic knowledge of geology and related natural sciences, to acquire initial specialization in bedrock geology, applied geology and Quaternary geology, to develop erudition and practical skills and continuation of Master's studies”, as well as objectives and learning outcomes of the programme.

**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.**

The content of the study programme and its courses is based on modern concepts from various scientific disciplines. The specifics of the BSP Geology courses and the year of study determine the study methods used to acquire the course material. In the first year of study, practical and laboratory work plays an important role alongside lectures as the most widely used form of study in courses such as "Earth Sciences", "Chemistry for Environmental and Earth Sciences", "Earth Physics ", "Minerals and Rocks" and "Sedimentation Processes and Deposits". Laboratory and practical work are the most important form of study in the courses "Geological Field Techniques" and "Laboratory Testing Methods in Geology". Practical and laboratory work is also widely offered in the second and third years of study.

During the study courses and examinations, both oral, written and combined study and assessment methods are used. The studies employ a variety of knowledge acquisition and consolidation methods, such as introductory lectures, interactive lectures, consolidating lectures, and problem-oriented lectures. Practitioners, mainly professionals from different geological companies, are invited to teach individual lectures in study courses to promote the unity of theory and practice (e.g. in courses such as Introduction in Bachelor Studies in Geology, Engineering Geology). Practical assignments, seminars, individual and group work, discussions, study tours to industry organizations (e.g. JSC “Latvijas Gāze” Inčukalns gas storage facility, quarries of various mining

companies) are widely used.

To foster the development of students' research competence, students have an opportunity to carry out individual study work in preparation for seminars, as well as in planning, organising and developing their study paper in geology, bachelor's thesis project and bachelor's thesis. At the same time, students' public speaking, presentation and discussion skills are promoted in seminars and independent research projects.

Field courses are an important part of the study of geology. The field course in Earth Sciences is implemented in Latvia, at the Lodesmuiža field station, as well as in Estonia (geological routes in a wide part of the country, including Saaremaa Island). The field course in regional geology, depending on available funding and student interest, is implemented either in Poland, in the Holy Cross Mountains, or in Latvia, as geological itineraries in Vidzeme. Field courses are also organised in the framework of the courses "Quaternary Geology and Geomorphology", "Geodesy", "Soil Science", "Hydrology" and "Climatology and Basics of Meteorology".

The physical environment of studies is also gradually changing: classrooms are easily transformable for group work, individual work, students can use digital technologies. Teaching staff mainly use methods that encourage students' active participation, critical thinking and reflection. The e-learning environment is used in the study process and to promote independent studies. Each study course has an e-learning environment (Moodle) where students have access to lesson materials, 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-learning environment.

The study methods for implementing the study programme in English are analogous to its implementation in Latvian.

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 teaching staff and students on the content of studies, forms and methods of organization. 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, teaching staff use methods, examination forms and assessment criteria that are appropriate to the study goal and planned learning outcomes.

Students receive support and feedback from the teaching staff during the study process. Grading criteria for marking are made public in advance. The assessment gives students an opportunity to demonstrate the extent to which they have achieved the planned learning outcomes.

In addition to these varied geological studies, the modern research methods available to UL students allow them to develop their talents in IT, drawing, mathematics, physics, chemistry, biology and more. They can develop their independent work skills during the acquisition of study courses and during the development of their bachelor's thesis. The fields of study and independent research are in line with the major developments in geology, ranging from basic research in fundamental science to various areas of applied research.

Student mobility and the recognition of academic results are promoted, in line with the principles of student-centred education. Students participate in research initiated by the academic staff (in the project lzp-2020/2-0060 “Establishment of a reference network for pollen and other microscopic residues for the territory of Latvia – a fundamental basis for reconstruction, modelling of climate, landscape, vegetation and water quality”; lzp-2019 / 1-0165 “Spatial prediction of groundwater drought with mixed models in a multi-layer sedimentation basin under the influence of climate

change” and other) and social activities in society, thus gaining significant experience by applying what has been learned 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. Students of the course “Introduction in Bachelor Studies in Geology” are familiarised with the procedure for submitting proposals, as well as in consultations with the trustee and the programme director. The results of student surveys are evaluated and taken into account 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 director.

In order to provide students with at least partial training in field research skills, the Field Course in Earth Sciences and the Field Course in the Regional Geology in 2020 and 2021 implemented an approach whereby lecturers conduct geological itineraries where the coordinates of research points are recorded with a GPS device. These points are used to develop specific tasks for students, take photos and make videos. The trainers developed field course guides, which were accompanied by these videos, coordinates and maps of the points. The students received these materials in the e-learning environment and could use them in their individual field studies, following the same geological routes and completing specific tasks at specific points along the way, using descriptions and video instructions provided by the lecturers. After completing the assignments, students prepared individual field study reports and submitted them for assessment in the e-learning environment. In several courses, students were offered specific tasks that they were able to carry out in their chosen area in the field. For example, in the course "Sedimentation processes and deposits", students described and interpreted the landforms of sandy sediment beds in the field and sent the photos and reports to the teaching staff for evaluation.

For the students of the University of Latvia who use the opportunity to study or undergo internship within the framework of various international exchange programmes, the recognition and assimilation of learning outcomes acquired during mobility is carried out in accordance with the above-mentioned regulations regulating recognition at the UL, as well as the Procedures for Organising ERASMUS+ Programme Mobility at the UL (Order No 1/363, 18.12.2014). According to these regulations, the recognition of learning outcomes acquired during mobility takes into account: 1) the compliance of the learning outcomes acquired during the mobility with the conditions of international exchange programmes and 2) the compliance of the learning outcomes acquired during the mobility with the requirements of the study programme of the University. The recognition of the learning outcomes acquired during the mobility is performed by the study programme director on the basis of the transcripts from the partner university or the certificate from the placement site. After the assessment, the recognised learning outcomes are included in the list of student's fulfilled academic obligations.

All students participating in exchange programmes must agree with the programme director a preliminary plan for the mobility course or placement before going on mobility. If changes are made to this plan during the exchange, these have to be agreed with the programme director. Such changes are often made, for example as in the case of the mobility of bachelor students Tatiana Visotina and Alice Tarusina to Charles University in Prague in 2020.

In the context of mastering the content of the BSP “Geology” programme, the curricula of the programmes in Geology are easily comparable to the curriculum of the BSP “Geology”, thus demonstrating that the content of the programme is in line with the study plans and contents of other European Universities. In some cases, students choose specific courses, such as “Geomedicine” or “Computer Programming” (Selva Tetere and Laura Ozoliņa, University of Ljubljana, Slovenia); although they cannot be equated with the mandatory or restricted elective

part of the BSP plan, they can be equated as an elective. The students' willingness and interest to take practical orientation courses, sometimes also those not offered by the BSP "Geology", is acknowledged; for example, five students in 2017 participated in the course GMIN 3015 "Practical Course in Ore Prospecting" leaded by prof. K. Sundblad (University of Turku) in Finland.

The study programme allows students to choose an initial specialisation in either bedrock geology, Quaternary geology and geomorphology, or applied geology, which is in high demand in the labour market, to provide them with the theoretical knowledge and practical skills base to continue their studies or work in their chosen field of specialisation.

**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.**

From 2016 to 2021, 43 bachelor theses have been developed in the field of geology, 14 in applied geology, 18 in bedrock geology, 11 in Quaternary geology, and 12 in two subfields of geology (bedrock geology and applied geology; Quaternary geology and geomorphology; and applied geology). This means that the sub-disciplines of geology are fairly evenly represented, and the use of themes and methodologies from different sub-disciplines of geology in the same work must be positively evaluated.

The largest number of topics is in bedrock geology, on the composition and formation of different formations. In recent years, the number of bachelor theses in geophysics and engineering geology has increased. This demonstrates the relevance of the study programme to labour market demand and the growing interest of students in future jobs. Since 2018, student interest in Quaternary geology and geomorphology has grown rapidly. The topics of the final theses are relevant to all sub-disciplines of geology, covering the latest scientific knowledge and problems of applied aspects.

During this period, the defended theses were graded between 5 and 10 ("average" for one student). High scores - 7-10 - dominate (Fig. 10). This generally reflects the diligence of undergraduate students and their desire to produce valuable research work rather than just to obtain a degree.

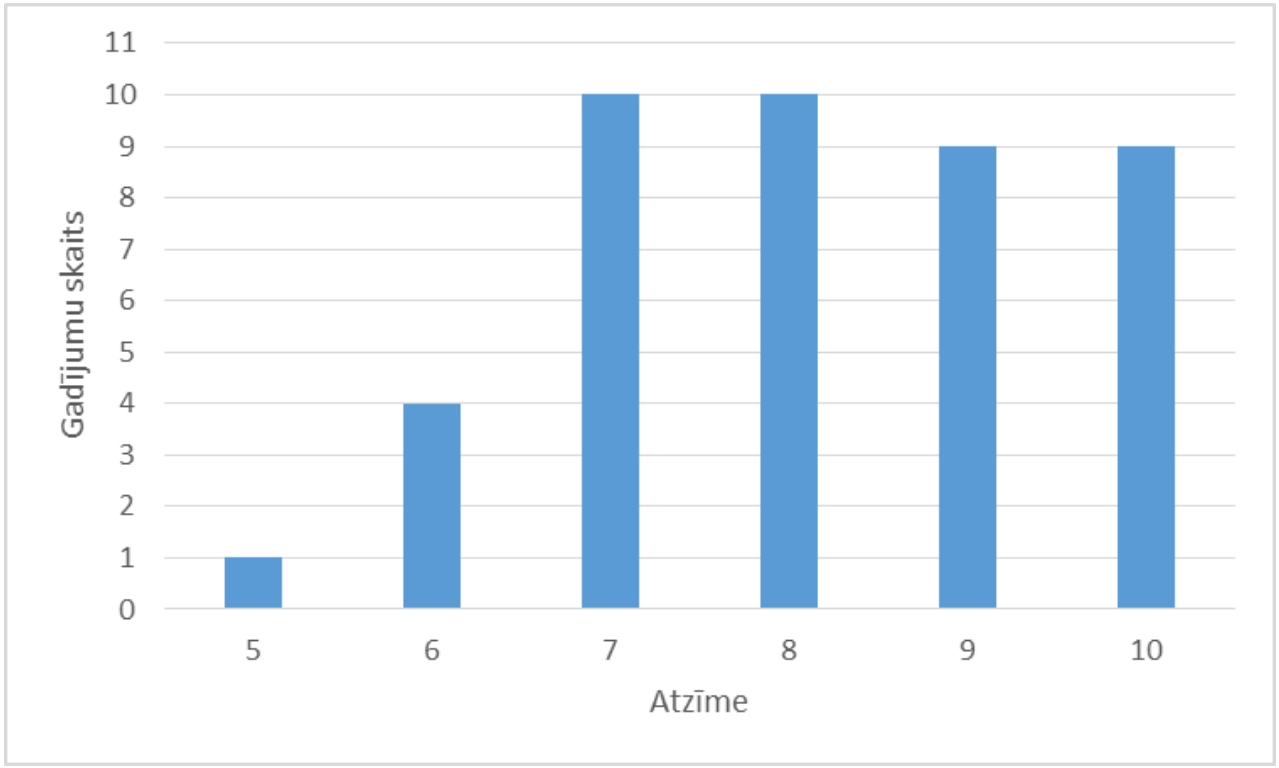



*Figure 10. Evaluations of the final theses of the Bachelor's study programme "Geology" in 2016 - 2021.*

## 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 study programme "Geology" is very well provided with the information base for study courses and bachelor's thesis development, which is determined by the location of the Natural Sciences Library of the University of Latvia in the premises of the House of Nature, the location of the Science Library of the UL in the adjacent House of Science, as well as access to a wide range of publication databases offered by the University of Latvia: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/.

For all study programme courses, e-learning courses have been created in the Moodle environment, where study materials are placed, updates are communicated between students and lecturers, mid-term examinations and exams are provided for some courses, as well as mid-term examination grades are entered and the final course grade is calculated.

The infrastructure of the Academic Centre for Natural Sciences allows students to stay and study in modern classrooms with interactive whiteboards and learn practical skills in spacious, well-equipped laboratories. The material and technical support available for the implementation of the field of study, as discussed in Section 2.3.2, is used for the implementation of the study programme. The material and technical equipment is renewed annually using the funding of the University of Latvia, the FGES, as well as project funds.

The acquisition of new equipment focuses on the development of applied geology and remote sensing techniques to equip students with the skills to work with equipment used in geology and related professions. The following new equipment has been acquired in recent years:

- DJI Advanced and DJI Pro drones, which are used in academic work, to provide material for laboratory work and students' final papers, and DJI Advanced has been used for glacier mapping in Antarctica;
- PMP400 Memmert programmable yawner;
- Scientex CG-6 gravimeter;
- Two magnetometers GEM Systems Walking magnetometer GSM-19-19W;
- Electrical resistance measurement equipment Syscal pro Switch, IRIS instrument;
- Seismograph GEODE SEISMOGRAPH-24 CH SYSTEM;
- Geophone 3D GPH, GSC 3C.3 GS20DX 14HZ;
- Geophone RTC-14HZ, 395OHN, VERTICAL, 1M;
- Enlid Reach RS+ (2 pcs.) and Enlid Reach M+ geographic positioning system receivers;
- RETSCH soil grain size sieves;
- soil testing equipment "Proctor modified test";
- soil sampling cylinder set, Stitz;
- Light Dynamic Sounding Machine, Stitz;
- ground field wing rotator kit, Stitz;
- soil particle density pycnometers, Matest;
- Automatic soil odometer, Wille Geotechnik Gmb;
- Automatic direct and conventional soil shear, Wille Geotechnik.

In 2019-2021, the infrastructure of the Mineralogy-Palaeontology Laboratory was improved with the purchase of a new optical microscope with built-in camera and linked computer, two cabinets with drawers and boxes for sample storage.

**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 Bachelor's study programme "Geology", the University of Latvia uses:

- a state budget grant from the Ministry of Education and Science, which in the academic year 2021/2022 is set at EUR 1630 for full-time studies. The sector coefficient is 1.9 and the level coefficient is 1, resulting in a state budget subsidy of € 3097 per student;
- tuition fee, taking into account all the factors referred to in the section "Financial support", which in the academic year 2021/2022 is set as follows:
- 2000 EUR per year for full-time studies;
- 2000 EUR for full-time international students.

Taking into account the above, the total budget of the study programme is expected to be 145 thousand 180 EUR, per year, the data are shown in Table 25.

*Table 25*

*Estimated annual income of the programme, EUR*

| Type of study | Number of students | Tuition fee/state grant | Total income |
|---|---|---|---|
| FTS (budget) | 43 | 3097 | 133 180 |
| FTS (fee) | 6 | 2000 | 12 000 |
| International students | 0 | 2000 | 0 |
| **Total** | | | **145 180** |

### Programme costs

In order to estimate the amount of funds required for financial provision, the cost of study programmes at the University of Latvia is calculated according to the methodology developed by the University of Latvia, which takes into account the costs of providing the study process and information on the study programme plan, reliability of forecasts.

### The full-time study programme costs

For calculations, the implementers of the study programme "Geology" use students data of the academic year 2020/2021 – 49 students study in the programme at the FTS, the existing/planned study programme plan after accreditation and the existing structure of the involved academic staff. Taking into account the above, the estimated full-time cost per full-time student of the programme is 2357 EUR per year, and the total cost of the programme is 115 502 EUR per year. A more detailed percentage cost breakdown is shown in Table 26.

*Table 26*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 45.3% |
| General staff. | 17.6% |
| Other payments | 0.0% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |
| **TOTAL COST** | **100.0%** |

Figure 11 shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

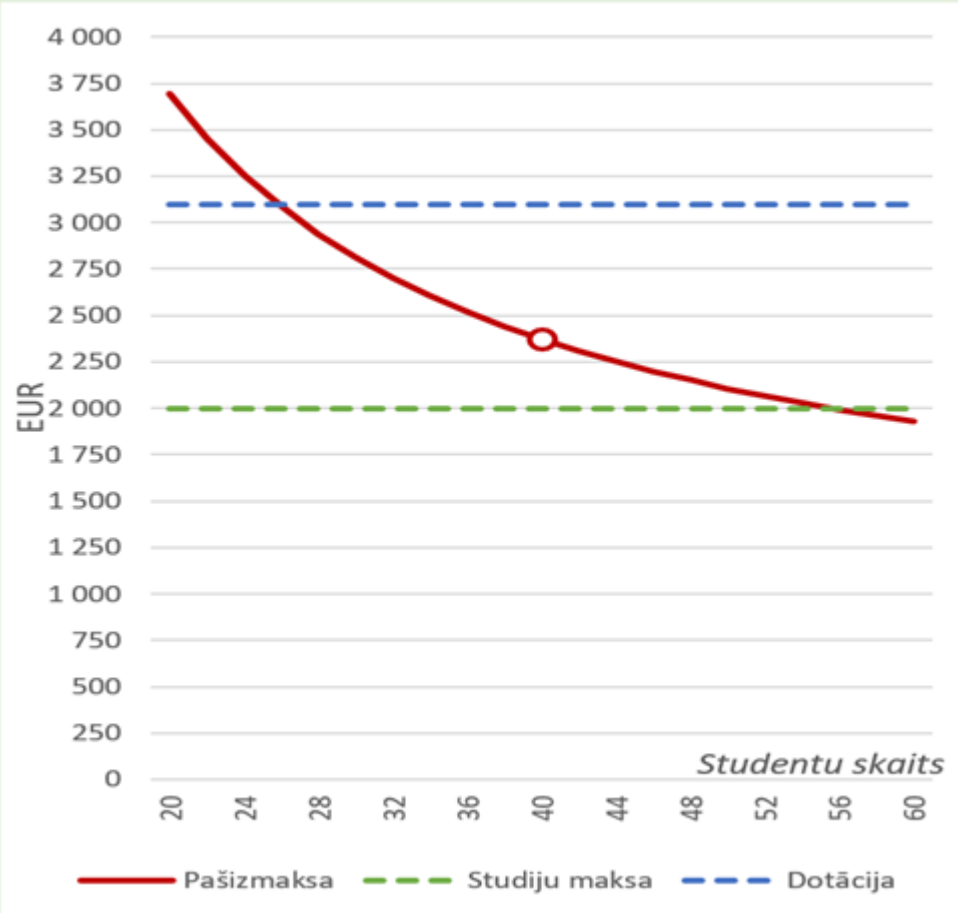



*Figure 11. Cost per student enrolled for the BSP "Geology"*

Based on the calculation, it can be seen that for the programme to be profitable and provide students with a quality study process, the number of fee-paying students in the programme (all

courses combined) must be at least 56 (intersection of red (cost) and green (tuition) lines projected on the x-axis). On the other hand, if there were only budget students in the programme, then their number should reach 28 students. Considering that the education fee for full-time foreign students is 2000 EUR, and if the programme had only foreign students, the number of students, excluding budget students, would have to reach 46 to be cost-effective.

**Summary of the revenue and expenditure of the programme**

Table 27 summarizes the programme revenue based on the number of students, state grants and tuition fees, and the programme expenses for such number of students.

*Table 27*

The result of the program

| Type of study | Number of students | Tuition fees/state subsidy | **Total income** | **Total cost** |
|---|---|---|---|---|
| FTS (budget) | 43 | 3097 | 133 180 | 101 360 |
| FTS (fee) | 6 | 2000 | 12 000 | 14 142 |
| International students | 0 | 2000 | 0 | 0 |
| **Total** | | | **145 180** | **115 502** |

The data presented in the table clearly show that the University of Latvia has sufficient resources to implement the study programme and ensure its further development. In addition, the development of the programme can be financed from the revenues 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 the development of programmes from the UL Study Quality Improvement Fund.

## 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.**

Five professors (24% of the total course load), five associate professors (42%), 10 assistant professors (25%), three lecturers, one principal researcher, three researchers, three lecturers (9%)

and one cartographic engineer participate in the implementation of the study programme. All those involved in teaching the theoretical part of the course have a Master's or PhD degree.

Thus, the number of professors and associate professors (10) is in full compliance with Article 55(1)(3) of the Law on Higher Education Institutions, which stipulates that "not less than five professors and associate professors who have been elected to academic positions at the respective higher education institution shall participate in the implementation of the compulsory part and the restricted optional part of academic study programmes".

Research activities of academic staff, participation in the development of international and Latvian Council of Science-funded projects directly and positively influence the study process. The research activities of the teaching staff are mostly closely related to the courses they teach ("Sedimentary Processes and Deposits", "Palaeontology and Stratigraphy", "Hydrogeology", "Quaternary Geology", "Geophysics"). The research activities provide an opportunity to provide insight into the latest research directions, current scientific and practical solutions related to the study content in individual study courses, as well as general issues in the development of the field of Earth Sciences. The development of course content is also directly related to the lecturer's research work. For example, the results of recent polar studies are used in several BSP “Geology” courses ("Geomorphology", "Geophysics"), as well as in LCS projects ("Establishment of a reference network of pollen and other microscopic remains for the Latvian territory - a fundamental basis for climate, landscape, Vegetation and Water Quality Reconstruction and Modelling" and "Prediction of Temporal Groundwater Drought with Mixed Models in a Multilayer Sedimentary Basin under Climate Change")) are integrated into the courses "Quaternary Geology" and "Geophysics".

When evaluating the use of research results in the study process, it should be noted that the findings of scientific research and current information obtained at international conferences are regularly reflected in lecture materials and discussed with students in seminars and practical classes. It allows to improve the content of the study courses and provides better communication with students, helps to achieve a deeper understanding of theoretical knowledge, promotes the acquisition of research methods and the skills to apply them.

The high qualifications of the teaching staff also enable them to meet the National Academic Education Standard (Part II, paragraphs 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 6$^{th}$ level of the framework specified in the Latvian Education Classification.

- The content of the Bachelor's study programme ensures the achievement of scientifically substantiated results of a wide range of studies.

The qualifications of the teaching staff contribute to the achievement of the learning outcomes of the Bachelor's study programme "Geology", as the distribution of the teaching staff is balanced – 10 professors and associate professors, 10 assistant professors and 11 other teaching staff. In addition, the academic staff is specialised in a wide range of geological fields (Quaternary geology, geomorphology, hydrogeology, engineering geology, mineral geology, sedimentology, palaeontology, etc.) and other fields (geomatics, environmental science, climatology, etc.), making it possible to provide students with the most recent scientific knowledge and relevant practical skills in a broad spectrum of natural sciences. The researchers and teaching staff include a number of young faculty members who may in the future form a succession of professors and associate professors.

### 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 the teaching staff has generally increased and the composition of the teaching staff has improved. Māris Krievāns and Kristaps Lamsters have been elected to the position of associate professors, and Normunds Stivriņš has been elected as professor; the number of associate professors and assistant professors has increased overall (Table 28).

In the period since 2017, several significant development activities have taken place for the professional development and renewal of the teaching staff of the BSP “Geology”. In the academic year 2021/2021, the teaching staff of the Bachelor's study programme "Geology" consists of 5 professors, 5 associate professors, 10 assistant professors, 3 lecturers, senior researchers, researchers and lecturers. The number of professors and associate professors (10) is in full compliance with Article 55(1)(3) of the Law on Higher Education Institutions. At the same time, the involvement of doctoral students in the study process is crucial and is progressing well. Among the teaching staff, there are several young faculty members, including assistant professors, senior researchers and researchers, who will form a full complement and replacement for the professoriate in the future.

The academic staff of the BSP "Geology" has the opportunity to improve their English language skills in the further education programme "Enhancing Professional English Language Skills of University Academic Staff" of the Centre of Applied Linguistics of the Faculty of Humanities of the University of Latvia. During the reporting period several faculty members (A. Dēliņa, E. Lukševičs, Ģ. Stinkulis) have participated in this programme and obtained a certificate of English language proficiency at C1 level. This also improved the teaching of lectures and study courses in the Erasmus programmes.

During the reporting period, the academic staff of the BSP “Geology” quite actively participated in various professional development courses, improving their knowledge and skills, including computer literacy, online learning development and digitisation of teaching content, rethoric and others. A major contribution to staff development in the area of leadership was the 36-hour training course "Competence Development of Academic Staff in Leadership"; the certificate was awarded to J. Karušs, Head of the Department of Geology. In order to improve their digital skills, which are particularly demanded during the period of distance learning, E. Lukševičs and N. Stivriņš attended the 36-hour course "Development of Digital Skills of Academic Staff". The 16-hour refresher course "Public Speaking, the Art of Speaking and the Basics of Presenting to Industry and Audiences" was attended by A. Dēliņa, and the 16-hour refresher course "Commercialisation Training" was attended by J. Karušs.

*Table 28.*

*Changes in the number of teaching staff in 2016 and 2021 in the BSP "Geology"*

| Academic position / Year | 2016 | 2021 |
|---|---|---|
| Professors | 6 | 5 |

| | | |
|---|---|---|
| Associated professors | 4 | 6 |
| Assistant professors | 10 | 11 |
| Leading researchers, researchers and lecturers | 13 | 13 |

The lecturer of the geology courses "Introduction in Bachelor Studies in Geology", "Geological Field Techniques", "Laboratory Testing Methods in Geology" and "Introduction to Spatial Analysis in Geology" is a researcher, PhD student MSc geol., Jurijs Ješkins. a PhD student MSc geol. Viesturs Zandersons is involved in supervising practical work in geology of mineral resources, and a PhD student MSc geol.Valters Alksnītis, is involved in supervising laboratory work in palaeontology. In the study course "Hydrogeology", Jānis Bikše, MSc geol., candidate of doctoral degree, is engaged to give individual lectures. Experienced colleagues prof. Vitālijs Zelčs and Dr. geol. Vija Hodireva have terminated their contractual relations with the FGES of the University of Latvia, and other colleagues are now teaching the courses in their place. Prof. Vitālijs Zelčs has thoughtfully promoted the involvement of students, then PhD students and young PhD holders in teaching and research for more than 10 years, as a result prof. N. Stivriņš, assoc. prof. K. Lamsters and assoc. prof. M. Krievāns now actively participate in teaching courses and research in the field of Quaternary geology and geomorphology. The study course "Minerals and Rocks" will be taught by assoc. prof. Ģ. Stinkulis. Prof. V. Segliņš no longer participates in teaching BSP “Geology” courses, he has entrusted the teaching of his developed courses to younger colleagues.

The renewal of the teaching staff and the increase in their qualifications have a positive impact on the quality of studies and student satisfaction with the study process as a whole.

**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).**

The cooperation among teaching staff is generally good, which is facilitated by the simultaneous involvement of several lecturers in teaching several study courses, joint activities in attracting projects and regular discussions. The staff of the Department of Geology meets regularly at meetings of the Department of Geology, at meetings of chairs and at Geography and Earth Sciences study field meetings to discuss curriculum quality and changes. A significant number of colleagues also collaborate on publications, joint field and laboratory work. Communication between teaching staff ensures that the programme's courses are relevant to each other, minimises overlaps between courses, and meets the programme's goal and objectives.

The programme's teaching staff consists of 31 lecturers, five of whom teach the UL core module and 16 the geology core module. The number of students has varied over the last 6 years from 47-64 to 55 now. The student-teaching staff ratio is therefore 1.5-2.1 students per one lecturer. Accordingly, the ratio of teaching staff per person is appropriate and such a team of teaching staff is able to ensure the achievement of the planned study programme outcommes and the implementation of a quality study process. It should be noted that all the teaching staff are also involved in teaching courses in other study programmes, mainly at the Faculty of Geography and Earth Sciences of the University of Latvia.

# 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 | Sample of diploma and its supplements to be issued for the acquisition of the study programme Appendix 35.docx | Par studiju programmas apgūšanu izsniedzamā diploma un tā pielikumu paraugs 35 pielikums.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) | Council of Higher Education Opinion Brief Appendix 36.docx | Augstākās izglītības padomes atzinums 36.pielikums.docx |
| 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 | Statistical data on students in the bachelor's study programme Geology Appendix 37.docx | Statistikas dati par studējošajiem bakalaura studiju programmā "Ģeoloģija" 37. pielikums.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 | Compliance of the Bachelor's study programme Geology with the State Education Standard Appendix 38.docx | Bakalaura studiju programmas "Ģeoloģija" atbilstība valsts izglītības standartam 38. pielikums.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 | Course mapping of the bachelor's study programme Geology Appendix 39.docx | Bakalaura studiju programmas "Ģeoloģija" studiju kursu kartējums 39. pielikums.docx |
| The curriculum of the study programme (for each type and form of the implementation of the study programme) | Plan of the Bachelor's study programme Geology Appendix 40.docx | Bakalaura studiju programmas "Ģeoloģija" plāns 40. pielikums.docx |
| Descriptions of the study courses/ modules | Course descriptions of bachelor study programme Geology Appendix 41.docx | Bakalaura studiju programmas Ģeologija studiju kursu apraksti 41. pielikums.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) | Certification that academic staff of the academic study Geology bachelor programme complies with the requirements laid down in Section 55 Appendix 11.docx | Apliecinājums ĢBS.docx |

# Geology (45442)

| | |
|---|---|
| Study field | *Geography and Earth Sciences* |
| ProcedureStudyProgram.Name | *Geology* |
| Education classification code | *45442* |
| Type of the study programme | *Academic master study programme* |
| Name of the study programme director | *Ģirts* |
| Surname of the study programme director | *Stinkulis* |
| E-mail of the study programme director | *girts.stinkulis@lu.lv* |
| Title of the study programme director | *Asociētais profesors, Dr. geol.* |
| Phone of the study programme director | *+37126588598* |
| Goal of the study programme | *To provide academic education in geology, gaining modern theoretical and methodological knowledge in such sub-sectors of geology as Quaternary geology and geomorphology, applied geology and bedrock geology, developing skills in research work and promoting the strengthening of practical skills required in the labor market.* |
| Tasks of the study programme | *1) to provide opportunities to acquire up-to-date knowledge and develop the ability to apply it in one of the sub-disciplines of geology (Quaternary geology and geomorphology, applied geology, bedrock geology), as well as to gain an understanding of the general trends and developments in geological science;*<br>*2) to foster the development of practical and research skills for competitiveness in the labour market, as well as the understanding of the foundations of innovative activity;*<br>*3) to facilitate the development of skills and competences and critical thinking necessary for scientific research within the Master's thesis and for further doctoral studies.* |

| | |
|---|---|
| Results of the study programme | *The learning outcomes to be achieved include the knowledge, skills and competences of the Bachelor's degree, which are developed and complemented in the Master's degree. In addition to the Bachelor's knowledge, skills and competences, the Master's degree in Geology shall have the following knowledge, skills and competencies:*<br>*KNOWLEDGE*<br>*1. Demonstrate understanding of the principles of geology, a critical understanding of the current achievements of geology in terms of the most important direction and the concepts and theories of the selected related sub-sectors, an in-depth understanding of the Earth system in the field of specialization.*<br>*2. Demonstrate in-depth knowledge of theories, concepts, methodologies of at least one of the sub-sectors of geology.*<br>*3. Are familiar with the scope of study required for independent research, the methodological framework that provides the basis for research and professional activity in the field of geology and other fields of natural sciences, and which is sufficient for continuing studies in doctoral studies.*<br>*4. Identify and perform complex, partly defined and unusual geological tasks, at least partially formulate and solve problems in new and potential areas of geology, use the latest or innovative methods in problem solving. Using the achievements of other disciplines, think creatively to develop new and original approaches and methods.*<br>*SKILLS*<br>*5. Develop appropriate experiments, analyse and interpret data, and draw conclusions by integrating knowledge from different disciplines and, taking into account the complexity of processing, use modern and tuned quantitative methods.*<br>*6. Independently promote the development and specialization of their competencies, work effectively as a team leader, take responsibility for the results of group work and their analysis; practically use the methods and techniques applicable to a particular specialization, orientate within their limits, and within the limits of current knowledge.*<br>*7. Apply innovative technologies, knowledge and understanding in practical development of complex geological systems and process models, promote further development of geology in practice and research; independently acquire, use and communicate geological information, select and practically apply appropriate geological research methods in order to perform research activities or functions of a geologist at a high professional level.*<br>*COMPETENCE*<br>*8. Work effectively and communicate in a national and international context, to understand the role of geology in the development of knowledge, raising prosperity and improving the quality of life.*<br>*9. Working individually and in a team, integrate the concepts of geology and other fields in the development of new knowledge and methods, show understanding and ethical responsibility for the results of geological research or the potential impact of professional activities on the environment and society.*<br>*10. Critically evaluate professional and scientific work (publications), demonstrate skills to plan and implement further professional development programs.* |
| 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) | *Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in natural sciences. Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in other fields of sciences, and entrance examination.* |
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Master of Natural Sciences in Geology* |
| 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 - 2 years - english**

| | |
|---|---|
| Study type and form | *Full time studies* |
| Duration in full years | *2* |
| Duration in month | *0* |
| Language | *english* |
| Amount (CP) | *80* |
| Admission requirements (in English) | *Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in natural sciences. Previous education: Bachelor's and/or Master's degree or second level professional higher education or equivalent higher education in other fields of sciences, and entrance examination. Studies in English require English language skills in accordance with the applicable laws and regulations (for foreigners - English language skills at least at B2 level.* |
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Master of Natural Sciences in Geology* |
| 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, minor changes have been made to the parameters of the Master's study programme “Geology” in order to increase the compliance of the programme with changes in regulatory enactments: the learning outcomes to be achieved formulated in accordance with the Regulations on the Latvian Classification of Education (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas - the document is available only in Latvian, without official translation in English), as well as admission requirements were simplified.

Study results are structured as knowledge, skills and competence, and are also divided into 10 subsections.

During the previous accreditation period, there were requirements for matriculation of persons with a Bachelor's degree in natural sciences (or equivalent higher education) in geology, geography, environmental science, biology, chemistry, physics or a Bachelor's degree in engineering (or equivalent higher education) in construction.

Currently, matriculation requirements are differentiated depending on the field of previous education. Persons with Bachelor's and/or Master's degrees or second-level professional higher education, or equivalent higher education in natural sciences, enroll in the program without organizing an entrance examination. If such an education has been obtained in other fields, an entrance exam is organized, where the person's previous experience and competence in geology is checked, determining the ability to study geology at the Master's level. This differentiated matriculation approach gives the opportunity to study geology at the Master's degree also for persons who have worked practically in geology, but obtained a bachelor's degree in area different from geology.

### 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 implementation of the Academic Master's study programme "Geology" is in line with the aim and objectives of the study field "Geography and Earth Sciences", because geology is one of the Earth sciences, and one of the natural sciences. The graduates of the Master's study programme "Geology" receive a Master of Natural Sciences degree in Geology, which corresponds to the

scientific field and study field. The goal, objectives and learning outcomes of the study programme are also in line with Master's level studies in geology, as they enable the acquisition of in-depth knowledge, skills and competences and directly correspond to the field of study and the title of the study programme. The first two digits of the programme code (45442) indicate the level of study – academic education (Master's degree), while the third-fifth digits (442) correspond to the field of study - Geography and Earth Sciences. Hence, the programme code is correct and matches the other program parameters. Balancing the level of graduates' knowledge and practical skills, their desire to enter the labour market as quickly as possible, and the duration of their studies, the current study duration is optimal.

The usefulness of Master's studies in geology in English is determined by the opportunity for foreign students to acquire unique, specific knowledge and practical skills about the geological structure of the Baltic States. It is also important for improving the quality of studies and developing international cooperation.

The right to continue academic studies in a Master's study program is after completing a Bachelor's program or a second-level Professional Higher education program, if the relevant Master's study program admission requirements have been met, which include appropriate prerequisites for successfully completing the Master's study program.

The admission requirements comply with Clause 14 of the "Regulations on the State Academic Education Standard" of Latvia. They are relevant to the degree awarded as a result of acquiting the study programme, as it provides the opportunity to study geology at the master's level for all interested persons who have a bachelor's degree or an equivalent higher education in natural sciences. For those applicants, who have received previous education in other fields, the ability to study geology at the Master's level is controlled with the help of an entrance examination.

During the entrance examination, the commission questions the persons to be matriculated and takes into account:
1) evaluation of the questions of the interview;
2) the motivation for the choice of studies, the intended research direction;
3) work experience in research, presenting a report at scientific conferences;
4) internship at foreign universities and research institutions;
5) the actuality of the expected topic of the Master's thesis and its relevance to current directions of geological research;
6) present implementation state of the Master's thesis.

A score is assigned for each of these points, and the overall result of the admission interview is included in the formula for calculating the total competition score.

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

The Master's study programme "Geology" is the only study programme in geology at this level in Latvia, and study places are available with funding from the state budget, thus meeting at least part of the labour market demand for highly qualified specialists in geology and related fields. The geology job market in Latvia is fairly stable, largely due to the increase in construction, rail and road works, which are closely linked to mineral exploration for building materials and road construction materials, as well as engineering geological studies. Demand The demand for borehole

drilling and related groundwater studies has also continued unabated. There is a relatively high and stable demand for qualified geoscientists in the above areas. This is reflected in the information provided by bachelor’s and master’s students of geology and in the regular interest of employers in new recruits. Several geology graduates have become employers themselves. They engage young professionals, but at the same time make reasonable demands on the knowledge and skills acquired in basic Earth science studies. The Master's study programme provides specialists with Master's degrees for the labour market in private companies in the fields of engineering geology, hydrogeology, mineral prospecting and exploration, geophysics. The programme trains specialists in the growing field of geoscience research, which is supported by science base and performance funding, funding from the LCS, other research grants from Latvia and the European Union, and contract work.

The relevance of the programme to labour market demand is demonstrated by the results of regular alumni surveys. The October 2021 alumni survey was completed by 36 respondents. When analysing their employment, it can be concluded that the vast majority of respondents (97%) work in Latvia. The majority of respondents (72%) work in geology or a related field. Of all respondents, 25% work for private geological companies, 36% for public institutions in geology or a related field (geography, environmental science, geodesy, etc.), 36% work for other institutions and fields, and no respondents are unemployed. Of all respondents, 36% are continuing their studies or participating in research at the UL or other universities, while 64% are not studying or participating in research. An analysis of graduates' employment shows that by far the majority of graduates of the Master's degree programme "Geology" are employed in their chosen or related specialisation.

The results of student, alumni and employer surveys are used to improve the quality of studies. For example, the course "Geological Studies in the European Union" regularly received low ratings and critical comments in student surveys. Therefore, in the academic year 2020/2021 the lecturer of this course was changed, and from the academic year 2022/2023 this course will be excluded from the Master's study programme "Geology", instead a new study course "Tectonics" will be developed.

The study program in English is intended for those who want to study both in the Baltic States and in wider regions of the world. Geology is a broad scientific and practical field, with job offers in Europe and beyond its borders in engineering geology, hydrogeology, Economic geology, geophysics, etc., including interdisciplinary fields. Specialists with knowledge in both geology and the international terminology of the industry are in demand in Latvia, especially in large construction projects where companies from different countries participate and research of soils, commercial minerals and ground waters is required. An example of this can be noted the construction process of the railway Rail Baltica.

The program offers both general Master's level knowledge and the opportunity to specialize in areas demanded by the labor market in the world and in Latvia.

The economic and social rationale for implementing the programme in English is as follows:

1) it offers opportunities for those who want to study in the Baltic countries and those living outside them to learn the specifics of the geological structure of Latvia and similar territories theoretically and practically, which is difficult to do in regions with a different type of geological structure. It provides opportunities to work in the field of geology in the Baltic States;

2) it allows those interested from other countries to broaden their horizons and learn sub-branches of geology that are traditionally strong in Latvia: glacial geology, geomorphology, paleontology, etc.;

3) at the same time, students are attracted to the University of Latvia, thus developing and

strengthen ing natural science studies at the UL;

4) the competence of teaching staff and the quality of study materials improves.

**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.**

All students in the Master's study programme "Geology" have studied in Latvian, except for exchange students, for whom lectures, practical, laboratory, field work and individual consultations have been conducted in English. The data show that the number of matriculated students has slightly decreased in the last six years, as has the number of graduates. There are several reasons for the decline in the number of matriculated students. Firstly, this is due to a decrease in the number of students enrolled in the Bachelor's degree programme "Geology". Secondly, as we have seen from our conversations with undergraduates, a number of them are choosing to work instead of continuing their studies, in the field of geology, where there is a high demand for skilled professionals. According to the information provided by students, this is also the most important drop-out problem in the Master's study programme in geology.

From the academic year 2015/2016 to 2021/2022, the residence of foreign students has been mainly the University of Oviedo in Spain (a long-term cooperation partner of the Department of Geology of the FGES), as well as the University of Münster in Germany.

In the same period, students of the Master's study programme "Geology" of the UL FGES have studied at such foreign universities as the University of Ljubljana (Slovenia), Charles University in Prague (Czech Republic), University of Oviedo (Spain) and University of Aarhus (Denmark).

Student mobility indicators are stable, however, considering the total number of students in the programme, relatively low. Conversations with incoming and outgoing students show that their experience is mostly positive, which provides a basis for expanding student mobility.

**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.**

Since the academic year 2009/2010, the Master's study programme "Geology" is fully compliant with the Lisbon Convention (1997), the Bologna Declaration (1999) and other international documents regulating higher education. The duration of studies is two years (four semesters). At the end of the studies, a master's thesis is prepared, which is an original research in one of the subfields of geological science.

The MSP "Geology" consists of Parts A (mandatory), B (restricted electives) and C (free electives), which account for 65%, 30% and 5% of the total credits respectively. Part A consists of the Master's thesis (20 CP) and study courses (32 CP in total), which provides in-depth study of geology and related Earth sciences, regional features of the geological structure of Latvia, as well as modern methods and knowledge of global tectonics and mineral resources of the Earth. Part B consists of courses of 24 CP, which allow students to specialise in one of the sub-disciplines of geology approved by the Latvian Council of Science – Quaternary Geology and Geomorphology or Bedrock Geology, or Applied Geology, and choose restricted elective courses that will help them enter the labour market more successfully. As a result of the acquisition of Part A courses, in addition to the Bachelor's competencies, the Master's degree holder is able to demonstrate an understanding of the most important concepts and theories of modern geology and selected related sub-sectors, but Part B courses will demonstrate in-depth knowledge of at least one geological sub-sector. In 2021, Part C of 4 CP is included in the study programme to allow students to acquire broader knowledge according to their interests, as well as to acquire methodological and theoretical knowledge from other disciplines, if this is necessary for the development of their Master's thesis.

The aims, objectives and learning outcomes of the study courses assume that the graduates of the programme are able to independently collect, analyse, use and communicate geological information, select and practically apply the necessary geological research methods in order to perform research activities or geological functions at a high professional level. Thus, the aims, objectives and learning outcomes of the study courses correspond to the goal of the study programme "to provide academic education in geology, providing up-to-date theoretical and methodological knowledge in geological subfields such as quaternary geology and geomorphology, applied geology and bedrock geology, developing research skills and strengthening practical skills needed in the labour market", objectives and learning outcomes.

The content of the courses is designed to meet the requirements of the labour market. It meets these requirements in the the applied sphere, in state and municipal institutions, and in research.

The teaching staff are actively involved in research, as evidenced by their academic and scientific qualifications, as well as their list of publications. They provide the basis for integrating the latest scientific developments into the course content. Course content is usually updated at least every two years in line with the latest scientific developments, and the course description is also updated if changes are significant. All MSP "Geology" course descriptions have been updated at the end of 2021 in preparation for the accreditation of the field of study. It should be noted that the study programme includes several courses (Mathematics in Geosciences, Geoarchaeology, Remotely-Sensed Image Interpretation) that provide knowledge of other disciplines. This is in line with the trend of modern science to become increasingly interdisciplinary.

**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 award of the Master of Natural Sciences in Geology is based on the achievements and insights of the fields of geology and Earth Sciences, as the programme includes courses in all geological sub-disciplines defined in Latvia, as well as in the most globally relevant fields (tectonics, mineralogy, sedimentology, stratigraphy, palaeontology, engineering geology, hydrogeology, geology of mineral deposits, Quaternary geology, geomorphology and glacial geology). The study programme also focuses on the geological structure of Latvia and applied geology, which are important in the labour market.

The study programme is implemented mainly by teaching staff with doctoral degrees in geology but in some cases also in geography, chemistry and mathematics. Some of the lecturers who lead the practical works have a Master's degree in geology. Lecturers are mainly involved in research (publications, projects) in the field of geology and represent all its sub-disciplines – bedrock geology, Quaternary geology and geomorphology, as well as applied geology. A small number of lecturers carry out research in geography, environmental science and mathematics, which contributes to the interdisciplinarity of the study programme.

The degrees and research areas awarded are an indication of the faculty's ability to provide students with study courses based on the latest advances and knowledge in the field, as well as of the fact that the Master of Natural Sciences degree in Geology is based on advances in 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.**

During the study courses and examinations, both oral, written and combined study and assessment methods are used. The 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 (e.g. in courses such as "Testing and Investigation Methods in Engineering Geology and their Methodology", "Hydrogeological Modelling"). Practical assignments, seminars, individual, pair and group work, discussions and project development, study tours to industry organizations, including quarries, JSC "Latvijas Gāze" Inčukalns gas storage facility, the Latvian Centre for Environment, Geology and Meteorology core storage facility and elsewhere, are widely used. Compared to the Bachelor's

programme, less laboratory work is organised. Employers are involved in the implementation and development of study courses and are invited to lead individual classes (e.g. in the course " Exploration Methods of Quaternary Mineral Deposits"), including classes organised as experience exchange visits to workplaces (e.g. "Geolite" Ltd).

In order 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. For example, the knowledge acquired in the course "Sedimentary Processes and Sediments" of the Bachelor's study programme "Geology" can be extended and deepened in the Master's degree course "Sedimentary Environment and Processes", the Bachelor's degree course "Palaeontology and Stratigraphy" serves as a basis for extending knowledge and practical skills in the Master's degree courses "Micropalaeontology", "Phylogeny of Life" and "Event and Sequence Stratigraphy". The latter course also integrates and builds on the knowledge and practical skills previously acquired in the different undergraduate courses "Sedimentary Processes and Deposits" and "Palaeontology and Stratigraphy". There are also follow-up courses in all areas of applied geology – hydrogeology, engineering geology, mineral geology and geophysics – to deepen and strengthen students' knowledge and skills in areas relevant to the labour market. Seminars are organised in almost all courses to improve students' speaking, presentation and discussion skills.

To aid students in achieving learning outcomes – in acquiring and consolidating knowledge, skills and competence – the study process is dominated by student-centred methods. The study process is supported by methods that facilitate students' communication in the implementation of study tasks, solving real-world problems, modelling situations (e.g. in the study courses “Data Bases and Geological Modelling”; “Geology of Mineral Deposits”).

The physical environment of studies is also gradually changing: classrooms are easily transformable for group work, individual work, students can use digital technologies. The teaching staff mainly use methods that encourage students' active participation, critical thinking and reflection. The e-learning environment is used in the study process and to promote independent studies. Each study course has an e-learning environment (Moodle) where students have access to lesson materials, 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-learning environment.

The study methods for implementing the study programme in English are analogous to its implementation in Latvian.

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 teaching staff and students on the content of studies, forms and methods of organization. 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, the teaching staff use methods, examination forms and assessment criteria that are appropriate to the study goal and planned learning outcomes.

Students receive support and feedback from the teaching staff during the study process. Grading criteria for marking are made public in advance. The assessment gives students an opportunity to demonstrate the extent to which they have achieved the planned learning outcomes.

Student mobility is encouraged in line with the principles of student-centred education. Students mainly visit universities of other countries (Spain, Czech Republic, Denmark, etc.) within the ERASMUS+ programme, but when they return to study at the University, their study results are

recognised - equated to the study results of the academic study programme "Geology". Before going on exchange studies, the study plan is developed in cooperation with the director of the respective programme of the University of Latvia and the persons responsible for mobility of the host university so that it coincides as closely as possible with the relevant plan of the University of Latvia, according to ERASMUS + documentation. When a student arrives at a university abroad, it happens that these plans often have to be changed because the courses in question are not available in English or are not offered in that semester. ERASMUS+ also has a mechanism for this – a document signed by both universities and the student to change the study plan. The curricula and programmes of different universities are not a close match, so mandatory courses are usually aligned as closely as possible to the UL programme, but restricted electives courses are open to more variation to ensure that they still fit with the research and study focus of geology. Exchange studies contribute to the improvement of the quality of studies in the academic study programme "Geology", as students gain additional knowledge, skills and competence:

- in areas with a different geological structure from Latvia;
- universities with different specialisations within the field of geology, allowing for additional areas of geology;
- in a foreign language, thus expanding opportunities to work in an international labour market.

Students participate in research initiated by the academic staff and social activities in society, thus gaining significant experience, using what has been learned 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. Students are familiarised with the procedure for submitting proposals at the beginning of studies. This is done by the programme director, agreeing with the students the place and time of the individual introductory lecture. A large part of students is already familiar with the normative documents regulating the study process since their undergraduate studies at the University. The results of student surveys are evaluated and taken into account 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 director.

Independent student work performed in addition to classroom activities, laboratories and field studies is very important in the study process ,. This is mostly done individually, but the analysis and reporting of the results of field and laboratory studies are done in groups in some courses. Independent work includes studying e-learning materials and scientific literature, preparing for seminars, processing and reporting results obtained in practical, field and laboratory work, preparing reports, presentations, etc. In addition, during their studies, Master's students can take part in the PhD School "Land Resources and their Sustainable Use", which offers an opportunity to participate in seminars and guest lectures on various topics. Students are also offered opportunities to get involved in research projects at the Faculty. Typically, project leaders or principal investigators offer projects to students who already have an interest and a background in the project topic. For example, geology graduate students Valters Alksnītis, Gunita Lagzdiņa, Simona Mačute and Linda Vernera worked on the project "Influence of tidal regime and climate on the Middle-Late Devonian biota in the continental Baltic paleobasin (lzp-2018/2-0231)" in 2018-2020. All of them also successfully completed their Master's theses on topics related to the themes of the project, while their field and laboratory work, as well as their findinngs, contributed to the completion of the project. The involvement of master students in projects during the reporting period has taken place within all sub-sectors of geology.

The Covid-19 pandemic led to a significant change in the way studies were delivered – distance

learning became an important, and sometimes the only, way of studying. Overall, the impact of distance learning on the quality of studies is negative, mainly due to the loss of student motivation and the inability to provide practical, laboratory and field work of an adequate quality. This is also reflected in student surveys and discussions with students. However, distance learning allowed students and teaching staff to rapidly develop their skills and competence with MS Teams, Zoom and other tools, to make greater use of the e-learning environment, and to offer innovative solutions for practical work.

During the periods when face-to-face classes were not possible for long intervals, some of the fieldwork and practical assignments were designed so that students could do them individually. For example, in the course "Regional Geology and Geomorphology of Latvia", students individually visited a geological object (of their choice, in a location easily accessible to them), characterised it according to a set plan, and presented the results of their research in a remote seminar. However, during the pandemic, the study process was mostly planned in such a way that practical, laboratory and field works were carried out in person during the periods when it was epidemiologically feasible.

The number of international students in the study programme so far has been small, and they were ERASMUS+ programme students. The students are participating in lectures together with Latvian students, and the proportion of Latvian vs English language usage is agreed among the students and teachers. For example, in the study course "Sedimentary processes and environments" the lectures are organised in English, but all terminology is explained in English and Latvian. Practical and laboratory works are organised individually, in Latvian or English, as favourable for each student. Students give their presentations either in Latvian or English.

In case of larger number of international students the organisation of separate learning groups in Latvian and English will be considered.

**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.**

From 2016 to 2021, 36 master's theses have been developed in the field of geology, 13 in applied geology, 11 in bedrock geology, 6 in Quaternary geology, and 6 in two subfields of geology (bedrock geology and applied geology; Quaternary geology and geomorphology, and applied geology). This means that the sub-disciplines of geology are fairly evenly represented, and the use of themes and methodologies from different sub-disciplines of geology in the same work must be positively evaluated.

The largest number of theses is in applied geology – 13. In addition, in each of the papers where two disciplines are represented, one of them is applied geology. The total number of theses in applied geology is 19, that is more than half of all Master's theses. This clearly demonstrates the programme's emphasis on applied research and its link to labour market demand. Several themes of all sub-disciplines correspond to the themes of projects involving students and academic staff of the Department of Geology, which shows the relevance of the Master's students' work.

During this period, the defended theses have received grades ranging from 5 (average) to 10 (excellent). High grades – 8-10 – dominate, accounting for 67% of all defended papers (Fig. 12). This generally reflects the diligence and willingness of Master's students to produce valuable research work rather than just to obtain a degree.

Examples of themes of Master's theses: "Physical-mechanical properties of dolomites of the Devonian Pļaviņas Formation", "Pathologies in the fish fossils from the Upper Devonian, Famennian deposits of Latvia", "Studies of Staicele magnetic anomaly".

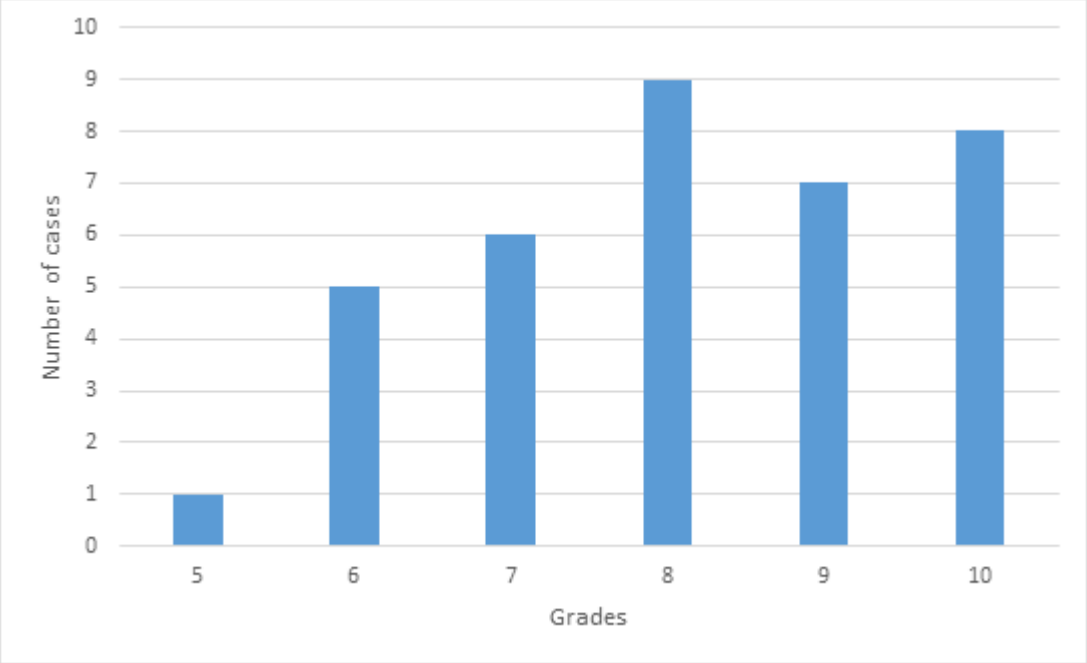



*Figure 12. Master thesis evaluations in 2016-2021 academic years.*

## 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 study programme "Geology" is very well provided with the information base for study courses and Master's thesis development, which is determined by the location of the Natural Sciences Library of the University of Latvia in the premises of the House of Nature, the location of the UL Science Library in the adjacent House of Science , as well as access to a wide range of publication databases offered by the University of Latvia: https://www.biblioteka.lu.lv/resursi/abonetie-e-resursi/.

For all study programme courses, e-learning courses have been created in the Moodle environment, where study materials are placed, updates are communicated between students and teaching staff, mid-term examinations and examinations are provided for some courses, as well as mid-term examination grades are entered and the final course grade is calculated.

The infrastructure of the Academic Centre for Natural Sciences allows students to stay and study in modern classrooms with interactive whiteboards and learn practical skills in spacious, well-equipped laboratories.

The material and technical support available for the implementation of the study field, as discussed in Section 2.3.2, is used for the implementation of the study programme. The material and technical equipment is renewed annually using the funding of the University of Latvia, the FGES, as well as project funds.

The acquisition of new equipment focuses on the development of applied geology and remote sensing techniques to equip students with the skills to work with equipment used in geology and related professions. The following new equipment has been acquired in 2018/2019 academic year:

- DJI Advanced and DJI Pro drones, which are used in academic work, to provide material for laboratory work and students' final papers, and DJI Advanced has been used for glacier mapping in Antarctica;

- PMP400 Memmert programmable yawner;

- Electrical resistance measurement equipment Syscal pro Switch, IRIS instrument;

- Scientex CG-6 gravimeter;

- Two magnetometers GEM Systems Walking magnetometer GSM-19-19W;

- Enlid Reach RS+ (2 pcs.) and Enlid Reach M+ geographic positioning system receivers;

- RETSCH soil grain size sieves.

In 2019-2021, the infrastructure of the Mineralogy-Palaeontology Laboratory was improved with the purchase of a new optical microscope with built-in camera and linked computer, two cabinets with drawers and boxes for sample storage.

**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 Master's study programme "Geology", the University of Latvia uses:

- a state budget grant from the Ministry of Education and Science, which in the academic year 2021/2022 is set at EUR 1630 for full-time studies. The sector coefficient is 1.9 and the level coefficient is 1.5, resulting in a state budget subsidy of € 4646 per student;
- tuition fee, taking into account all the factors referred to in the section "Financial support", which in the academic year 2021/2022 is set as follows:
- 2000 EUR per year for full-time studies;
- 2000 EUR for full-time international students.

Taking into account the above, the total budget of the study programme is expected to be 65 thousand 41 EUR, per year, the data are shown in Table 29.

*Table 29*

*Estimated annual income of the programme, EUR*

| Type of study | Number of students | Tuition fee/state grant | Total income |
|---|---|---|---|
| FTS (budget) | 14 | 4646 | 65 041 |
| FTS (fee) | 0 | 2000 | 0 |
| International students | 0 | 2000 | 0 |
| **Total** | | | **65 041** |

**Programme costs**

In order to estimate the amount of funds required for financial provision, the cost of study programmes at the University of Latvia is calculated according to the methodology developed by the University of Latvia, which takes into account the costs of providing the study process and information on the study programme plan, reliability of forecasts.

**The full-time study programme costs**

For calculations, the implementers of the study programme “Geology” use students data of the academic year 2020/2021 – 14 students study in the programme at the FTS, the existing/planned study programme plan after accreditation and the existing structure of the involved academic staff. Taking into account the above, the estimated full-time cost per full-time student of the program is 4623 EUR per year, and the total cost of the program is 64 719 EUR per year. A more detailed percentage cost breakdown is shown in Table 30.

*Table 30*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 53.3% |
| General staff. | 9.4% |
| Other payments | 0.0% |
| Infrastructure expenditure | 9.2% |
| Property and services | 2.0% |
| Indirect costs | 26.1% |
| **TOTAL COST** | **100.0%** |

Figure 13shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

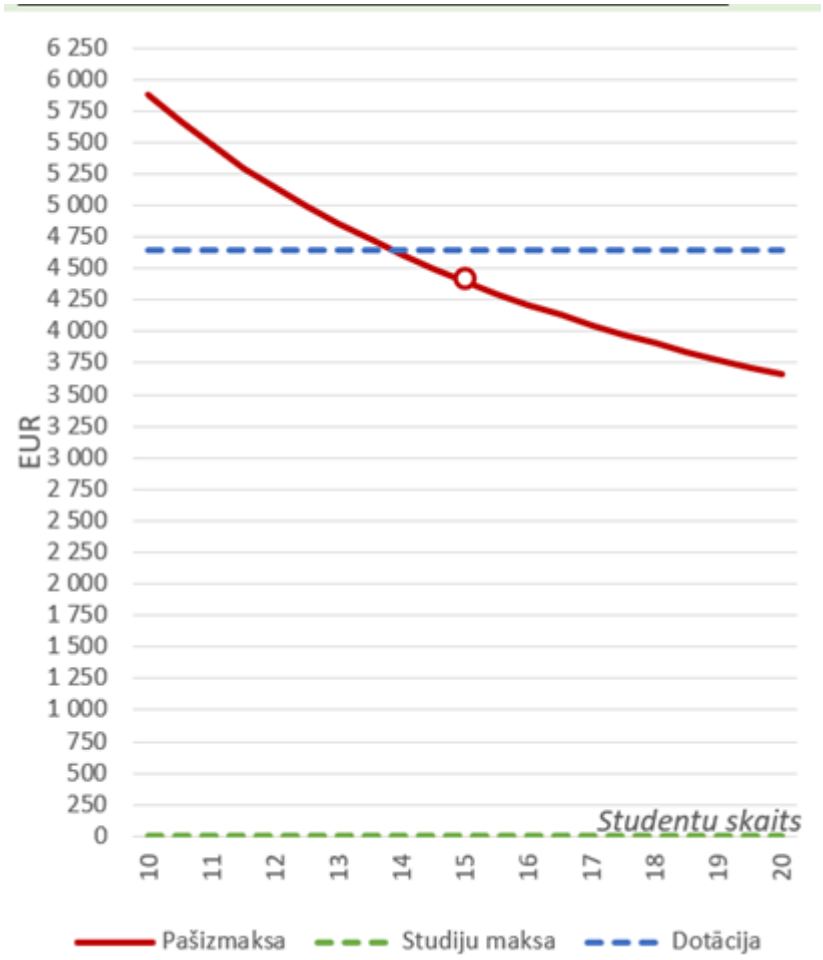



*Figure 13. Cost per student enrolled for the MSP "Geology"*

Based on the calculation, it can be seen that for the programme to be profitable and provide students with a quality study process, the number of fee-paying students in the programme (all courses combined) must be more than 20 (intersection of red (cost) and green (tuition) lines projected on the x-axis). On the other hand, if there were only budget students in the programme, then their number should reach 14 students.

**Summary of the revenue and expenditure of the programme**

Table 31 summarizes the programme revenue based on the number of students, state grants and tuition fees, and the programme expenses for such number of students.

*Table 31*

*The result of the programme*

| Type of study | Number of students | Tuition fees/state subsidy | **Total income** | **Total cost** |
|---|---|---|---|---|
| FTS (budget) | 14 | 4646 | 65 041 | 64 719 |
| FTS (fee) | 0 | 2000 | 0 | 0 |
| International students | 0 | 2000 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| **Total** | | | **65 041** | **64 719** |

The data presented in the table clearly show that the University of Latvia has sufficient resources to implement the study programme and ensure its further development. The analysed resources are fully in line with the specificity of the study programme, they allow for the successful achievement of all learning outcomes, as evidenced by the number of graduates who successfully enter the labour market segment of specialists and managers at various levels, as well as continue their studies at doctoral level. The funds allocated ensure that the quality of the study process will not be hampered in the future. In view of the low number of students and the high demand for qualified geoscientists in the labour market, the programme director and the Department of Geology are developing and expanding the promotional activities for the Master's degree in Geology. In addition, the development of the programme can be financed from the revenues 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 the development of programmes from the UL Study Quality Improvement Fund.

The minimum number of students required for the study program does not depend on its implementation in English or Latvian, as the instructors and study courses do not differ.

## 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.**

Four professors (24% of the total course load), five associate professors (42%), four assistant professors (25%), four lecturers, senior researcher and researchers (9%) participate in the implementation of the study programme. All those involved in teaching the theoretical part of the course have a doctoral (PhD) degree, and one of the lecturers involved in supervising the practical work is a Master of Geology, PhD student. Almost all representatives of the teaching staff (91%) are elected at the University of Latvia. Thus, the number of professors and associate professors (9) fully complies with Article 55 (1) (3) of the Law on Higher Education Institutions, which stipulates that “not less than five professors and associate professors together shall participate in the implementation of the compulsory part and the limited elective part academic positions at the university concerned”.

The high qualification of the teaching staff also allows to fulfil the Regulations on the State Academic Education Standard (Part III, Items 15 and 16):

- The main aim of the Master's study programme is to provide a set of knowledge, skills and competences in accordance with the knowledge, skills and competences of level 7 of the Latvian

Framework for Education Classification;

- The content of the Master's study programme ensures the achievement of study outcomes that include the acquisition of in-depth theoretical knowledge and the development of research skills and competences in the chosen field of science or art.

The qualifications of the teaching staff contribute to the outcomes of the Master's study programme "Geology", as they are predominantly professors and associate professors of the highest qualifications. In addition, the teaching staff who specialize in various fields of geology (Quaternary geology, geomorphology, hydrogeology, engineering geology, mineral geology, sedimentology, palaeontology, etc.), as well as in other fields of science (geomatics, environmental science, mathematics, etc.) are involved in research (see Chapter 2.4 on academic staff publications, participation in conferences and participation in Latvian and international projects), which secures an opportunity to provide students with the latest scientific knowledge and up-to-date practical skills in a wide range of natural sciences. Among the assistant professors, researchers, senior researchers and lecturers, there are a number of young faculty members who may in the future replace professors and associate professors.

The results of research work are regularly used to improve the content of practically all study courses. For example, the results of the 2020/21 projects have been used in the courses "Sedimentary Environment and Processes", "Regional Geology and Geomorphology of Latvia", "Contemporary Geological Processes", "Georadar Survey in Geological Studies", etc. The results of research work and recent developments are used to plan the themes, aims, objectives and methods to be used in students' Master's thesis projects and Master's theses. On the other hand, student research is an important contributor to the development of new research ideas. Often, students' Master's theses are at least partly thematic projects.

### 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 the teaching staff has generally increased and the composition of the teaching staff has improved, as it is seen in the Table 32. Māris Krievāns and Kristaps Lamsters have been elected to the position of associate professors, and Normunds Stivriņš has been elected as professor. Assoc. prof. Ingrīda Uļjane (Faculty of Physics, Mathematics and Optometry, UL) is involved in lecturing of study courses and M. geol., PhD student Viesturs Zandersons (LU ĢZZF) is involved in conducting practical work in the field of geology of mineral resources. Experienced colleagues prof. Vitālijs Zelčs and Dr. geol. Vija Hodireva have terminated their contractual relations with the FGES of the University of Latvia, and other colleagues are now teaching the courses in their place. Prof. Vitālijs Zelčs has thoughtfully promoted the involvement of students, then PhD students and young PhD holders in teaching and research for more than 10 years, as a result prof. N. Stivriņš, assoc. prof. K. Lamsters and assoc. prof. M. Krievāns now actively participate in teaching courses and research in the field of Quaternary geology and geomorphology.

*Table 32.*

*Comparison of teaching staff composition and workload (%) in 2016 and 2021 in the MSP "Geology"**

| Academic position / Year | 2016 | 2021 |
|---|---|---|

| | | |
|---|---|---|
| Professors | 36 | 24 |
| Associated professors | 19 | 42 |
| Assistant professors | 27 | 25 |
| Leading researchers, researchers and lecturers | 18 | 9 |

*Calculated and summarised by representation of academic staff in the implementation of each study course

The renewal of the teaching staff and the increase in their qualifications have a positive impact on the quality of studies.

**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).**

The cooperation among teaching staff is generally good, which is facilitated by the simultaneous involvement of several lecturers in teaching 46% of all study courses, joint activities in attracting projects and regular discussions. The staff of the Department of Geology meets regularly at

meetings of the Department of Geology, at meetings of chairs and at Geography and Earth Sciences study field meetings to discuss curriculum quality and changes. These meetings also examine student complaints and the results of student surveys, which help to improve course content and avoid overlaps. They also consider the establishment of new projects, and the cooperation of colleagues in the submission and implementation of projects. A significant number of colleagues also collaborate on publications, joint field and laboratory work.

The courses of the programme are provided by 17 members of academic staff. However, on average (depending on the Part B courses chosen by students), 13 members of academic staff realize the study process. The number of students has varied over the last 6 years from 9-25 to 9 now. The student-teaching staff ratio is therefore 0.7 students per one lecturer now, but during the reporting period it was reaching 1.9. It should be noted that all teaching staff are also involved in teaching courses of other study programmes, mainly Bachelor’s study programmes "Geology", "Geography" and "Environmental Science" and Master’s study programme "Geography" of the University of Latvia.

# 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 | Sample of diploma and its supplements to be issued for the acquisition of the study programme Appendix 42.docx | Par studiju programmas apgūšanu izsniedzamā diploma un tā pielikumu paraugs 42. pielikums.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) | Council of Higher Education Opinion Brief Appendix 43.docx | Augstākās izglītības padomes atzinums 43. pielikums.docx |
| 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 | Statistics on students in the Master's study programme Geology Appendix 44.docx | Statistikas dati par studējošajiem maģistra studiju programmā "Ģeoloģija" 44. pielikums.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 | Compliance of the Master's study programme Geology with the State Education Standard_Appendix 45.docx | Maģistra studiju programmas Ģeoloģija atbilstība valsts izglītības standartam 45.Pielikums .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 | Course mapping of the academic study programme Geology Appendix 46.docx | Akadēmiskās maģistra studiju programmas "Ģeoloģija" studiju kursu kartējums 46. pielikums.docx |
| The curriculum of the study programme (for each type and form of the implementation of the study programme) | Plan of the Master's study programme Geology Appendix 47.docx | Maģistra studiju programmas "Ģeoloģija" plāns 47. pielikums.docx |
| Descriptions of the study courses/ modules | Course descriptions of Masters study programme Geology Appendix 48.pdf | Maģistra studiju programmas Ģeoloģija kursu apraksti 48_pielikums.pdf |
| 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) | Certification that academic staff of the academic Master study programme Geology complies with the requirements laid down in Section 55 Appendix 11.docx | Apliecinajums ĢLMS.docx |

# Geoinformatics (42442)

| | |
|---|---|
| Study field | *Geography and Earth Sciences* |
| ProcedureStudyProgram.Name | *Geoinformatics* |
| Education classification code | *42442* |
| Type of the study programme | *Professional bachelor study programme* |
| Name of the study programme director | *Arvīds* |
| Surname of the study programme director | *Ozols* |
| E-mail of the study programme director | *arvids.ozols@lu.lv* |
| Title of the study programme director | *MSc* |
| Phone of the study programme director | *26574121* |
| Goal of the study programme | *The goal of the study programme is to train highly skilled geoinformatics professionals, preparing them for competition in domestic and international labour markets* |
| Tasks of the study programme | *Objectives of the study programme are*<br>*● Provide opportunities to study theoretical and practical geoinformatics, as well as basic geography and computer science courses;*<br>*● Provide the opportunity to study in-depth professional specialisation courses related to geoinformatics;*<br>*● Develop skills related to critical thinking, analysis and reasoning;*<br>*● Develop skills in designing geographic information infrastructures and publishing geospatial master data;*<br>*● Develop independent research skills in a chosen sub-discipline of natural sciences and skills to summarise the results in a bachelor's thesis and obtain a professional bachelor's degree in geoinformatics.* |

| | |
|---|---|
| Results of the study programme | *Learning outcomes*<br>*KNOWLEDGE*<br>*1. Understand the most important concepts and regularities in the field of natural sciences (natural and human geography, remote sensing, geodesy and cartography) and geoinformatics;*<br>*2. Demonstrate typical basic and specialized knowledge in geoinformatics-related work fields, know geospatial data, standards and legal issues in the field of geoinformatics.*<br>*SKILLS*<br>*3. Perform professional activities in geoinformatics, independently obtain, formulate and analytically describe information, problems and solutions in geoinformatics, explain them and offer reasoned opinion in the discussion with both specialists and non-specialists;*<br>*4. Critically analyse geoinformatic technologies, theories and problems;*<br>*5. Demonstrate a scientific approach to problem solving, take responsibility and initiative in individual or team work, make decisions and find creative solutions in changing or uncertain circumstances.*<br>*COMPETENCE*<br>*6. Independently obtain, select and analyse information and use it, make decisions and solve problems in geoinformatics, explain them and discuss them with specialists and non-specialists; develops solutions for the practical application of technology;*<br>*7. Understand the problems and requirements of professional ethics in the field, assess the impact of their professional activity on the environment and society and participate in the development of the relevant professional field.* |
| Final examination upon the completion of the study programme | *Bachelor 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) | *Professional bachelor's degree in geoinformatics* |
| Qualification to be obtained (in english) | *Geoinformatics engineer* |

**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) | *162* |
| Admission requirements (in English) | *Secondary education. Proficiency in English as attested by the results of an international English language test equivalent to at least level B2, except where secondary education was completed in English and except where the foreigner completed their secondary education in a country of the European Union and the European Economic Area or in the Swiss Confederation and his/her evidence of secondary education includes an English language proficiency assessment equivalent to at least level B2 according to the Common European Framework of Reference for Languages.* |
| Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english) | *Professional bachelor's degree in geoinformatics* |
| Qualification to be obtained (in english) | *Geoinformatics engineer* |

**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.**

The assessment of learning outcomes following the licensing of the programme in collaboration with employers has consolidated the number of learning outcomes from 14 to 7 measurable achievements..

Changes have been made to the content of the study programme. The study course "Russian Language in Geoinformatics" has been replaced by the study course "German Language". The course “German language “ as a second foreign language will open up more job opportunities for students in the international labour market.

**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 goal of the Geography and Earth Sciences field of study is to provide an opportunity to acquire higher education in geography, geology and geoinformatics, developing research skills and strengthening practical skills needed in the labour market to produce highly qualified specialists, as well as to promote the development of science in these fields. The study programmes "Geography", "Geology" and "Geoinformatics" are the only study programmes in Latvia in these sciences, and their evaluation at the national level is closely related to the existence and development of geology and geography in the country. At the same time, the study of geography and Earth sciences is considered relevant and important in the context of the study system of the University of Latvia, as it is one of the fields of study that complement other natural science programmes, which require knowledge of geography, geomatics, climatology, geology, mineralogy, palaeontology and other Earth sciences. The goal of the study programme is to train highly skilled geoinformatics professionals, preparing them for competition in domestic and international labour markets. The objectives of the study programme are based on the set goal and are intended to ensure that the included study courses and their teaching methodology develop students' critical and creative thinking, promote their efforts to independently expand their knowledge and strengthen their practical skills, which are necessary for every highly qualified geoinformatics specialist. The study programme provides flexible, research-based and skills-enhancing studies.

The study programme is in line with the field of study "Geography and Earth Sciences". Upon graduation from the professional bachelor's study programme "Geoinformatics", graduates obtain a professional bachelor's degree in geoinformatics and engineer of geoinformatics qualification, which corresponds to an internationally recognised field of science and is relevant to the field of study.

The programme code 42442 corresponds to the regulations of the Cabinet of Ministers of June 13, 2017 no. 322 "Regulations on the classification of education in Latvia". The first two digits of the programme code (42442) indicate the level of study – Professional Bachelor's degree and 5$^{th}$ professional qualification level, while the third to fifth digits (442) correspond to the field of study – Geography and Earth Sciences. The programme code is therefore correctly designed and matches the other programme parameters.

The study programme has been developed on the basis of the Professional Standard for Geoinformatics Engineer approved by the Tripartite Cooperation Sub-Council for Professional Education and Employment of the Ministry of Education and Science at its meeting on 6 February 2019 (Minutes No 1).

The study programme is implemented in Latvian, and in the coming years it is planned to implement it in both Latvian and English, promoting the internationalisation of the study environment at the University. As the study programme is a professional bachelor's study programme, the theoretical knowledge and practical activities will enable students to successfully enter the labour market in the field of geoinformatics and geographic information systems. The lecturers involved in the implementation of the study programme carry out academic and research activities, thus ensuring the link between studies and research and promoting research-based studies.

The content of the study programme is designed to achieve the set goal in accordance with the set objectives and is in compliance with the State Standard for Second Level Professional Higher Education (Cabinet of Ministers Regulation of 26 August 2014 No 512 "Regulations on the State Standard for Second Level Professional Higher Education") and the Professional Standard for Geoinformatics Engineer. The programme's admission requirements take particular account of mathematics and English language skills, which help students achieve better results.

The admission requirements align with the study programme's aims and objectives. They are appropriate for achieving the learning outcomes, and admission is in accordance with the approved procedures and criteria. Students have the possibility to have their study courses recognised if they have completed study courses at another higher education institution or study programme, the content and credit points of which correspond to the Professional Bachelor's study programme "Geoinformatics".

The professional bachelor's study programme "Geoinformatics" has been developed in accordance with the Law on Universities of the Republic of Latvia, according to the state standard of second-level professional higher education (Regulations of the Cabinet of Ministers of August 26, 2014 No. 512 "Regulations on the state standard of second-level professional higher education") and "Geoinformatics engineer" professional standard. The professional bachelor's study programme "Geoinformatics" is designed in accordance with the principles of the Bologna Declaration, so that the obtained degree and diploma are recognized both in Latvia and on the European labour market. The goal of the study programme is to train highly skilled geoinformatics professionals, preparing them for competition in domestic and international labour markets. During the implementation and development of the study program, the principles of the Latvian Qualifications Framework (LQF) and the European Qualifications Framework (EQF) are observed. Namely, the professional bachelor's degree in geoinformatics and geoinformatics engineer's qualification provide knowledge,

skills and competences corresponding to the fifth level of Latvian professional qualification and the level sixth of the Latvian Qualification Framework (LQF) and the European Qualification Framework (EQF) and give the access to master study programmes or second-level professional higher education study programmes designed for studies after the awarding of bachelor’s degree. Graduates of the professional bachelor's study program "Geoinformatics" obtain a professional bachelor's degree in geoinformatics and the qualification of a geoinformatics engineer.

The scope of the professional bachelor's study programme "Geoinformatics" is 160 CP and its duration is 8 semesters for studies in Latvian and 162 CP for studies in English.

The study programme scope and duration comply with the State Standard of the Second Level Professional Higher Education. The duration of the studies is sufficient to achieve the planned learning outcomes.

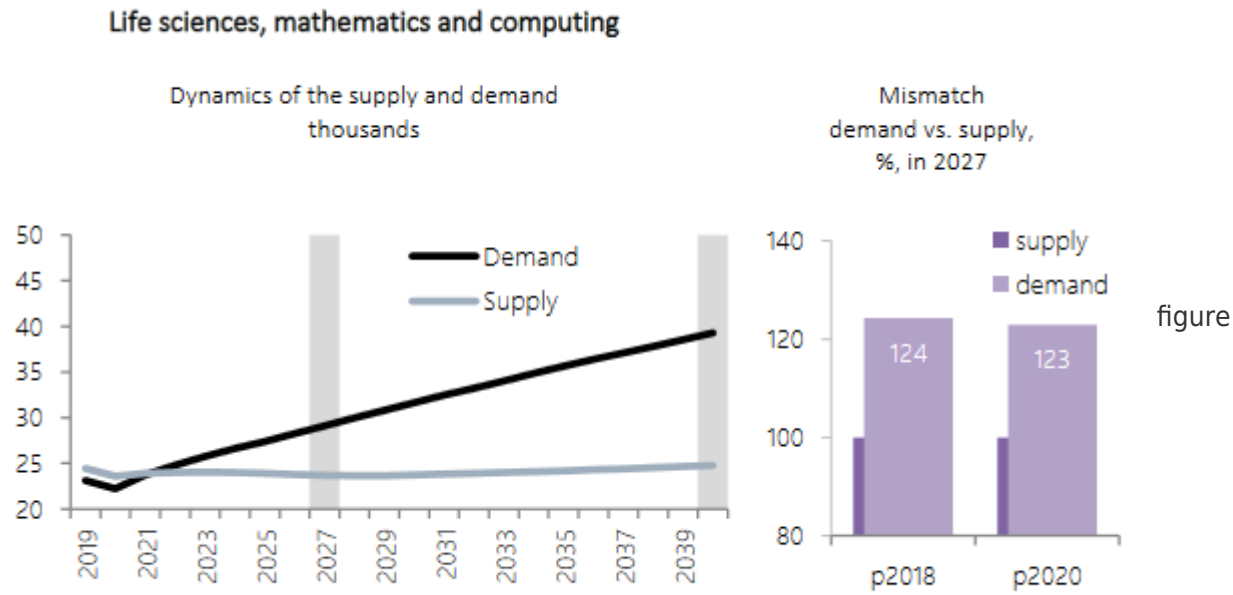
Overall, the programme's course content, degree, goal and objectives, and admission requirements are entirely consistent with each other. By fulfilling the objectives of the programme, students have achieved the goal of the programme. As a result, graduates of the programme obtain a professional Bachelor's degree in Geoinformatics and qualification of Geoinformatics Engineer, which allows them to participate in the labour market and continue their studies in the Master's programme.

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

According to the Ministry of Economy's medium- and long-term labour market projections, a shortage of higher-skilled science, ICT and engineering professionals is expected. By 2027, the shortage of higher-skilled professionals in STEM fields could grow to ~14 000[1].

Although the constraints caused by the Covid-19 pandemic have a negative impact on the current economic situation in the country, the directions for economic development set out in the country's policy planning documents point to the need to increase competitiveness and the initiatives already launched by the European Commission, including digitisation, remain in place. The demand for digital skills is also projected to increase, with 85% of all jobs in the EU expected to require at least basic digital skills by 2027.

The relevance of the Professional Bachelor's study programme "Geoinformatics" is highlighted by its link to the priorities of the "National Development Plan 2021-2027"[2], including "competitiveness and material prosperity of enterprises", "knowledge and skills for personal and national growth". The 2020 Ministry of Economy's "Information Report on Medium- and Long-term Labour Market Projections"[3] indicates that a significant labour shortage is expected in 2027 for professionals educated in engineering, science and ICT (STEM) fields. In line with labour market trends, the demand for professionals with digital skills will continue to grow.




figure

*Figure 14. Demand-supply dynamics for higher education specialists in Natural sciences, mathematics and information technology [4]*

Employers in the sector, including Arvīds Ozols (LGIA), Mārtiņš Vimba (SIA Mappost), Māris Kuzmins (AS LVM), Elza Žumbure (SIA Envirotech), Juris Griņēvičs (Rural Support Service), who participated in the development of the Geoinformatics Engineer Occupational Standard, state, the need for geoinformatics specialists who can analyse geospatial information quickly, link it with data collected from various sectors, and publish the results of analyses on the World Wide Web, thus providing access to information as a basis for many decision-making decisions, is growing. The need for specialists is also driven by the increasing importance of geospatial data in Europe (INSPIRE or Infrastructure for Spatial Information in the European Community Directive), where the conditions and process for implementing the Directive include, for example, "...the definition of implementing measures to facilitate the use of spatial data from different sources in the Member States". Those measures should be designed in such a way that spatial data sets are interoperable and Member States should ensure that any data or information necessary for interoperability is made available on terms which do not restrict its use for that purpose. The implemention rules should, to th extent possible, be based on international standards and should not impose excessive costs on Member States.[5]

Given the rapid development of the sector in Latvia and worldwide, as well as the increasing demand for high quality geospatial data, its analysis and publication on the World Wide Web, it is necessary to organise targeted professional training for specialists involved in the production, analysis and publication of this data, as required by the Geoinformatics Engineer Standard. As none of the Latvian universities produce specialists who acquire, analyse, visualise, model, transform, manage geospatial data, develop and build geospatial data structures, design geospatial data infrastructure; perform work using standard software tools and adapt them; ensure interoperability (integration) of geospatial data and systems; solve problems using a geospatial approach; work independently, in a team or under supervision[6], the PBSP "Geoinformatics" will therefore ensure the acquisition of the knowledge, skills and competences necessary for this field and its future successful application in the labour market, as well as contribute to increased competitiveness. The graduates of the new study programme will contribute to the development of geospatial information in the country to provide geospatial information processing, access and use opportunities for a wide range of society, which will ensure not only wider use of information in information systems and databases that support the operation of various emergency services, but

also in agriculture, for planning and obtaining aid payments and promoting advanced agriculture, construction, nature conservation, for faster and more accurate geodetic measurements in various fields - construction, cadastral surveying, agriculture, transport, cartography and other sectors of the economy[7].

If global trends predict such high growth in the potential labour market, then demand for specialists in STEM fields in general, as well as in this field, is also expected in Latvia (see Figure 14). The new study programme is based on the approved Professional Standard for Geoinformatics Engineers. In Latvia, such specialists are needed in dozens of companies. The experts in the development of a standard for this profession point out that in recent years GIS has been implemented or significantly developed in many companies in Latvia (e.g. Augstsprieguma tīkls, Conexus Baltic Grid, Altum, a number of forest management companies), thus creating a demand for specialists who can work with and develop these systems.

The study programme is in line with the latest trends in the field of geoinformatics in Europe and worldwide, as it covers the latest developments and research issues in the field, such as the use of open data, open technologies and new standards in the development of various geoinformatics solutions, remote sensing data processing using new methods, and the application of the results in new areas (for example, aerial laser scanning for the whole territory of Latvia is to be completed in 2020, and Copernicus and other similar projects are actively being developed).

[1] https://www.em.gov.lv/sites/em/files/labour-market-forecasts-2020-full1_0.pdf

[2] https://pkc.gov.lv/sites/default/files/inline-files/NAP2027__ENG_2.pdf

[3] https://www.em.gov.lv/sites/em/files/labour-market-forecasts-2020-full1_0.pdf

[4]https://www.em.gov.lv/sites/em/files/labour-market-forecasts-2020-full1_0.pdf p.71

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0002&from=EN

[5] Professional Standard for Geoinformatics Engineer
https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-105.pdf ( in Latvian)

[7] Information Society Development Guidelines 2014-2020 (informative part)
https://www.varam.gov.lv/sites/varam/files/content/files/is_pamatnostadnes_2013-1.pdf 53 pp. (in Latvian)

### 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.

11 students have started their studies in the academic year 2021/2022. All students studied in Latvian.

It was planned to enroll 9 students in the Professional bachelor's study programme "Geoinformatics" with state budget funds and 6 with personal financing. In 2022/2023, it is planned to admit 10 students with state budget funds and 5 with personal funding for studies in Latvian language.

**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 professional bachelor's study programme (PBSP) "Geoinformatics" has been developed in accordance with the objectives defined in the specific support objective 8.2.1 of the Operational Programme "Growth and Employment" of the project "Establishment of internationally competitive study programmes at the University of Latvia that promote the development of the Latvian economy" and based on the requirements for bachelor programmes set out in the Law of the Higher Education in Latvia[1] and the Regulations of Study Programmes and Continuing Education Programmes at the University (Senate Decision No 102, 24.04.2017.).

The code number of the PBSP "Geoinformatics" according to the Latvian Classification of Education is 42442.[2]

Students of the PBSP "Geoinformatics" will acquire knowledge, skills and competences corresponding to level 6 of the European Qualifications Framework (EQF).

According to the Regulations on the State Standard of the Second Level Professional Higher Education[3], the PBSP "Geoinformatics" has a volume of 160 CP (for studies un English 162 CP) and the study duration is four years (eight semesters, each semester students study 20 CP).

The compulsory part of the study programme includes study courses with a total volume of 60 CP, including study courses in accordance with the requirements of the Law on Civil Protection and Disaster Management and the Law on Environmental Protection, and internships with a total volume of 20 CP. The restricted electives part has a total of 62 CPs, this part includes study courses with a total of 96 CPs. In addition, there is a free elective part of six credits. At the end of the programme, students develop a bachelor's thesis of 12 CP (Annex "Course Plan of the Professional Bachelor Study Programme "Geoinformatics"").

Students choose free-choice study courses centrally by registering in the information system of the University.

The courses of study in the curriculum are organised to provide students initially with a basic

knowledge of information technology, geographical information systems and natural sciences (higher mathematics, geography, remote sensing, cartography), as well as entrepreneurship and the specialised English language. In the further study process, students acquire in-depth knowledge of various issues related to geoinformatics: human and physical geography, remote sensing, cartography, the software used, practical experience in the organisation of work in companies, as well as the legal regulation of these processes. In a limited elective part, students can choose specific examples of geoinformatics and IT applications (digital land surface models, geodesy, photogrammetry, spatial planning, spatial data analysis) or gain additional knowledge in spatial data processing, data storage and publishing. The learning outcomes of study courses are defined to ensure the achievement of the overall outcomes of the study programme in accordance with the acquired knowledge, skills and competences, which can be seen in the mapping table of study courses (Appendix  Mapping of study courses of the Professional Bachelor's study programme "Geoinformatics").

The content of the professional bachelor's study programme "Geoinformatics" is updated in line with the industry, labour market and scientific trends.

The content of the courses is continuously updated by university lecturers whose research and academic work are related to the subject matter of the course and by professionals in the field who deal with issues related to the subject matter of the course on a day-to-day basis.

For example, Doc. Jānis Karušs conducts studies of Earth’s structure by using gravity and magnetic field measurements. In the study course "Studies of the Earth’s gravity and magnetic fields," students learn data processing and interpretation methods using geophysical data obtained in scientific studies.

The study course "Geography of Latvia" uses the materials of Assoc. prof. Māris Bērziņš’s publications on the use of geospatial data in urban studies. Lecturer Arvīds Ozols introduces students to geospatial information infrastructure issues in the study course "Regulatory framework in geoinformatics".

The scientific research activities of the academic staff, participation in international scientific conferences and publication of research in scientific journals ensure compliance with scientific requirements. Updating and supplementing the course content in accordance with the development trends of geoinformatics is promoted and provided by the scientific research activity of lecturers and the targeted involvement of students in research work. Research results are regularly reported at scientific conferences, and scientific articles are prepared, including publications in international databases SCOPUS and Web of Science.

The results of the student survey were available in January 2022.

**Student surveys**. An essential element of the quality of the study process is the independent hearing of students' opinions, both in meetings during and between the learning process  and in collaborative work on the final thesis.

Students' opinions on the study programme as a whole and on specific lecturers are obtained through regular discussions with students, student surveys and questionnaires, as well as by analysing the results and discussing students' opinions.

After each course each academic year, students are required to complete a course evaluation questionnaire, the evaluation of which facilitates the programme administration in monitoring the progress and quality of the study process by providing more feedback on the quality of the study process. The overall evaluation of the course survey is available to each lecturer in LUIS and can be used for evaluation and programme improvement directly in relation to student evaluations and

recommendations. After the autumn semester of the academic year 2021/2022, the first survey data with course evaluations have been obtained; all courses are relatively highly rated, in all cases above 5.8.

After each semester and academic year, a survey of students is conducted to evaluate the programme as a whole. The results of the survey are evaluated by the Study Field Council, and the students are also introduced to the results of the survey. The overall evaluation of the course survey is available to each lecturer at LUIS and can be used for evaluation and improvement of the programme directly in connection with students' evaluations and recommendations. In general, students' assessments are considered to be constructive.

In addition to the mandatory e-surveys, it is a good practice for the programme director to discuss the semester with students at the end of each autumn and spring semester, listening to their opinions and evaluations, and then, after the discussion, asking students individually and in writing to evaluate the semester and lecturers, thus receiving a more "live" and direct evaluation. Student evaluations and suggestions are collected, analysed and taken into account in the development of the study programme and the improvement of course content. A meeting with employer representatives has been held in spring 2022 to discuss the results of the first semester of studies.

Incoming and outgoing mobility of students has not yet started during the reporting period. Applications for ERASMUS+ mobility at the FGES are centralised. Students are regularly informed about this option and the benefits are explained. To apply, students must fill in an application form, prepare for the interview in English and justify their choice of university. Students go abroad on a priority basis, based on their average grades and level of study. More than 30 ERASMUS mobility agreements have been concluded at the FGES.

[1] https://likumi.lv/ta/en/en/id/37967

[2]Latvian Classification of Education
https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju (in Latvian)

[3] Cabinet of Ministers 512 Regulations on the National Standard for Second Level Professional Higher Education (26.08.2014)

**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.

The 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 organizations are widely used. Employers are involved in the implementation and development of study courses and are invited to lead individual classes, including classes organised as experience exchange visits to workplaces.

In order 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.

Seminars are organised to improve students' speaking, presentation and discussion skills.

To aid students in achieving learning outcomes – in acquiring and consolidating knowledge, skills and competence – the study process is dominated by student-centred methods. 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. The teaching staff mainly use methods that encourage students' active participation, critical thinking and reflection. The e-learning environment is used in the study process and to promote independent studies. Each study course has an e-learning environment (Moodle) where students have access to lesson materials, 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-learning 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 teaching staff and students on the content of studies, forms and methods of organization. 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, the teaching staff use methods, examination forms and assessment criteria that are appropriate to the study goal and planned learning outcomes.

Students receive support and feedback from the teaching staff during the study process. Grading criteria for marking are made public in advance. The assessment gives students an opportunity to demonstrate the extent to which they have achieved the planned learning outcomes.

Student mobility is encouraged in line with the principles of student-centred education, study outcomes are recognised. Students participate in research initiated by the academic staff and social activities in society, thus gaining significant experience, using what has been learned 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 taken into account 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 director.

**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).**

As the study programme "Geoinformatics" is a professional study programme, the internship of students in the amount of 20 CP is an essential part of the study programme. Internship opportunities are provided in leading companies and institutions in the field of geoinformatics through agreements between the University and the internship providers. Internships in companies will provide an opportunity to consolidate the acquired theoretical knowledge and will contribute to the successful integration of students into the labour market. Foreign students will be provided with internship opportunities in English.

The aim of the internship is to improve the student's professional skills and competences in a professional environment, as well as to strengthen and supplement their knowledge; to strengthen practical skills, as well as to acquire methods of collecting, processing, analysing and systematising information in one of the sub-disciplines of geography, applied geography  (see the Regulations of the internship).

Internship objectives:

- To provide students with an insight into the activities of companies in the field of geoinformatics;

- To provide an opportunity to acquire knowledge of the legal requirements and technical regulations that must be complied with in the course of the company's work;

- To facilitate the combination of theoretical and practical knowledge in the implementation of assigned duties and tasks in the respective enterprise;

- To become familiar with the most important methods and techniques in their complex application in one of the fields of geoinformatics;

- To foster knowledge and understanding of the safety and internal rules of the undertaking concerned.

The study placement is carried out a contract basis, with the cooperation of three parties:

1. a public, municipal or private company;
2. the Faculty of Geography and Earth Sciences or the Faculty of Computer Science of the University of Latvia;
3. the student.

During the internship, students develop an individual research project and discuss it, thus demonstrating their ability to apply the acquired knowledge in scientific research and their ability to independently obtain, select, analyse, critically evaluate and use information from different sources. Through a research project, students develop analytical and critical thinking skills, a scientific approach to problem solving and demonstrate effective communication skills during project discussions. During their internship, students demonstrate their understanding of research ethics by collecting data and participating as participants in geoinformatics research.

To foster further professional development, the internships include lectures in the companies, which give students an overview of the internship's aims, objectives, process and deliverables. Students learn about the specific safety and internal rules of the company, and the specific work of professionals in their workplaces.

Before starting an internship with an enterprise, the student are familiarised with the enterprise's or institution's internal rules of procedure and safety at work, as well as with the tasks, duties and rights to be performed, as required by the enterprise or institution (with which the contract is concluded). The student shall carry out the internship in accordance with the assigned tasks and duties er, which shall be regularly recorded in the internship diary. At the end of the internship in the enterprise or institution, the student submits a report to the study programme director on the work carried out and his/her contribution to the enterprise or institution.

The student carries out the internship in two parts of 10 CP each in the $5^{th}$ and $7^{th}$ semesters (Internship I 10 CP and Internship II 10 CP). The work placement requires and enables the student to gain sufficient practical experience to ensure the development of knowledge, skills and competences in the field of geoinformatics, ensuring effective integration of theory and practice. The internship is designed to give the student an idea of what is most important in each specific placement and potential workplace, including the knowledge, skills and competences to be acquired and applied.

Students will be provided with internships by "Karšu izdevniecība Jāņa sēta" Ltd, SSC Latvijas Valsts meži, MikroKods Ltd, with which agreements have been signed, as well as students will be free to choose internships in a company of their interest related to geoinformatics.

The specific tasks of the internship are outlined in the course descriptions. The internship tasks provide for students participation in lectures, internship seminars, daily work duties at the internship site. During internship, an important task is also to plan and organise the research for the final course work or bachelor's thesis.

During internship, the interaction with the University is important, as the internship will run parallel to the study process, with students participating in lectures and internship seminars. Alongside the internship, students study the courses Regulatory Framework in Geoinformatics, Science Communication and Human Geography, which will help them integrate their knowledge in a practical work environment, as well as collect research data for Study Paper II.

Lectures and workshops will also be organised during "Internship II". The internships thus run in parallel with studies for two semesters. Alongside the internship, students will be able to choose to study Digital Terrain Models and Geomorphometry, Resources and Planning of Territorial Development, Applied Deep Learning, Nature Conservation Planning, Applied Cartography and Design. The in-depth knowledge, skills and competences acquired in internship and study courses will provide a broader perspective on the field of geoinformatics and will help to generate and compile research data for the bachelor thesis.

In the introductory lecture, the internship supervisor familiarises students with the general rules of the internship organisation, the internship organisation procedure, the internship documentation,

the content of the internship. The internship supervisor leads the internship seminars. Students prepare reports on the tasks performed in the internship, and share their experiences. Problem situations are analysed and solutions are sought to improve the work process. Student experience exchanges play an important role in internship seminars, as the student group is at the same time a mutual support and learning group and can be a valuable emotional and professional support during the study process and the start of a career.

The internship is assessed on the basis of the evaluation of the content of the student's diary, the evaluation of the internship report, the evaluation given by the internship supervisor in the enterprise or institution, and the results of the discussion on the contribution of the internship to the analysis of the overall learning outcomes.

**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 final theses of the Professional Bachelor's study programme "Geoinformatics" have not yet been elaborated.

The final thesis must be developed in accordance with the UL order “Requirements for the development and defence of final theses (bachelor, master thesis, diploma thesis and qualification theses) (UL Order No. 1/454 of 11.02.2020) and in accordance with the FGES regulations on the procedure for the development and defence of spatial planning and professional study programs for teachers ”(https://www.geo.lu.lv/studijas/studentiem/nosleguma-darbi/izstrade-un-aizstavesanas-kartiba/; approved by the FGES Board meeting on 19 March 2018. (*only in Latvian*)).

## 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 material and technical support of the University of Latvia is adequate to ensure the implementation of the study programme in the premises of the UL Academic Centre for Natural Sciences. The House of Nature is one of the most modern university buildings in the Baltics and was put into operation in 2015.

It has a total indoor area of 18 540 $m^2$, 30 classrooms, 45 student teaching laboratories and 69 research laboratories. Both Windows and Linux operating systems are available in the computer labs. Microsoft Office applications, statistical software (R, SPSS, PC-Ord), geoinformatics-specific software (ESRI ArcGIS, QGIS, PostgreSQL/postGIS, Bentley MicroStation, etc.) are available. All classrooms have a projector and laptop for presentations, and whiteboards. Interactive whiteboards are also available in some classrooms and laboratories. The large auditorium on the ground floor of the House of  Nature also has sound equipment and recording facilities.

The House of Science was commissioned in 2019. The total indoor area is 20 018 $m^2$, with a total of 15 classrooms, 8 seminar rooms, 78 scientific and teaching laboratories. Both Windows and Linux operating systems are available in the computer labs. Microsoft Office applications, statistical software (R, SPSS, PC-Ord), geoinformatics-specific software (ESRI Ar-cGIS, QGIS, PostgreSQL/postGIS, Bentley MicroStation, etc.) are available.

Both buildings have wireless network coverage. Both buildings have cafeterias, a science library and individual work cubicles. The buildings are accessible for people with reduced mobility, there are several lifts, and there are adequate sanitary facilities. The first two floors of the House of Nature are accessible to students 24 hours a day.

The University offers students and staff the opportunity to use Microsoft Office 365 ProPlus and SPSS software, as well as GIS software for a personal computer, free of charge for the duration of their studies (or employment contract).

The programme has the necessary material and technical support for successful studies:

- Academic Centre of the University of Latvia, Jelgavas iela 1: computer classrooms and geoinformatics software – at least 5 classrooms with 75 workstations available for students and teaching staff;
- At least one of the computer classrooms provides specialised training in geoinformatics IT technologies (installation of software and servers, creation of databases and their data structures, especially for geospatial data); the software is updated in cooperation with Envirotech Ltd and Mikrokods Ltd;
- The Map Browser prepared by the FGES provides extensive spatial data (topographic and thematic maps of Latvia for more than 100 years, orthophoto maps, digital terrain models, etc.) for study and research from all UL computers to all UL students and employees and from their personal computers with LANET VPN connection. The Map Browser allows quick integration of various spatial data and can be successfully supplemented during the study process;
- A wide variety of original spatial data available from manufacturers and maintainers allows real data to be used in the study process;
- The FGES is improving the range of available hardware; several drones, including a DJI Matrix600 with multispectral camera and interchangeable cameras, several real-time GPS receivers, surveying equipment (levellers, total stations);
- The Faculty of Computer Science has 5 medium-sized lecture theatres with 80-170 seats, 3 seminar rooms with 10-20 seats, 5 computer rooms with 20-35 seats, as well as staff rooms, laboratories and rooms for technical needs. The total area of the premises used for studies is approximately 2100 $m^2$;
- Classrooms and laboratories of other faculties of the University are also available, if needed.

The infrastructure of the Academic Centre for Natural Sciences allows students to stay and study in modern classrooms with interactive whiteboards and learn practical skills in spacious, well-equipped laboratories.

The courses in the study programme are created in the estudijas.lu.lv Moodle environment. There, the materials necessary for studying are regularly placed, as well as the instructions for successful course completion and daily communication between students and teaching staff. Interim tests and exams are created on Estudijas.lu.lv platform, as well as midterm grades are recorded and final course grades are calculated, which students can regularly keep track of by logging in with their student profile details.

The students of the Professional Bachelor's study programme "Geoinformatics" are provided with an appropriate information base for studying the courses and developing their final theses. The location of the Natural Sciences Library in the Academic Centre, the location of the Science Library in the adjacent House of Science, and the University of Latvia offer access to a wide range of publication databases: https://www.biblioteka.lu.lv/en/resources/subscribed-e-resources/ .

The material and technical support available for the implementation of the field of study, as discussed in Section 2.3.2, is used for the implementation of the study programme. The material and technical equipment is renewed annually using the funding of the University of Latvia, the FGES, as well as project funds.

**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 Professional Bachelor's study programme "Geoinformatics", the University of Latvia uses:

- a state budget grant from the Ministry of Education and Science, which in the academic year 2021/2022 is set at EUR 1630 for full-time studies. The sector coefficient is 1.9 and the level coefficient is 1.0, resulting in a state budget subsidy of € 3097 per student;
- tuition fee, taking into account all the factors referred to in the section "Financial support", which in the academic year 2021/2022 is set as follows:
- 2100 EUR per year for full-time studies;
- 3100 EUR for full-time international students.

Taking into account the above, the total budget of the study programme is expected to be 32 thousand EUR, per year, the data are shown in Table 33.

*Table 33*

*Estimated annual income of the programme, EUR*

| Type of study | Number of students | Tuition fee/state grant | Total income |
|---|---|---|---|
| FTS (budget) | 9 | 3097 | 27 873 |
| FTS (fee) | 2 | 2100 | 4 200 |
| International students | 0 | 3100 | 0 |
| **Total** | | | **32 073** |

**Programme costs**

In order to estimate the amount of funds required for financial provision, the cost of study programmes at the University of Latvia is calculated according to the methodology developed by the University of Latvia, which takes into account the costs of providing the study process and information on the study programme plan, reliability of forecasts.

**The full-time study programme costs**

For calculations, the implementers of the study programme “Geoinformatics” use students data of the academic year 2020/2021 – 11 students study in the programme at the FTS, according to the curriculum plan licensed on 4 August 2021 and the existing structure of the involved academic staff. Taking into account the above, the estimated cost per full-time student of the program is 3026 EUR per year, and the total cost of the program is 33 286 per year. A more detailed percentage cost breakdown is shown in Table 34.

*Table 34*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 48.4% |
| General staff | 8.5% |
| Other payments | 6.0% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |

| | |
|---|---|
| **TOTAL COST** | **100.0%** |

Figure 15 shows the cost of the study programme depending on the number of students and a comparison with the offered tuition fee and the state budget grant.

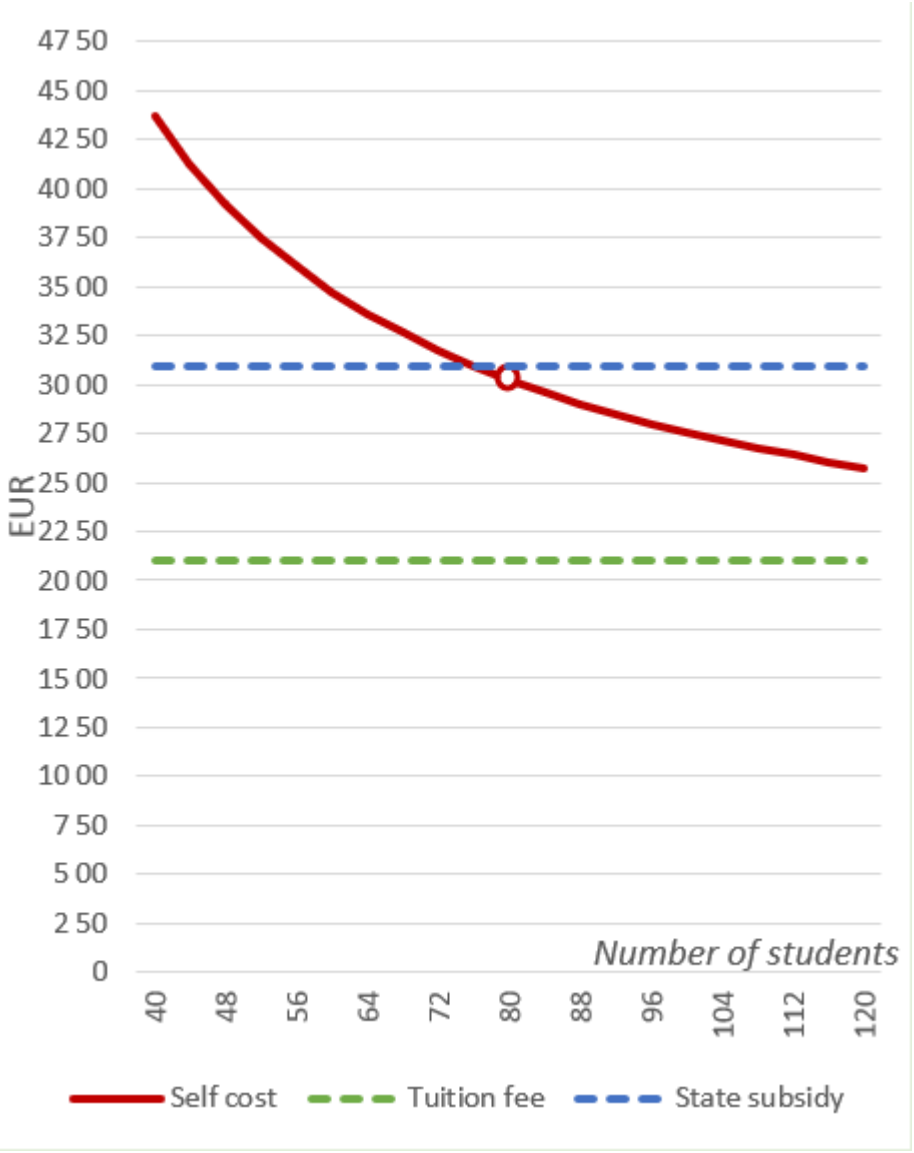



Figure 15. Cost per full -time student enrolled for the PBSP “Geoinformatics”

Based on the calculation, it can be seen that for the programme to be profitable and provide students with a quality study process, the number of students in the programme (all courses combined) should be enrolled more than 80 (intersection of red (cost) and blue (state subsidy) lines projected on the x-axis).

**Summary of the revenue and expenditure of the programme**

Table 35 summarizes the programme revenue based on the number of students, state grants and tuition fees, and the programme expenses for such number of students.

*Table 35*

The result of the programme

| Type of study | Number of students | Tuition fees/state subsidy | Income | Cost |
|---|---|---|---|---|
| FTS (budget) | 60 | 3097 | 185 820 | 185 290 |
| FTS (fee) | 20 | 2100 | 42 000 | 58 560 |
| **Total** | | | 227 820 | 236772 |

**The study programme costs for international students**

The estimated self cost based on above mentioned calculations per international student of the program is 3107 EUR per year,

*Table 36*

*Percentage breakdown of costs in the study programme*

| **Expenditure item** | **% of total** |
|---|---|
| Teaching staff | 46.7% |
| General staff | 8.2% |
| Other payments | 8.0% |
| Infrastructure expenditure | 9.1% |
| Property and services | 2.0% |
| Indirect costs | 26.0% |
| **TOTAL COST** | **100.0%** |

**Summary of the revenue and expenditure of the programme for international students**

Table 37 shows the programme's income and expenditure based on the number of international students and tuition fees.

*Table 37*

The result of the programme

| Type of study | Number of students | Tuition fees/state subsidy | Income | Cost |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| International students | 60 | 3100 | 186 000 | 199 800 |

To be cost-effective and to provide students with a high-quality study process, the programme should have at least 60 international students enrolled.

The data in the tables above show that the programme needs to increase the number of students, start enrolling international students and revise tuition fees in the coming years to ensure income. Until a positive result is achieved, the programme can be additionally financed from income received from lifelong learning and other services and from the financial resources accumulated by the unit. Faculties also receive financial support for the development of programmes from the UL Study Quality Improvement Fund.

The study and research base, informative and material-technical base correspond to the specifics of the professional bachelor’s study programme "Geoinformatics", conditions of implementation, create preconditions for the achievement of learning outcomes and indicate the possibility to ensure a qualitative study process.

## 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 Professional Bachelor's study programme "Geoinformatics" involves 33 teaching staff, including 7 professors, 9 associate professors, 9 assistant professors, 7 researchers, as well as one industry professional.

Of the teaching staff involved in the study programme, 28 have doctoral degrees, 4 master's degrees and 1 professional master's degree, which indicates that the teaching staff with the appropriate qualifications have been selected according to the specific nature of the course being taught. This ensures that the objectives and learning outcomes of the study programme and the corresponding study courses are achieved.

The English language skills of the teaching staff involved in the implementation of the study programme allow them to teach study courses in English.

The number of teaching staff and their qualifications confirm that the study programme has the number of teaching staff with the appropriate qualifications for the implementation of the programme as stipulated by the regulatory enactments.

According to the information available in the Web of Science and Scopus databases, the teaching staff involved in the implementation of the study programme have indexed more than 200 scientific publications in the period from 2016 to 2021 (the list of publications of each of the staff members in

the last six years is attached in the Annex).

When evaluating the use of research results in the study process, it should be noted that the findings of scientific research and current information obtained at international conferences are regularly reflected in lecture materials and discussed with students in seminars and practical classes. It allows to improve the content of the study courses and provides better communication with students, helps to achieve a deeper understanding of theoretical knowledge, promotes the acquisition of research methods and the skills to apply them. Research activities of academic staff, participation in the development of international and Latvian Council of Science (LCS) funded projects directly and positively influence the study process, for example, the results of the EU HORIZON 2020 programme project "Towards climate-smart sustainable management of agricultural soils" are used in the study course "Fundamentals of Physical Geography", the NRP project "Latvian Heritage and Future Challenges for the Sustainability of the Country" "Towards sustainable development and inclusive society in Latvia: response to demographic and migration challenges" (DemoMig) results have been used in the study courses "Applied GIS II (Human and Society)", "Human Geography", LCS project findings in the study courses "Geography of Latvia", "Modelling basics", "Photogrammetry, LiDAR and UAV", "Studies of the Earth Gravity and Magnetic Fields".

A list of the staff involved in the implementation of the study programme is attached in the Annex, indicating the academic degree and position of the faculty member, as well as the study courses implemented.

The University of Latvia takes targeted measures to ensure that changes in the composition of its staff do not adversely affect the quality of study programme implementation and compliance of the study programme with the regulatory enactments. This is ensured by the staff recruitment policy and continuing education of teaching staff.

The qualification of teaching staff, which helps to achieve learning outcomes, is reflected in the activities carried out within the project No 8.2.2.0/18/A/010 "Renewal and Competence Development of Academic Staff at the University of Latvia" for 2019-2021. The teaching staff of the Professional Bachelor's degree programme "Geoinformatics" have had their qualifications upgraded through further education.

The course "English Language" (216 hours), which has been attended and the certificate (in most cases for the highest, i.e., C1 level) has been obtained by the lecturers E. Apsīte-Beriņa, M. Bērziņš, A. Dēliņa, L. Kalniņa, G. Kalvāne, R. Kasparinskis, Z. R. Krišjāne, A. Markots, J. Paiders, Z. Penēze, S. Rūsiņa, Ģ. Stinkulis, I. Strautnieks, I. Šteinberga, J. Zuters. Seven more staff members have started and are continuing their studies in the academic year 2021/2022. This will allow for better quality teaching of study courses in English and will contribute to the internationalisation of the programme.

The 36-hour training course "Development of Academic Staff Competences in the Field of Leadership" has been attended and certificates have been awarded to E. Apsīte-Beriņa, M. Bērziņš, J. Karušs, Z. Krišjāne, I. Kukuļs, J. Lapinskis, Z. J. Peneze, S. Rūsiņa, I. Šteinberga.

The 36-hour course "Development of Digital Skills of Academic Staff" was attended by E. Apsīte-Beriņa, M. Bērziņš, L. Dobkeviča, G. Kalvāne, Z. Krišjāne, J. Lapinskis, Z. N. Stivriņš, J. Ventiņš. In addition, E. Apsīte-Beriņa, I. Strautnieks have acquired new knowledge regarding the use of the Moodle system. It is important to note that this course "E-environment Moodle. Practical recommendations in e-environment" has been developed and taught by one of the lecturers of this study programme, assoc. prof. I. Šteinberga.

The training course "Digital Media Literacy (24 hours)" was attended by lecturers E. Apsīte-Beriņa, I. Grīne, Z. E. Peneze, I. Šteinberga. The 16-hour refresher course "Public Speaking, the Art of

Speaking and the Basics of Presenting to Industry and Audiences" was attended by Z. Krišjāne and Z. A. Briede, J. Karušs, A. Markots. M. Bērziņš attended the 32-hour refresher course "Scientific Activity and Publication Skills".

Continuing education of lecturers significantly improved their digital skills, work in the Moodle environment and pedagogical skills. This generally increases the quality of study work, ensures the achievement of learning outcomes.

The project No 8.2.2.0/18/A/010 "Renewal and Competence Development of Academic Staff at the University of Latvia" still involves the doctoral students H. Ījabs and J. Krūmiņš, who continue their work and are preparing for the defence of their doctoral theses. This ensures the renewal of the academic staff.

The professional development and renewal of the teaching staff of the Professional Bachelor's study programme "Geoinformatics" is positively assessed and is directed towards the acquisition of versatile, modern and high-quality higher education.

**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.**

The Professional Bachelor's degree programme "Geoinformatics" started in the autumn semester of the academic year 2021/2022 and there have been no changes.

**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).**

The teaching staff of the Professional Bachelor's study programme "Geoinformatics" in the academic year 2021/2022 consists of 33 faculty members. There are currently 11 students registered in the programme. In the first year of study 9 lecturers are involved in the study process.

Study issues are periodically discussed in the Study Field Council, and there is a mechanism for inter-staff cooperation to facilitate the development of study courses and curricula of the study programme.

The cooperation among teaching staff is generally good. The staff meets regularly at meetings, for example at the Department of Geography, at meetings of chairs and at Geography and Earth Sciences Study Field meetings where issues of curriculum quality and changes are discussed. These meetings also consider student complaints and student survey results, which help improve course content and avoid overlaps.

Mutual dialogue between the teaching staff and students involved in implementing the Professional Bachelor's study programme "Geoinformatics" on the need for improvement or changes in the organisation of the study process is organised through the Study Field Council..

The cooperation of teaching staff is also facilitated by the programme and faculty management, who regularly discuss and coordinate the study process through meetings and/or electronic communication with lecturers. Study issues are discussed in individual conversations and periodically reviewed by the Study Field Council..

The main responsibility of the teaching staff is to ensure up-to-date and modern content of study courses, adapting them to new requirements and trends, which is done using the Moodle environment estudijas.lu.lv. The quality of course descriptions is maintained by adhering to professional standards in the development of all course descriptions and by being aware of the importance of the information contained therein in ensuring a quality study process. The teaching staff follow the principles of student-centred education, while being aware of the orientation of the professional study programme and the need to motivate and prepare students for professional activity. Cooperation with employers (some of them are also teaching staff) is ongoing to improve the content of study courses in line with employers' perspectives.

Significant changes in the mechanisms of faculty collaboration have taken place with the remote learning due to the COVID-19 pandemic. During this period, teaching staff and students have shown high adaptability. The biggest changes have been in changing previous patterns of action, such as adapting lectures quickly, adapting materials for synchronous and asynchronous learning, adapting to the demands of technologies. As a result of students' initiative, during this period the teaching staff created lecture recordings, improved materials and video lectures, and added additional interactive learning tools.

Collegiality issues have also been important for the practical delivery of lectures during this period. Particularly challenging have been situations where staff have had to adapt to delivering lectures and practical work in a combined or hybrid format. These are determined by the situations when the lecturer is working in the classroom in person, while some students log in remotely. Overall, the

adaptability of the teaching staff is considered to be very high. In situations where process improvement measures have been necessary, this has been done in cooperation between the teaching staff, students and the programme director and faculty management.

# 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 | Sample of diploma and its supplements to be issued for the acquisition of the study programme Appendix 49.docx | Par studiju programmas apgūšanu izsniedzamā diploma un tā pielikumu paraugs 49 pielikums.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 | Statistics on students enrolled in the study programme .docx | Statistikas dati par studējošajiem studiju programmā.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 | Compliance of the Professional Bachelor's Study Programme Geoinformatics with the State Standard of Second Level Professional Higher EducationAppendix 50-1-1.docx | Profesionālās bakalaura studiju programmas "Geoinformātika" atbilstība otrā līmeņa profesionālās augstākās izglītības valsts standartam 50. pielikums-2-2-1.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 professional bachelor's study programme Geoinformatics with the professional standard Appendix 51.docx | Profesionālās bakalaura studiju programmas "Geoinformātika" atbilstība profesijas standartam 51 pielikums.docx |
| 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 | Course mapping of the Professional Bachelor's study programme Geoinformatics Appendix 55.docx | Profesionālās bakalaura studiju programmas "Geoinformātika" kursu kartējums 55 pielikums.docx |
| The curriculum of the study programme (for each type and form of the implementation of the study programme) | Plan of the professional Bachelor's study programme Geoinformatics Appendix 52.docx | Profesionālās bakalaura studiju programmas "Geoinformātika" plāns 52 pielikums.docx |
| Descriptions of the study courses/ modules | 02_ENG_Geoinformatika kursu course descriptions.pdf | 02_LV_Geoinformatika kursu apraksti.pdf |
| Description of the organisation of the internship of the students (if applicable) | Regulations regarding the study placement of the professional bachelor's study programme Geoinformatics Appendix 54.docx | Profesionālās bakalaura studiju programmas "Geoinformātika" studiju prakses nolikums 54 pielikums.docx |
| 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) | | |