



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT
STUDY FIELD of GEOLOGY
at Vilnius University

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Study Field Data

Title of the study programme	<i>Geology</i>	<i>Geology</i>
State code	6121CX008	6211CX009
Type of studies	University studies	University studies
Cycle of studies	First	Second
Mode of study and duration (in years)	Full-time studies, 4 years	Full-time studies, 2 years
Credit volume	240	120
Qualification degree and (or) professional qualification	Bachelor of Physical Sciences. Study field: Geology	Master of Physical Sciences. Study field: Geology
Language of instruction	Lithuanian	English, Lithuanian
Minimum education required	Secondary education	Bachelor degree
Registration date of the study programme	20-06-2014	19-05-1997

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I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluations of study fields in Lithuanian Higher Education Institutions (HEIs) are based on the Procedure for the External Evaluation and Accreditation of Studies, Evaluation Areas and Indicators, approved by the Minister of Education, Science and Sport on 17 July 2019, Order No. V-835, and are carried out according to the procedure outlined in the Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC) on 31 December 2019, Order [No. V-149](#).

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

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

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

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

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

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

1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure as approved by the Director of SKVC on 31 December 2019, [Order No. V-149](#). The site visit to the HEI was conducted by the expert panel on 11th of November, 2022.

Prof. dr. Alvar Soesoo (panel chairperson) *Professor of the Institute of Geology, Tallinn University of Technology, Visiting Professor of the Institute of Ecology and Earth Sciences, Tartu University, Estonia;*

Prof. Dr. hab. Edyta Kalińska, *Associate Professor, Faculty of Earth Sciences and Spatial Management, Nicolaus Copernicus University in Toruń, Poland;*

Dr. Anicetas Štuopis, *hydrogeologist at the company “GROTA”, Lithuania;*

Ms Rūta Tamanauskaitė, *first-year student of the master's program Marine Hydrology at Klaipėda University.*

1.3. GENERAL INFORMATION

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

No.	Name of the document
1.	List of working loads of the Staff
2.	Student numbers and graduation percentages of the 1st and 2nd cycles
...	

1.4. BACKGROUND OF GEOLOGY *FIELD STUDIES* AT VILNIUS UNIVERSITY

Vilnius University, established in 1579, is the oldest and largest higher education institution in Lithuania. As on October 1st 2021, there were 5317 employees at the University - of which 2424 were teaching staff, 804 were research staff and 2089 were administrative staff. The number of students was 23 374. The University has 15 core academic units including 11 faculties, 1 institute, 1 centre, 1 academy and 1 business school and 12 core non-academic units. Vilnius University offers undergraduate, graduate and postgraduate studies in the fields of humanities, social sciences, natural sciences, medical and healthcare sciences, and technological sciences. Under the Faculty of Chemistry and Geosciences, there are two institutes: Institute of Chemistry and Institute of Geosciences. The Institute of Geosciences comprises departments of Geography and Land Management, Geology and Mineralogy, Hydrogeology and Engineering Geology, Hydrology and Climatology, and Cartography and Geoinformatics.

In the evaluated study field - Geology undergraduate (1st cycle) and Geology graduate (2nd cycle) study programmes are operated. Doctoral studies in Natural Sciences are operated in cooperation with the Nature Research Centre. The Department of Geology (Geology-mineralogy) was founded 210 years ago. In 2012, the decision was made to prepare an updated first-cycle Geology study programme, where students can choose their speciality between "Geology" and "Hydrogeology and Engineering Geology". This new first-cycle study programme "Geology" was registered in 2014. The first-cycle programme is designed for 4 years (240 ECTS), while the second-cycle programme lasts two years (120 ECTS). Vilnius University is the only university in Lithuania providing the Geology Programme. Today the second-cycle study programme is taught in English and Lithuanian, while the first-cycle programme is taught in Lithuanian.

The last external evaluation of the Geology programme (Geology Master Programme) was conducted in 2014. The panel made seven general recommendations. The total score of the six evaluation areas was 19 (out of 24). It was concluded that the programme did meet educational and specific national and international requirements, was sustainable, and the programme was accredited positively (accredited for 6 years).

II. GENERAL ASSESSMENT

Geology study field and *first cycle* at Vilnius University is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	4
3.	Student admission and support	4
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Study quality management and public information	3
	Total:	27

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

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

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

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

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

Geology study field and second cycle at Vilnius University is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

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

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

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

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

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

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

III. STUDY FIELD ANALYSIS

3.1. INTENDED AND ACHIEVED LEARNING OUTCOMES AND CURRICULUM

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

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

The main aim of the Geology study field is provided in the Appendix 1 and is “to train highly-qualified, motivated, independent and innovative-thinking specialists who are able to perform geology-based or related research work in both national and international companies, institutions, and education authorities”. Further, the companies and institutions are referred to “...those who are qualified to apply the modern knowledge about the Earth as a unified system, as well as its structure, composition, geological processes and their development, underground resources as well as their rational use and conservation; those who are able to use their hydrogeology and engineering geology knowledge for the rational use of water resources, construction development and their geological condition assessment, are interested in geology problems, pursuing a higher qualification, and those who are able to maintain professional competence through life-long learning”.

Following the SER, the graduates of both study programmes can work in (1) the private enterprises related with geophysical, geotechnical, eco-geological, hydrogeological, gemmological research, engineering geology, oil production, (2) the public enterprises such as Lithuanian Geological Survey, the Ministry of Environment, municipalities, and public energy enterprises, and (3) educational and managerial enterprises related with the scientific and geological research, environmental research, environmental state assessment, managing the use and conservation of underground and other natural resources, and territorial planning.

The aim and study programme at the Geology are in line with the needs of society and labour market. Within the upcoming years there is a large need for geologists in Lithuania, but a rather limited number of graduates, which results in a shortage of the geology-related workers. The study programmes are constructed in a way to provide a good graduates' knowledge to utilise

it in their future jobs. However, an additional training as provided by the potential employers are crucial while employing the graduates.

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

The mission of Vilnius University is “to create, accumulate and disseminate knowledge by ensuring continuity of authentic university culture distinguished by the atmosphere where old traditions and new ideas enrich each other”. (Vilnius University webpage: https://www.vu.lt/site_files/InfS/Leidiniai/VU_reprezentacinis_EN.pdf)

The Geology programme prepares highly-qualified universal geologists professionals, whose intellectual and practical skills well match the requirements of modern Geosciences and knowledge-based technologies, demonstrating comprehensive geological knowledge and understanding, and who are able to effectively apply it in scientific investigations and practical activities, and considering this, it is in a line with the university mission by matching the old traditions with new technologies.

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

The Geology field study programmes are in accordance with the Lithuanian Qualifications Framework, the Description of General Requirements for the Provision of Studies, the Descriptor of Study Cycles, the Geology study field descriptor approved by Order No. V-811 of the Minister of Education and Science of the Republic of Lithuania of 23 July 2015 and Vilnius University Study Programme Regulations.

General requirements for the first and second cycle study programmes are presented in Table No. 1 and Table No. 2, respectively.

Table No. 1 Geology study programme’s compliance to general requirements for first-cycle studies

Criteria	General legal requirements	In the Programmes
Scope of the programme in ECTS	180, 210 or 240 ECTS	240 ECTS

ECTS for the study field	No less than 120 ECTS	210 ECTS
ECTS for studies specified by College or optional studies	No more than 120 ECTS	30 ECTS
ECTS for fieldworks	No less than 15 ECTS	25 ECTS
ECTS for final thesis (project)	No less than 15 ECTS	15 ECTS
Contact hours	No less than 20 % of learning	~41.63%
Individual learning	25-30 student work hours that represent one study credit	26.375 hours on average: one ECTS

Table No. 2 Geology study programme's compliance to general requirements for second-cycle studies

Criteria	General legal requirements	In the Programmes
Scope of the programme in ECTS	90 or 120 ECTS	120 ECTS
ECTS for the study field	No less than 120 ECTS	120 ECTS
ECTS for studies specified by University or optional studies	No less than 60 ECTS	120 ECTS
ECTS for university-determined or elective subjects	No more than 30 ECTS	30 ECTS
ECTS for final thesis (project)	No less than 30 ECTS	30 ECTS split into parts of 10 and 20
Contact hours	No less than 10 % of learning	~27.57%
Individual learning	25-30 student work hours that represent one study credit	~26.3 hours on average: 1 ECTS

Both the first- and second-cycle of the Geology study programmes comply with the legal

requirements. It is clear that the programme includes the highest values of the legal requirements, therefore this is beneficial for students.

The aims of the programme (section 1.2. in SER and in Appendix 1) comply with the Descriptor of the Study Field of Geology (Order No. V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022 and Vilnius University Study Programme Regulations). The intended learning outcomes of the programmes (section 1.2. in SER and Appendix 1) comply with the learning outcomes stated in the General and Special Outcomes in the Descriptor of the Study Field of Geology (Order No. V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022 and Vilnius University Study Programme Regulations). The curriculum design and course modules comply with the requirements on programme structure and implementation of study programmes as stated in Description of Study Cycles (Order No. V-1012 of the Minister of Education and Science of the Republic of Lithuania, 2016).

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

Teaching and learning activities and assessment methods are regulated by the Descriptor of the Study Field of Geology (Order No V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022). Several teaching and learning activities can be found in the Geology programme as lectures, practicals (fieldworks) and some other methods of a traditional learning concept, laboratory tests, team learning, e-learning courses of the subjects, portals of teaching materials, products of video lectures.

A wide range of assessment methods is used: written and oral examination, course credit, test, practical training report and its defence, final thesis and its defence, colloquium, individual or group project report, course work, collegial assessment of a research work. Assessment might be cumulative (interim test), collegial when students are examined by a competent Commission of geoscientists–academics, professional practitioners, representatives of social partners and diagnostic, which are carried out in order to ascertain the student’s achievements and progress made at the end of the studies of a subject or part of the course.

The teaching/learning activities and assessment methods used at the Geology programme of the first- and second-cycle comply with the regulations in the Descriptor of the Study Field of Geology (Order No V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022).

The intended learning outcomes (SER) are addressed by using different assessment methods as the examination (written or/and oral), the cumulative assessment and pass (Appendix 2). Study methods and assessment methods are chosen by teachers, and this allows measuring the compliance of achievements with specific study programme results at their discretion. The assessment methods are carefully linked with the subject modules (Appendix 3).

Programme modules are usually assessed by the cumulative assessments and passes, for example by a combination of several intermediate colloquiums/assessments, reports and the final exam. Optional study modules usually end with the examination by a final test or an exam. Some modules focus on the final presentations which ensures the practice in public speaking.

Students are exposed to a number of field courses during their education, for example Introductory to the Quaternary Geology, Geological Mapping and Geophysics and Stratigraphy and Facies Recognition. This is a very important experience for future geology professionals.

In general, the teaching and learning activities of the subject modules comply with the desired learning outcomes, and the assessment methods are appropriate. Nevertheless, in some periods (especially when the bachelor thesis needs to be prepared), students feel overloaded with their hours.

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

The intended learning outcomes of the Geology programme of the first-cycle (as stated in the SER) are mostly about ability to communicate in spoken and written Lithuanian and using the sources in English, work both independently and in a team, study literature and various source of data, present information to the audience, use information technology and proper terminology along with knowing the Earth's structure, geological formation, and composition, evaluate the current geological phenomena, explain the peculiarities of the underground water and soil structure, carry out geological outdoor research and cartography with analysing the

specific geology field problems, explain the geologic and engineering geologic conditions of Lithuania and the Baltic region and to evaluate the underground water resources.

The intended learning outcomes of the Geology programme of the second-cycle are mostly about the ability to work autonomously and in teams and use various information and technology to solve the tasks. Among the geological-wise outcomes, there are several understandings listed, as for example the structure, composition and evolution of the Earth as a global system, the interaction of the deep and surface processes of the Earth, on paleontological research methods of Quaternary and pre-Quaternary sediments, the methodology for assessment of the mineral and hydrocarbon resources, processes of glaciations, structure and composition, formation of the Quaternary sediments of NW Europe, the modern geological problems and hypotheses, quantitative and qualitative methods, and methods of the interaction of geological processes and geological environment, a compilation of maps, cross-sections, diagrams and scientific literature, geological field investigations and mapping, techniques for the study of sedimentary rocks, modern analytical and mathematical modelling techniques, natural resources and the resources and dynamics of groundwater.

The intended learning outcomes of the Geology programmes of the first- and second-cycles comply with the general and special learning outcomes as stated in the Descriptor of the study field of Geology (Order no. V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022).

According to the site-visit, the second-cycle Geology programme lacks the bridging courses, which help students with no geology background to get easier into the programme.

The Geology programme at VU has a strong focus on the field courses, which allow the student to work both independently and, in a team, as well as develop their professional skills, and social and personal competences (as pointed out by SER, p. 35). During the on-site visit, both the students and the teachers agreed that a share of field courses in the Geology programme is sufficient. However, the social partners would increase their number to ensure the students' practical skills.

Importantly, not all students from the Geology programme are sufficiently exposed to the offers of the social partners, although meeting with the representatives from the local geological companies is possible during the studies.

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

The Geology programme of the first-cycle consists of 90.5% of mandatory course modules (190 out of 210 of ECTS). The students can choose between the Geology and Hydrology and Engineering Geology specialisations.

The Geology programme of the second-cycle consists of 75% of mandatory course modules (90 out of 120 ECTS). After the first year of study students can choose between the Geology and Hydrology and Engineering Geology specialisations.

Students carry an opportunity to personalise their study programme. This can be achieved in several ways, for example by choosing an individual study plan, participating in academic exchange (partial study periods, fieldwork), studying various foreign languages, the minor studies, which are available for the students of the first-cycle studies. Additionally students of both the first- and the second-cycle have a choice of their speciality and the elective subjects, which are complementary with the chosen speciality. Choices of the second-cycle students are greater than the first-cycle ones.

Education personalising can be further achieved by choosing a topic for their M.Sc. thesis project as well as some course modules, for example Environments of the Quaternary Interglacials, Scientific research project, Engineering Hydrogeology, Geophysical methods and data interpretation.

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

The procedure for the preparation and defence of the final thesis is regulated by directives from VU and approved methodological instructions for the students of the Geology and Hydrogeology and Engineering Geology departments. The bachelor's degree final project (15

ECTS) is conducted during the 8th semester, whereas the master's degree final project (20 ECTS) is conducted in the 4th semester.

Students choose the topics from the list prepared by the field experts, but they also have an option to suggest their own topics as long as it's arranged with the study programme committee and their thesis supervisor.

Social partners actively participate in the final theses both at the bachelor and master level by their supervising, participating in the final theses evaluation committee and reviewing. Providing free access to their laboratories and the financial support is an asset.

The procedure for the final thesis preparation and defence complies with the requirements in Descriptor of the Study field of Geology (Order No V-924 of the Minister of Education and Science of the Republic of Lithuania of 7 June 2022). The topics of the thesis projects are relevant for the field of study.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The Geology study programme of the first cycle has a lot more credits dedicated for the study field than listed in the legal requirements (no less than 120), which is beneficial for the students.
2. Both students and teaching staff are satisfied with the amount of practicals in the study programmes.

(2) Weaknesses:

1. There is no sufficient exposure of students from both programmes to the offers of the social partners
2. There is a need for more practicals for the students as stated by the social partners.
3. There is an overload of hours to the first-cycle students, which should be revised or changed.
4. There is a lack of the bridging courses at the second-cycle programme, which are crucial for students without geological background.

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDIES

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

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

According to SER (p. 17) the teaching staff of the Geology study programme presently perform scientific research of a high level and present research results in peer reviewed journals. During the period 2018-2021, the staff have published 62 peer-reviewed research articles, 40 out of which are included into the database of Web of Science (WoS). Many of these articles are written in collaboration with international partners. This demonstrates international collaboration. It should be also mentioned that the Vilnius University Rector prize for exceptional scientific achievements in 2020 was given to one professor, and in 2021 — to another professor, both are teachers at the Department of Geology. A fundamental accomplishment in publishing – the research publication in journal Nature (the world leading journal in natural and life sciences) – was achieved by Prof. A. S. in summer of 2022 (<https://doi.org/10.1038/s41586-022-04867-y>).

A national comparative R&D evaluation was performed in 2018 by the Research and Higher Education Monitoring and Analysis Centre (MOSTA) (current name STRATA) for the period of 2013–2017. The experts evaluated the research according to the following criteria: (1) quality of the activity, (2) the economic and social impact of the activity, and (3) the potential of activity development. Each criterion was evaluated by the experts in the 5-point scale. The expert group report and recommendations are presented in STRATA website <https://strata.gov.lt/palyginamasis-ekspertinis-mtep-vertinimas/rezultatai/>. The research activity level of Vilnius University Geology study field at the national level was evaluated satisfactorily (2 from 5). The expert team mentioned several deficiencies, namely “The collaboration at national level is not evident, which is surprising as the geoscience unit at the National Research Centre performs similar research. The group publishes articles in various journals, but their level, based on citation indicators, is not high.”

At present, the expert panel points on several positive tendencies such in research quality increase and publishing during the evaluated period. These improvements are evident while evaluating publication records for a few last years: for example, the number and quality of

international publications of the high rank journals has increased; in 2019 the number of articles in peer-reviewed journals grew by 54%, and the number of publications in Web of Science journals increased 53%. However, in 2020 the number of publications somewhat decreased, but was still higher (by 47%) than that in 2018. This shows that the recommendations by the comparative R&D evaluation team (2018), but also the suggestions by the earlier Programme evaluation team (2014) have been taken seriously.

It needs to be stressed that there are staff members publishing in excellent journals annually, but the average publication number per researcher is still low. Taking 62 publications within four years (2018-2021), it will give an average of 0,62 publications per staff member (25 staff members in the calculation) annually. In WoS journals the average number is 0,4 per person/year! These averages are low and there is some space for improvement. No textbooks published in the years of 2018-2021.

Several cooperation partners are listed in the SER, including international partners from University of Tartu (Estonia), Institute of Hydrogeology and Engineering Geology at University of Warsaw, Polish Geological Institute, University of Wroclaw, University of Gdansk (Poland), Silesian University of Technology (Poland), Institute for Geology and Geochemistry of Petroleum and Coal at RWTH Aachen University (Germany), University of Latvia, Lund University and Uppsala University (Sweden). National research partners are related to The Nature Research Centre, Lithuanian Geological Survey, companies such as UAB Geonafta, Minijos nafta and Geobaltic.

It can be concluded that the level of scientific research in the field is sufficient, and it supports the teaching process. However, there is space for improving publications quality (by publishing more articles in the world leading journals), and by increasing the annual number of publications. International cooperation is on a good level and likely supporting the improvement of research at VU.

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

According to the SER (p. 19), the teaching staff integrates their individual and international modern research results into the courses they taught. This was well demonstrated during the site visit by several staff members. The results of research are also shared among other staff

members to ensure that the knowledge and competence development of students is based on the latest research developments and methods. Appropriate scientific or applied science articles are suggested for students and there are seminars on 2nd cycle to discuss and assess those new findings. The teachers mentioned that some of the data collected during the fieldwork or field excursions are integrated into study modules, and teachers can use it as practical examples for their teaching.

For instance, in the course “Sedimentary rock petrography”, “Sedimentology”, and “Ice geology”, the latest outdoor study results of the course professor are presented in the student's laboratory and practical work. The research of one PhD student on the Varėna iron ore deposit is presented in the lectures of the “General geology”. In addition, the recent research on Mars and about the NASA Voyager project is used in the same course. In the course “Geology and tectonics of the Baltic region” new data on the Lithuanian crystalline basement as well as distance and direct research methods are used. Another professor's collections, rock samples, thin-sections and geochemical analyses are directly used in detail in the courses of “Applied Petrology ” and “Rock investigation methods”. In the second-cycle subject “Paleontological method geology”, the samples analysed by the course professor have been used and the students have presented their class-room research results based on these samples. It has been mentioned that researcher integrates the results of her scientific research on the modelling of the oil system in the Baltic Sea area into the subject of “Oil and gas geology”. In the “Sequence stratigraphy” (2nd cycle) the examples from one of the professors' research is presented, where the cyclostratigraphy and astrochronological schemes of the Lithuanian Silurian period are analysed in detail. These activities have been confirmed during the site visit. The first- and second-cycle study programmes committees also encourage both teachers and students to use the latest scientific literature and analyse the most relevant topics. The teachers evaluate and coordinate the relevance of literature that the students analyse for performing individual tasks.

The quality of modern science and the knowledge of the newest findings are tightly related to national and international cooperation. The personnel have been involved in three international collaboration projects (UNESCO, Polish National Agency for Academic Exchange), six Research Council of Lithuania projects and 11 times the Vilnius University has supported research projects. It was established that the Vilnius University supports scientific research by inviting to submit applications for scientific idea implementation financing from the VU science

promotion fund. Furthermore, the VU Research Department helps to prepare applications for national and international science funds or/and or assists in ongoing project administration. However, it came out during the site-visit, not all researchers/teachers were aware of the central grant possibility provided by the University. Some personnel informed us that the grants were too small for the research, but sufficient for participation in conferences and helpful for publishing purposes.

Three main research groups of the departments cover the wide spectrum of modern research areas and have also high social impact (according to SER; p.19):

- 1) Geology of the Precambrian crystalline basement;
- 2) Palaeontology, stratigraphy, and sedimentology;
- 3) Hydrogeology and Engineering Geology.

It needs to be mentioned that not all above mentioned topics show high-level publications each year. Hydrogeology and Engineering Geology departments show the lowest number of research projects and relevant publications. This is quite understandable since these sub-fields are very practical ones and the need for fundamental scientific developments is low in Lithuania. However, the potential for fundamental and high-level applied research Hydrogeology and Engineering Geology departments is high and the panel suggests for those departments to increase research activities.

It was also mentioned by several staff members during the visit that on national and international level, cooperation activities have been extending. For example, collaboration with the researchers from the Nature Research Centre is particularly active, including research topics such as paleoseismicity, organic geochemistry and basin analysis, studied on scanning electron microscopes and other topics. Some research on palaeontology, stratigraphy, sequence stratigraphy and isotopic analysis are also carried out in collaboration with University of Tartu (Estonia). Research on sedimentology and on the Baltic Sedimentary Basin is carried on in collaboration with researchers from Aachen University. There are few visits by foreign scientists to Vilnius, for instance there was one professor from University of Wroclaw, Poland. These collaborations are topical, and these activities also support the teaching activities.

However, the panel suggests increasing the number of visits by foreign lead scientists, as well as for the departments' researchers/teachers the number of foreign visits need to be increased to enlarge the visibility of Lithuanian geological research on an international level. In conclusion, the link between research and study process with the latest developments in science is sufficient.

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

According to the SER (p. 22), more than 40 teachers or researchers from Vilnius University and other institutions (Lithuanian Geology Survey, the Nature Research Centre, UAB Geobaltic and others) take part in the implementation of the first- and second-cycle Geology study programme. This shows a diversity of specialists involved in everyday research and teaching activities, and it forms a base for the first- and second-cycle students to be involved in fundamental research and applied science. This kind of student's involvement was confirmed during the site visit by administration, teaching staff, students and representatives of employers and social partners.

There are different possibilities for the students to be involved in active research, such as being involved in supervisor (course work, thesis) activities and collaborating with different joint project partners. For the second cycle students, they can choose (at least for the Geology department according to communications during the site visit) the thesis topic and be advised on selection of the topic. It should be also mentioned that the science-oriented students are able to pursue MAGNA CUM LAUDE diplomas, provided they have achieved excellence in their university studies. According to the SER, „MAGNA CUM LAUDE Geology study diplomas are usually received not just by successful study graduates, but also those who have achieved scientific research results (e.g. co-authors of publications or those who read reports in international conferences or promotion events)“. It was also mentioned by teaching staff during the site visit those students who are actively participating in research can join the authors' team of a scientific publication (with their supervisor, for example).

Several individual examples of students' involvement in running research programs or projects are presented in the SER (pages 23-24). It was also confirmed during the site visit those students with high interest towards fundamental or applied science will receive strong support

and supervision by the staff members or associated partners. It was noticed that the staff would like to have much more interested (in Earth's sciences) students than the reality offers at the moment. This is evident from the table shown in the SER, which provides information on the number of students who are involved in research activities during the years 2017 – 2021 (p. 25). The number of students actively involved with current research activities is rather modest (in order of a few students per year). There are no good recipes for student's number increase in research projects, however, one possible way to attract more excellent young students is to promote more extensively the geological sciences in the schools (as Geology is not taught in Lithuanian schools). In summary, there are good possibilities for all interested students to get involved with current scientific research (or research groups) on the first- and second-cycle level.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Cooperation on an international level and rising cooperation on the national level (The Nature Research Centre).
2. Joint publishing of scientific research during the last years.
3. The students are involved in current research activities (however the number of involved students is still small)
4. The students are introduced to the modern scientific achievements through the 1st and 2nd cycle studies.
5. The study methods support technology transfer features and meet the needs of Lithuanian market requirements for Earth and Engineering sciences.

(2) Weaknesses:

1. Small number of foreign research visitors to give talks and presentations for the staff and students.
2. Hydrogeology and Engineering Geology researchers/teachers and students need a better integration into research and applied research projects.

3.3. STUDENT ADMISSION AND SUPPORT

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

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

Admission requirements for the first-cycle studies are well founded and are nationally specified and centrally administered by the University. The admission requirements in the geology programme are clearly elaborated and they follow all requirements applied for the second-cycle studies at the VU and are laid out according to the Senate-prescribed Rules of Admission to the Study Programmes of the Vilnius University. As stated in SER (p. 26), the entrance score is based on the mean value of the marks enumerated in the Diploma Supplement and a mark for the graduation thesis or marks for the final examinations. Students can apply to the second-cycle studies from various backgrounds, but during the expert evaluation visit it was noticed that students from different backgrounds are allowed to study without having to attend mandatory additional geology courses. This situation could result in miscommunication between students and the teaching staff and should be inspected further. Study process and module information is freely available on the University website.

Admission criteria and all other information regarding admission to the first- and second- cycle studies in Geology field in VU are publicly available and can be easily found on the University's webpage. The process of student selection and admission is transparent and clear.

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

According to the SER (p. 29), a foreign qualification equivalent either to the secondary or the equivalent-level higher education obtained in the Republic of Lithuania for the first- and second-cycle studies, respectively. The foreign qualification is considered individually on the basis of available information and the practice of evaluating and recognizing similar or equivalent foreign qualifications. This procedure ensures the consistency of qualification recognition practice.

Assuming the foreign person wishes to continue the studies at the Vilnius University in the field study programme, the recognition procedure has to be implemented, which can be done formally and informally. The first way is done by evaluating the correspondence of the foreign study programme to the formal and the course unit requirements. The formal requirements are, for example, about the study field group, study field, type of study programme and form of studies, whereas the course unit involves the aims, the competences, the content and the scope.

The recognition of student competences acquired through employment, volunteering, fieldworks, short- and long-term stays, training, seminars, projects, or through independent learning can be done through the regulations for recognition of the competences acquired by the students in an informal way and/or through the self-education and the the credit recognition of the course units. Finally, aspects of a programme that cannot be recognized include final examinations, final theses and other research papers that are included in the study programme as a separate course unit.

The assessment of knowledge has taken mostly traditional forms. Study subject documentations that provide information on assessment methods are provided online and easily accessible. Quantity of essays, lab work, examinations is appropriate to the programme. Fieldwork plays a significant part in learning how to apply textbook theory. Both Geology programmes currently offer multiple fieldwork practices during the course and the amount is appropriate according to both students and teaching staff. Lectures are generally evenly distributed during a week and over a semester. However, it was mentioned by students of both cycles during the visit that there is an “overload” in the final semester and the number of courses should be decreased since thesis preparation takes a lot of focus.

Students are provided with all necessary information about classes, aims and outcomes, subject requirements, and the scheduling of assessments, learning practices and study papers, although students have drawn attention to lack of communication from respective departments regarding the final thesis information (see also section 3.7). Students are encouraged to participate in research activities to be prepared for the MSc thesis.

3.3.3. Evaluation of conditions for ensuring academic mobility of students

The Geology field study students are encouraged to participate in multiple exchange study programmes such as Erasmus+, Nordplus during their studies. The faculty has over 26 agreements with the foreign universities by Erasmus alone. All information on mobility opportunities is available on the university website and during informational meetings. Yet only a few students use this opportunity because they cannot find universities that would provide lectures in English.

Students of the first-cycle are comparatively mobile with up to 3 students going abroad in the academic years 2017-18 and 2019-20. In this latter period two second-cycle students decided for the partial studies abroad. The most chosen institution was Lund University, Sweden and University of Porto, Portugal. Three incoming students from the Pusan National University South Korea and University of Toulouse II – Le Mirail, France were noted again in the 2019-20 most mobile academic year. Otherwise, only 1-2 students are going out or coming in. These mobility numbers are low and the Panel suggests encouraging students to use the different kinds of mobility instruments (including “semester away”) more actively.

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

Academic support – admittance, financial support, individual study plans etc. is provided at CAU, centralised support is provided by Student Services and Career Department. It is important to mention that students from mobility programmes can also receive counselling. Vilnius University offers several measures for social support such as psychological assistance, cultural and leisure activities, services for students with special needs and many more as stated in the SER (p. 31).

The mentorship programme, that focuses on the improving of both cycle students' academic and personal achievements, increasing their motivation to study, and acquiring the valuable experience of the mentor, is considered as successful, and since September 2019 it has been established for all 14 academic units. Year 2020 resulted in 103 volunteer mentors from various fields and 123 students who participated in the programme. The mentorship programme in

Geology (both cycles) offers two mentors, however any mentor from the programme can be used for communication from the mentorship platform.

In 2020 over 10,000 VU students participated in different types of training which were offered by the university. The most popular training topics were: stress management, effective learning, presenting yourself to employers, writing a CV and a cover letter, and simulating a job interview. Additionally, the Counselling and Training Centre offers professional psychological counselling (a cycle of consultations) in a wide range of issues. At the Community Development department several coordinators are available to deal with equal rights, diversity and non-discrimination, disability and individual needs.

There are various ways of the social scholarships and in years 2017-2021 five of them were given to the Geology field students along with five one-off earmarked scholarships and seven state loans to students (this latter administered by the Department of Disability Matters under the Ministry of Social Security and Labour). Finally, two scholarships were awarded from the 5 different nominal scholarships. All procedures for the scholarships are described on the University website

(<https://www.vu.lt/en/studies/academic-info-for-students/scholarships-and-finances>), and also provided during the introductory lectures of the first semester and reports read at the freshmen camps and the integration week.

Talented students with exclusive academic excellence and taking part in research may be eligible for special VU grants according to the study and the research fields. Incentive scholarships for very good learning results are also available, and in years 2017-2021 twenty nine scholarships were obtained by the Geology field students. However, the onsite visit showed that the scholarship for good grades is rather small and discourages getting good grades. Instead, students are looking for part-time jobs, usually unrelated to their study programme. Increasing the scholarship would benefit larger students' involvement in the learning processes and, hopefully, in looking for the geology-related job positions.

Social partners (private companies) promote first-year students from socially supported groups – a grant of 200 euros per month is awarded to 2 people. The conditions for receiving this grant are clearly defined. In the academic year 2022/2023, only 1 grant was used, as no more applications were received.

3.3.5 Evaluation of the sufficiency of study information and student counselling

Information about studies can be always found at several levels: as a general information about the study process (provided centrally by the Student Services and Career Centre), as the specific information, which is provided in the study departments of Geology field academic units, and as the individual meetings with academic consultants and lecturers. Additionally, the Students Representation serves as a source of information for students.

The way on how the counselling is provided is various, and in 2021 most of it (49%) was done centrally by the Student Services and Career Department by e-mail. The direct inquiry system available on the University website served in 25% of the cases, whereas 23% - in a traditional way by phone. Remaining 2% and 1% is done on the social media and physical meetings/discussion forums, respectively.

The VU academic units provide all information about the study process (the study calendar, lectures, exam schedule, choices regarding studies, result evaluation, retakes), partial studies abroad, payment for studies, scholarships, and study financing. Additionally, students are informed about the relevant activity offers in the form of a newsletter, which happens usually once a month. The Student Services and Career Department, Counselling and Training Centre, and VU Students' Representation provide a newsletter about the upcoming events twice a month.

According to the SER (p. 33), teaching staff inform students about the intended outcomes of the programme, the content of course units, and career possibilities. This latter is also spread out during meetings with alumni and potential employers. Nevertheless, there is a need to increase the contacts with the potential employers as stated during the site visit. The better information flow should be ensured, especially in terms of the employers' need for getting the new workers, which according to the site visit, is urgent and quite large.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. There are several schemes for student's support during the first- and second-cycle studies.
2. The mentorship programme is successful at the VU.

3. Students' academic mobility is supported by the University.
4. Social partners award grants to students from socially supported groups.

(2) Weaknesses:

1. Low student's interests to use academic mobility instruments.
2. Students' admission numbers are lower than needed.
3. Incentive scholarships for very good learning students are available but this type of support is rather low and discourages students from getting good grades and looking for a job in their discipline.
4. Ensuring better information flow between the students and the potential workers.

3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

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

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

Geological studies are conducted only on a full-time basis. Teaching and learning activities include classroom work such as lectures, seminars, practical and laboratory work, presentations and analysis of reports, case studies, group works, discussions, training, consultations, etc. Both study programmes also include field work and scientific practice. Scientific research projects are an important part of studies.

Both the first and the second-cycle students are required to write their final thesis, as a final step in completing the Geology field studies. Students receive feedback on the results achieved after each stage. The student study and evaluation methods are presented in detail in the description of each study programme subject. The following basic evaluation methods are used: exams, tests, presentations of practice and laboratory work, coursework, presentation of scientific research work, etc. The same performance evaluation criteria are applied to all students.

In developing professional independence, geology students also participate in scientific conferences, e.g. "Open readings" etc., in which they present the results of their research. Social partners are also included in the educational process, as they provide opportunities for students to develop skills necessary for performing professional work.

Geology study programmes are created in the way that after graduation, students get all knowledge needed for the professional activities. The study processes and learning methods are clearly described and communicated to students. An important role in the learning process also plays social partners (employers) who closely cooperate with the educational institution. They create conditions for students to develop skills necessary for professional work.

The present educational approach (various teaching and learning methods, as well combination of classroom, laboratory and individual work with field practicals) ensures that the teaching and learning process takes into account the needs of the students and enables them to achieve the intended learning outcomes.

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

The University states that it aims to provide an opportunity to study for socially vulnerable groups and students with special needs. Individual learning programmes can be created for this purpose. The University can offer flexible assessment forms adapted to students with special needs. Students from socially vulnerable backgrounds or with special needs can receive various financial support. Its receipt is transparent and clearly defined. Students can also receive professional psychological counselling in solving issues regarding personal life, family, studies, and social integration. In case of serious illness or childcare, students may take academic leave.

Geology studies can be adapted to socially vulnerable people by providing appropriate financial support and psychological assistance. People with special needs could study the geology programmes after adapting an individual study plan. However, the Institute of Geosciences is not yet fully adapted to students who have mobility disabilities. The faculty should resolve this problem as quickly as possible.

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

The University monitors the study progress of the major degree programme students on several levels. First, the student's progress is evaluated by the subject teacher. The supervisors

of research fieldwork and scientific work projects also observe their students' progress. Therefore, students receive feedback about the achieved results after each learning stage. The progress of all students is monitored by the Study Administration Department. The Department of Student Services and Careers monitors student dropout rates and implements a dropout prevention action plan. Underachieving students are provided with information about the possibilities of retaking the exam, various forms of training and counselling, how to prepare for the retake, etc. If a student is thinking of terminating their studies, then, according to the study termination procedure, they must first meet with an academic advisor and discuss all the reasons for terminating the studies and the possibilities to overcome those reasons. The study programme committee collects information and feedback about students from the institutions where they did their internships. The SPC also evaluates the results of the final thesis defence.

The progress of the students is monitored using clear and well-defined processes. University has a system to monitor and control the study process via various data sets and proactively prevent the dropout of students.

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

Graduate career tracking is implemented through the Career Tracking Information System (CTIS). The employability rate is quite high after completing a geology studies. According to available data one year after graduation more than 70 % of first-cycle graduates of Geology field studies and more than 80 % of second-cycle graduates are employed on a contractual basis. Some of the students are even employed during their period of study. The graduates state that they have no problems in employability. Employers are satisfied with student preparation. This shows that the both geology study programmes develop the necessary competencies. It should be noted that the demand for geology specialists is quite high, at least 10 specialists per year. There is a strong relationship between the University and social partners, including employers who participate in assessments of thesis and provide institutions with regular feedback through surveys and discussions to ensure continuous improvements, particularly in relation to the relevance to the job market.

The University keeps close contacts with social partners, which allow them to improve the qualifications and experience of graduates, to receive various feedbacks and to meet the needs

of the market. Graduate employment has a very good potential. In general, graduates have no problem finding a job in their profession.

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

The University has the Vilnius University Statute, the Academic Ethics Code of Vilnius University, the Diversity and Equal Opportunities Strategy and other documents for the academic ethics which must be adhered to by students and staff. VU Study Regulations stipulate those students who have violated academic ethics may be censured or expelled from the University. The University has a special anonymous hotline, which can be used to anonymously report violations of the principles of academic ethics or tolerance and non-discrimination. There were no procedures in the last three years.

The available means to implement the policy of ensuring academic integrity, tolerance and non-discrimination are fully sufficient.

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

Students can appeal the results of the evaluation or complain about the study process. The procedure for submitting an appeal is determined by the Regulations of the Dispute Resolution Commission of the Core Academic Units. People who do not agree with the examination procedure or evaluation can submit a complaint to the Appeals Commission. The commission analyses complaints and makes decisions regarding them. In the last 3 years, no appeals have been submitted to the Faculty of Chemistry and Geosciences Academic Ethics Commission.

University has all the procedures to ensure effective appeals and complaints. The procedure for filing and investigating appeals is clear and transparent. However, no appeals were submitted by both programmes.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The University involves students in the learning process. The form and methods of studies, the various teaching and evaluation methods applied, help to achieve study results, and prepare specialists for the labour market.
2. Students' learning progress is monitored at various levels, after each learning stage feedback is received about achieved results. Student study and evaluation methods are presented in detail in the description of each study programme subject.
3. The university has strong relations with social partners who actively participate in the study process.
4. The demand for specialists is sufficient, so graduates have high employability.
5. The policy for ensuring academic honesty, tolerance and non-discrimination is clear and transparent.

(2) Weaknesses:

1. The Institute of Geosciences is not yet fully adapted to students who have mobility disabilities.

3.5. TEACHING STAFF

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

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

According to the SER (p. 43) Vilnius University teaching staff are employed in accordance with the Vilnius University „Procedure for the Selection and Evaluation of Vilnius University Teaching and Research (Art) Staff“:

https://www.vu.lt/site_files/Vilniaus_universiteto_d%C4%97stytoj%C5%B3_ir_mokslo_meno_darbuotoj%C5%B3_konkurs%C5%B3_pareigoms_eiti_i_aestavimo_organizavimo_nuostatai.pdf.

The teaching and research staff (except for visiting/temporary teaching and research staff) are appointed to primary or higher positions after winning a public competition for a position at the University. The duration of a teaching contract is five years. After the election for the same position twice, the person will be granted the permanent employment contract. The research and teaching staff undergoes evaluation every five years, thus ensuring the teaching and Basic scientific excellence of each member of the staff. The SER states (p. 44) that “Out of 26 field

teachers, 16 (62%) have been working for no less than 3 years and at least part time. However, 10 teachers are hired only during specific semesters because they are the only and the best specialists in Lithuania at the moment, and this way the students receive the necessary knowledge from the teachers with the greatest practical experience.”

The teaching staff are engaged in research relevant to the subjects they teach. Practically all staff are involved in active research, however not all staff members have additional funding for the research. As the publication and conference costs can be covered from the University centralised funds, this may not be an obstacle for future research activities. However, the panel found that it would be beneficial for both research and future teaching developments, that the staff members should be more active in applying for national and international projects.

At present, the quality of the research outputs is mostly good with the majority of staff having published in several international journals in the past 5 years. However, increase in publications in the international high-level journals could make Departmental research more visible at national and international level, and probably also attract more students, at least for graduate and postgraduate levels.

In the SER appendix (Appendix 4) staff work experience, research topics and three major publications from the last 5 years are listed. For staff on Professors and associated professors' level, the journals include some high ranked Q1-Q2 journals, however some more “regional” journals (Q3-Q4) are also indicated in the list. There is a space for improvement for publishing of active research results in high-ranked journals for the half of the staff members.

The age pyramid for all departments in the field is looking good. During the five-year period, the teaching staff rotation practically did not happen. A few doctoral students started teaching several courses, thus providing them a possibility for acquiring pedagogical experience and coherently integrating them into the teaching team. Generally, the teaching staff are well qualified both academically and by virtue of professional experience outside the University, the number of the staff is sufficient, and the staff meets the requirements for teachers established by VU. The panel encourages teaching staff to be more active in national and international grant applications and increase the number of good-level scientific publications.

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

The SER describes (p. 47) that the research staff and teachers can improve their academic competences and mobility by taking part in several exchange programmes through Erasmus programme, by inter-university joint projects, and by participating in qualification development activities.

There are only a few visits by the staff members abroad – during 2018 - 2019, one associate professor and one junior assistant have been visiting foreign institutions for training purposes, while in 2019 - 2020 two junior assistants have been engaged with international training. It was told to the panel members during the visit that participating in international conferences is supported by Faculty and University funds, and nearly all applicants have had the opportunity to participate in conferences. At the same time the panel received the feeling that not all staff members are eager to visit foreign institutes for lecturing purposes or scientific conferences. Possibilities for the academic mobility for the staff members at the departments are good and considerable, however, sometimes there is a lack of interest towards this kind of activities. The panel advises to use mobility instruments more actively.

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

It has been mentioned in the SER (p. 47) that for the lecturers and research staff, teaching competence development training has been organised by the central administration of the Vilnius University (since 2017). During the period of 2019 to 2021, more than 45% of departments' teachers attended training sessions. The teachers performed a "Innovative teaching" training, during which once per week, remotely, they see their colleagues, share the ideas that they've learned during the training, as well as discuss and consult each other.

During the Covid-19 pandemic, the departments' teachers participated in distance training, including activities on MS Teams platform. Teaching staff who participated in educational competence development trainings have emphasised the benefits and importance of these trainings.

In conclusion, it can be mentioned, and it was also confirmed during the site visit that all the staff members have good possibilities to take part in specific courses designed for improving teaching and supervisory skills, and it has been helpful for them.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Good age pyramid.
2. University's support and other financial instruments for conferences and academic mobility are available.

(2) Weaknesses:

1. Low staff mobility, unused instruments to support mobility.
2. Low publishing rate in leading international journals for part of the staff members.

3.6. LEARNING FACILITIES AND RESOURCES

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

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

During the visit, the expert group inspected the rooms and facilities available for studies. 22 rooms and 10 laboratories located in the Institute of Geosciences are used for the implementation of the both Geology programmes. The rooms used in the study process are in very good condition, and many of them have modern equipment for lecture demonstrations. The rooms are of sufficient size. There are currently no issues with the occupancy of these spaces.

Much of the lab equipment is old but still usable for learning purposes. Polarising microscopes are unusable and should be replaced with new ones. Some expensive equipment, e.g., the chromatographs available in the hydrogeochemistry laboratory are rarely used because there is not enough research. Some laboratories, e.g., geofiltration, and soil mechanics are too small in space, they should be moved to larger rooms. Specialised software installed on department computers is also used in teaching processes. Essentially, the available equipment is sufficient to fulfil the training objectives. It would be good to acquire a program for the mathematical modelling of geological and geoenvironmental problems.

The Department of Geology and Mineralogy has adequate teaching collections of rocks, minerals, and fossils. There are more than 4000 samples used in the studying and teaching process. For study purposes, students are allowed to use an open exposition of rocks, minerals, and fossils in the Museum of Geology. Library provision is adequate and is good concerning textbooks, electronic sources, and databases. The reading room is open 24 hours a day.

During the field practice, students are provided with the necessary equipment and accommodation.

The learning facilities and resources leave a very positive impression. They are sufficient for the geology study programmes.

Overall, the material resources are good and enough to achieve learning outcomes. Some laboratories could be changed and improved and some equipment could be newer but nevertheless the material resources are good and the HEI has the necessary equipment for the whole study process. Vilnius University should take into account that some time in the future, the faculty will need to renew the equipment and also maybe rethink the spaces of laboratories.

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

Publications, literature, databases, etc. necessary for the implementation of study programmes are being constantly updated. Funds from the library fund are allocated for this. The teachers decide what kind of publications are needed. Equipment required for studies and software is purchased through ongoing projects. The University can finance only 70% of the equipment purchase. The rest required must be covered from the own budget.

The premises used for studies are in good condition, so they need to be renovated, it does not need to be now, it does not require any major funds. It should be noted that the necessary number of samples for laboratory tests is provided (free of charge) by social partners.

The informational and methodical resources used are fully sufficient to achieve the learning results. However, clearer financial strategies are needed when purchasing the necessary equipment because at the moment they are defined clearly.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The current rooms are in good condition. There are necessary tools available to organise the teaching and learning processes.
2. The laboratories are fully equipped with all necessary equipment for laboratory work, except polarising microscopes.
3. Informational and methodological resources are sufficient for the implementation of study programmes.
4. Good cooperation with social partners ensures the necessary number of samples for laboratory tests. Expensive equipment of partners can be used during field practices.

(2) Weaknesses:

1. There is expensive laboratory equipment e.g., chromatographs, which are used quite rarely.
2. Polarising microscopes are unsuitable for laboratory work and should be replaced with new ones.
3. Rooms of geotechnical laboratories are too small.
4. There are no clearly defined criteria for purchasing training tools and equipment.

3.7. STUDY QUALITY MANAGEMENT AND PUBLIC INFORMATION

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

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

The SER states (p. 58) that the VU has developed a study quality assurance system as part of the project 'The Development and Implementation of an Internal Study Quality Assurance System at Vilnius University', which is implemented in accordance with the standards and guidelines for quality assurance in the European Higher Education Area. Study quality assurance is based on the fostering of a quality culture at Vilnius University. This culture is grounded in the values of the VU mission, study data monitoring and analysis, and internal dialogue about the constant improvement of quality.

Internal quality assurance is based on the following principles: study programme approval, monitoring, and evaluation, the monitoring and analysis of the study process; implementation and improvement of student performance evaluation, blended learning, computer testing and plagiarism screening systems, a teaching staff competence improvement and development

system that encourages the application of innovative teaching and performance evaluation methods in the study process to implement student-centred learning.

The study programme committees are responsible for assuring the quality and constant improvement of study programmes. The committees base their activity on the Regulations of the Study Programme Committee of VU. Study programme committees report to faculty councils, and have to report about the implementation of the programme at least once a year. The reports present the following informations: about the numbers of admitted students, the distribution of admittance grades, study internationalisation, student satisfaction of the study programme and its subjects/modules (survey results), the material resources of the programme, programme operation expenses, the subject and teaching competences of the programme's teaching staff, student workload, and other data about the study process as performance monitoring (academic debts, debts, academic leave, study suspension, termination, graduation, continuing studies in a higher cycle, employability, etc.) and other relevant qualitative and quantitative data related to quality assurance.

The Study Programme Committee consists of two shareholder representatives from the Lithuanian Geology Survey under the Ministry of Environment and the Geology and Geography Institute of the Natural Sciences Centre. The shareholder representatives in the study programme committees also teach in the field study programme part time, meaning that they are very familiar with the actual study process situation. They submit their suggestions regarding this process and the improvement of the study programmes, and participate in the field studies evaluation. The field study programmes and their quality assessment results are presented in the annual discussions of the Association of Geological Enterprises and conferences as well as the summits of the Geological Society of Lithuania and informal meetings with the representatives of geology companies.

Internal quality assurance is kept by utilising various processes and procedures, and assured by the study programme committees. The students are surveyed to reveal their satisfaction with the subject modules, and teachers whose subjects are mentioned, are asked to improve in the surveys. The recent student opinion has not required any particular decisions from the Study Programme Committee to improve the field studies. However, some studying overload or not properly set curriculum was revealed during the on-site visit.

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

Volunteer University teaching staff and alumni are involved in internal quality assurance by sharing their personal experience and contributing to the personal and professional development of the students and strengthening the University community. Two mentors, offering mentorship in Geology, participate in the mentorship programme.

Two shareholder representatives from the Lithuanian Geology Survey under the Ministry of Environment and the Geology and Geography Institute of the Natural Sciences Centre belong to the study programme committee composition. Because the shareholder representatives also teach in the field study programme part time, they are familiar with the actual study process situation, submit their suggestions regarding this process and the improvement of the study programmes, and participate in the field studies evaluation.

A reasonable number of external stakeholders is included in the Fields' Study Programme Committee. The social partners and employers provide opportunities for the final degree project or research work, and contribute in the defence commission of the final degree projects.

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

As stated by the SER (p. 58) the Fields' Study Programme Committee is responsible for the quality of the implementation and of the studies of a specific study programme.

The information on the study quality and feedback from interested parties is gathered at VU based on the regulations for the organisation of VU social shareholders' feedback for study development and is related with the VU strategic plan indicators.

Data collection takes place both on the Vilnius University scale and in separate departments as well as different study programmes. On all levels the data obtained through different methods complements one another, which ensures the diversity of quality monitoring.

The University website provides all most important institutional academic information, and the VUSIS or personal university email is for receiving any individual-based information to each

student. Through email the students are also sent the official information and relevant activity offers in the form of a newsletter.

Detailed survey results about CAUs and study programmes are published in the “Feedback” section of VU internal website (intranet) and are used by different units of the HEI. Specific information is spread out centrally at the VU website. However, on-site visit showed that some information i.e. about the thesis' subjects are not properly exposed and require an additional effort to find them out.

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

According to SER (p. 60), the students have the opportunity twice a year to anonymously express their opinion about the quality of courses of their study programme. Survey is centralised, for the first- and second-cycle students and is done using the VU online survey system, which is integrated into VUSIS.

The first part of the survey is about specific subjects studied during the semester and is carried using the recommended university subject questionnaire. Once accessing section ‘Surveys’ in the VUSIS system, students can leave anonymous feedback about studies, including specific subjects, teaching staff can see direct data about student feedback on their subjects, the chair of the study programme committee can see all student feedback about the subjects of the study programme, and finally the faculty administration can directly see all student feedback about the subjects of all CAU’s study programmes.

The second part of the survey is about the general satisfaction with studies of the semester. Detailed survey results about CAUs and study programmes are published in the “Feedback” section of VU internal website (intranet), and is used further used by the operators of the programme for the improvement of the programme or its subjects (modules), by the study programme committee or the CAU administration for continuous quality assurance and improvement, for the preparation of self-evaluation reports for external evaluations, when conducting an analysis of planned study programmes, by the evaluation commission during teaching staff evaluation, for the improvement of other faculty and University activities.

Other surveys have been also considered, for example first-year student survey on the admission process, the reasons for choosing the studies, and their expectations is carried out during the first study semester by the Student Services and Career Department, the final-year student survey on the study programmes, the quality of its implementation, and study conditions is carried out at the end of each semester by VU Study Quality and Development Department, Study fieldwork survey on the fieldwork quality is carried out at the end of each study semester and currently performed by the CAU, but it is planned to have it as centralized surveys at the Student Services and Career Department in the future, the incoming exchange programme students' survey on the programme implementation is carried out at the end of each study semester by the University central administration international relations department, the outgoing exchange programme students' survey on the implementation of the exchange programme is carried out at the end of the Spring semester by the International Relations Office, student survey on the fieldwork abroad about the fieldwork quality is carried out at the end of each study semester by the Student Services and Career Department, student survey on study terminations about the reasons for terminating the studies is carried out during time when the student hands in their completed requital form to the University by the Student Services and Career Department and graduates' survey on the competences acquired during the studies as well as their establishment in the labour market is carried out after 12, 36, and 60 months of graduation by Student Services and Career Department.

There is a larger and larger involvement of the students who participate in the first- and in the second-cycle study survey. Among 45–80% participants, 50–65% revealed their satisfaction (satisfied and more satisfied than not) with the content quality of the study subjects (and this refers to 60-75% of the first-cycle students and 60-100% of the second-cycle students). Recommendation of the geology study programme to others would be done by 60-75% of the first-cycle students and 70-100% of the second-cycle students. The Covid-19 turned two semesters of the study field programmes in 2020 in the virtual learning environment. Interestingly, the survey results demonstrated that the second-cycle students prefer the combination of contact and distance learning. Additionally, the on-site visit showed that students are generally satisfied with their studies.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Involvement of the external partners in the final degree project or research work is beneficial for both study programmes and students.
2. Students' survey about the both field study programmes reveals their general satisfaction with their studies.
3. The internal quality assurance system of the studies is controlled in various ways.

(2) Weaknesses:

1. Some information (i. e. regarding the topics of the final theses) is not properly exposed and requires bigger effort to be found.
2. Surveys revealed that there is no need for the both study programmes to improve. However, the studying overload is noted, especially in the most crucial semesters when the final thesis must be prepared.

IV. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	<ul style="list-style-type: none"> ● The relationship between students and the social partners might be strengthened in order to become more beneficial for both sides. ● Social partners point out a need for even more practicals for the students. The HEI should evaluate the need for this action. ● Bridging courses are needed in the second-cycle of the programme.
Links between science (art) and studies	<ul style="list-style-type: none"> ● Hydrogeology and Engineering Geology students need a better integration into research and applied research projects.
Student admission and support	<ul style="list-style-type: none"> ● Establish/compile courses/modules or lecture series to abridge the possible gap of Earth Sciences basic knowledge for Master students coming from other (suitable) fields.
Teaching and learning, student performance and graduate employment	<ul style="list-style-type: none"> ● More communication with students about the services provided by social partners, especially when choosing internships and thesis topics.
Teaching staff	<ul style="list-style-type: none"> ● Ensure the staff who are fully engaged as teaching personnel: (1) to have integration with suitable research topics; (2) or decrease their teaching load. ● Ensure better communication between students and supervisors during the full cycle of thesis preparation (selection of topic, theoretical and practical work, writing up and defence). ● Increase staff mobility. ● Encourage staff members and students to participate more in international projects. ● Increase the number of high quality publications.

<p>Learning facilities and resources</p>	<ul style="list-style-type: none"> ● Geotechnical laboratories are in need of larger rooms in order to accommodate equipment, samples, standards and sample archives. ● New polarising microscopes must be purchased. ● Make full use of all available laboratories' equipment. ● Establish clear criteria and funding sources for the purchasing of new tools and equipment.
<p>Study quality management and public information</p>	<ul style="list-style-type: none"> ● Better exposition of some information (i.e. proposed topics of the final theses) to the students, so they can find it easily. ● Improving distribution of some lectures/lab works/seminars to avoid their grouping in the crucial (final) semesters

V. SUMMARY

The following is a summary of the findings of the Expert Panel which is based on the Self-Evaluation Report (SER), provided other documentation, and the in-site interviews (Nov 11th 2022) with Vilnius University administration (faculty administration staff), the staff of the Department of Geology and the Department of Hydrogeology and Engineering Geology who are responsible for the preparation of the SER, with teaching staff of both departments and stakeholders (students, alumni, employers, social partners). The Expert Panel presents a positive evaluation to the implementation of the study field of Geology first- and second-cycle programmes at Vilnius University with all areas assessed as good and very good. The highly positive findings of the Expert Panel were echoed by former and current students as well as representatives of employers and other social partners. As the Vilnius University is the only university in Lithuania providing Geology Programme, it is vital, the programme continues on a high education level, is sustainable and meets national/international quality requirements and Lithuanian labour market needs.

Curriculum design generally meets legal requirements, the contents and teaching methods are appropriate for the achievement of intended learning outcomes. Students received all the necessary knowledge for professional activities after completing studies. The University has a system to monitor and control the student study process and all means and procedures to ensure academic integrity, tolerance, and non-discrimination. There is a strong relationship and excellent collaboration with social partners that has an important role throughout the program. Employability is excellent and employers are satisfied with the knowledge acquired by graduates.

Scientific research of the Geology Department is sufficient to support the teaching process. The staff of the Hydrogeology and Engineering Geology Department has somewhat lower activity in fundamental research, mostly due to subject specifics. However, it needs to be mentioned that there is a space for improving publications quality and number for the both departments. There are good signs of international cooperation and joint projects, however, higher activity in applying national and international research grants is strongly suggested. The Hydrogeology and Engineering Geology Department researchers and teachers and their students need a better integration into research and applied research projects.

Generally, the teaching staff are well qualified both academically and professionally. The age pyramid for both departments in the field is looking good. During the five-year period, the teaching staff rotation practically did not happen. A few doctoral students started teaching courses, which gives them a possibility for acquiring pedagogical experience and to be integrated into the teaching team. The number of the staff is sufficient, and the staff meets the requirements for teachers established by VU. Possibilities for the academic mobility (visiting conferences, other research institutions etc) for the staff members at the departments are good, however, sometimes there is a lack of interest towards this kind of activity. The panel advises to use academic mobility instruments more actively.

The student admission requirements in the geology programme are clearly elaborated and publicly available, thus easy to access. Problem remains the second-cycle studies, when the students from the various backgrounds of their first-cycle study can apply and get accepted as the second-cycle students. The study visit revealed that additional bridging courses are required to avoid a situation when the second-cycle students lack a basic knowledge in geology.

The study audiences are in good condition, the laboratories are equipped with all the necessary equipment. However, there is part of old equipment that needs to be updated, as well as larger premises for geotechnical laboratories. The library resources are adequate and sufficient with respect to electronic sources and databases. However, clear criteria and funding sources for the purchase of new equipment must be established.

One of the key issues is to make sure that a relationship between the students and the social partners is stronger. This will be beneficial for both sides, because the social partners gain the well-qualified workers, whereas the students do not need to worry about their professional geology-related jobs.

An efficient information flow between students and teachers/supervisors, but also the social partners, shall be kept to ensure an internal communication between people, ideas and opportunities.

The Expert Panel would like to thank the faculty administration and the staff of the Department of Geology and the Department of the Hydrogeology and Engineering Geology, evaluation coordinator Irma Dzikariene for their professional, flexible, and supportive provision of

information. We also would like to thank participating students, representatives of employers and social groups for their objective observations and opinions about the research, teaching, and study programme of the geology field at Vilnius University.

Expert panel chairperson signature:

Prof. dr. Alvar Soesoo

(signature)