



**MINISTER OF EDUCATION, SCIENCE AND SPORT OF THE REPUBLIC OF
LITHUANIA**

ORDER

ON APPROVAL OF THE DESCRIPTOR OF THE STUDY FIELD OF GEOLOGY

7 June 2022 No V-924
Vilnius

In accordance with Paragraph 11 of Article 53 of the Law on Higher Education and Research of the Republic of Lithuania:

1. I approve the Descriptor of the Study Field of Geology (enclosed).
2. I determine that the higher education institutions have to adjust their study programmes to the Descriptor of the Study Field of Geology approved by Clause 1 hereby until 1 September 2023.
3. I recognize Order No V-811 of the Minister of Education and Science of the Republic of Lithuania of 23 July 2015 “On Approval of the Descriptor of the Study Field of Geology” as invalid.

Minister of Education, Science and Sport

Jurgita Šiugždienė

DESCRIPTOR OF THE STUDY FIELD OF GEOLOGY

CHAPTER I GENERAL PROVISIONS

1. The Descriptor of the study field of Geology (hereinafter referred to as the Descriptor) regulates the special requirements for the study programmes in the study field of Geology (N03) that belongs to the group of study fields of physical sciences (C). The Descriptor regulates the study field of Geology (hereinafter referred to as the field of Geology) in the scope not covered by the General Requirements for the Studies approved by Order No V-1168 of the Minister of Education, Science and Sport of the Republic of Lithuania of 30 December 2016 “On Approval of Description of General Requirements for the Provision of Studies”.

2. Requirements of the Descriptor shall be applied to the first and second cycle university study programmes of the study field of Geology.

3. Study programmes of the study field of Geology may be carried out only as full-time studies and only in universities.

4. The scope of the first cycle studies shall be 240 credits. It is recommended to award at least 20 credits to practical training, and at least 15 credits to the final thesis (project). At least 160–180 credits should be allocated to subjects in the field of Geology.

5. The scope of the second cycle studies shall be 120 credits, of which at least 30 credits shall be awarded to the preparation and defence of the final thesis (project). An integral part of the final thesis may be a scientific project as a separate subject.

6. First cycle studies shall be implemented as a single field of study. Second cycle studies may be implemented within the framework of interdisciplinary study programmes, where at least 90 credits are allocated to subjects in the field of Geology.

7. There are no special requirements established in the Descriptor for the persons, who want to be admitted to the study programme of the first cycle.

8. It is recommended that the persons admitted to the second cycle studies in the field of Geology be individuals who:

8.1. Have completed first cycle studies in the field of Geology;

8.2. Have completed university first cycle studies in physical sciences, mathematics, computer science, engineering, technology, life sciences, agriculture, health, humanities (history, archaeology, philosophy), arts (architecture) and social sciences. Graduates of college studies or university undergraduate programmes in other fields of study are required to undertake additional studies, the content of which is determined by the university. It is recommended that the volume of additional studies should not exceed 60 credits.

9. Graduates of studies in the field of Geology must be prepared to engage in geological or equivalent activities aimed at supplying consumers with mineral raw materials, groundwater, energy resources, ensuring sustainable use of the Earth’s underground resources, solving environmental protection problems of a geological nature, assessing natural risks and hazards, solving topical problems in geology, disseminating knowledge of geology to the general public, and so forth.

10. Upon completing the studies in the field of Geology, the graduate will be able to:

10.1. Apply the knowledge acquired in their professional activities, understanding their responsibilities as a geologist, and be will able to base their professional development on the principles of lifelong learning;

10.2. Apply the acquired knowledge in related professional fields, collaborate with other professionals and communicate freely with the public in order to achieve the best possible results in their studies and work.

11. Graduates of the second cycle studies of the study field of Geology shall be able to plan and carry out prospecting, exploration, production of various types of mineral resources (construction materials, water, oil and gas, hydrothermal energy, etc.), to provide geological advice to public authorities, agencies and surveys related with natural resources, to compile geological, geomorphological, hydrogeological, geoecological and the other specialised maps, to conduct Geology field investigations in various academic (and other) institutions carrying out research, to teach geology and earth sciences in higher education institutions, to plan and carry out engineering research in construction companies, various construction sites, to contribute to the sustainable economic development, to participate in exploration and use of alternative energy sources (e.g., geothermal), to consult and work in geology and nature museums, to edit and write papers for scientific journals, to continue studies in the third cycle programme and lifelong learning.

12. Upon completion of the studies in the field of Geology, the Bachelor's/Master's degree in physical sciences that is in conformity with the sixth/seventh level of the Lithuanian Qualifications Framework and the European Qualifications Framework for lifelong learning, and first/second cycles of the Framework for Qualifications of the European Higher Education Area, attested by the diploma of Bachelor's/Master's degree and its supplement issued by the higher education institution, is awarded.

CHAPTER II CONCEPT AND SCOPE OF THE STUDY FIELD

13. Geology is the theory and practice of the structure of the Earth, its evolution in time and space, cognition of geological past, present and future processes, modelling and forecasts, use and protection of subsurface resources.

14. Studies of Geology cover a wide range of theoretical knowledge and practical skills of general geology (mineralogy, petrology, sedimentology, mineral resources, structural geology, tectonics, palaeontology, stratigraphy and others), geochemistry, geophysics, hydrogeology, engineering geology, ocean geology, geomorphology, geology of Lithuania and the Baltic region, etc.

15. Geological studies shall include:

15.1. Coordination of geological field and laboratory investigations with theoretical knowledge – from observations to cognition, synthesis and simulation;

15.2. Deep analysis of geological processes, and comparison with the recent geological processes;

15.3. Spatial and temporal dimensions in the geological evolution of the Earth;

15.4. Concept of rational and sustainable use of mineral resources and their protection.

16. Geological interests shall be related to the following areas:

16.1. Environmental sciences and environmental studies – analysis of environmental changes and natural hazards' risk, forecasts, and environmental monitoring;

16.2. Ecology;

16.3. Biology (paleobiology, palaeontology);

16.4. Engineering (construction engineering, related to the engineering geology and hydrogeology);

16.5. Geography (related geomorphology, surface geology disciplines);

16.6. Archaeology (similar testing methods are applied; the natural environment of the past is restored).

17. Geology study programmes usually include the study of mathematics, computer science, physics and basic chemistry. Study process shall help acquire spatial thinking, assimilate the methods of analysis and the ability to apply them in modelling geological structures and processes

in time and space. Basics of chemistry and physics shall be acquired, as well as the ability to apply them when exploring geological materials and processes.

18. Study programmes of Geology shall meet the development of scientific research and relate it to other fields of scientific research.

19. Graduates of the first cycle studies of the study field of Geology may apply the acquired skills in working in geological enterprises (collection of material for mapping, supervision of drilling and drilling materials, participation in exploration and production of mineral resources), in construction enterprises (collection of material for engineering and hydrogeological studies), mining, oil and the other resources producing industries (technical supervision, documentation, assessment), secondary and special schools (teaching of Natural sciences), and by continuing their studies in the second cycle programme and lifelong learning.

20. Special geological abilities shall be used for public programmes related to the climate change, exploration and production of sustainable energy resources, forecast of natural (geological) hazards and their prevention, and to the other programmes.

CHAPTER III GENERAL AND SPECIAL LEARNING OUTCOMES

21. The learning outcomes of the first cycle studies (Bachelor's) shall be:

21.1. Knowledge and its application. The person:

21.1.1. Is able to identify and demonstrate the fundamentals of humanities and social sciences, to philosophically assess the acquired scientific knowledge;

21.1.2. Is able to demonstrate knowledge and effectively use the main laws of Mathematics and Computer science, which are applicable for systematisation and analysis of geological research data and information, to effectively apply knowledge of the basics of Chemistry and Physics in the interpretation of the ongoing underground geological processes;

21.1.3. Is able to identify and demonstrate the fundamental knowledge of Geology, necessary to know the Earth's underground, geological environment and its components, and to assess geological phenomena and processes;

21.1.4. Knows, is able to understand and correctly use geological concepts in the Lithuanian language and effectively use inventory knowledge of geological objects;

21.1.5. Knows, is able to understand and explain geological phenomena and processes and their interactions, to predict possible patterns of the interaction of the Earth's geological evolution and geological processes, tendencies of evolution of geological processes in a geological time perspective;

21.1.6. Knows, is able to apply the methods of geological investigations and monitoring, methods of documenting and modelling of geological environment;

21.1.7. Knows, is able to understand and explain the interaction of geological environment and economic activities, as well as sustainable use of underground and mineral resources.

21.2. Research skills. The person:

21.2.1. Is able to properly formulate research objectives and tasks, to choose the proper methods of investigations and analyses;

21.2.2. Is able to choose (identify, distinguish) information from primary and secondary sources, including search of strategic information, to systemise and structure quantitative and qualitative information and data;

21.2.3. Is able to apply theoretical knowledge of various branches of Geology in an integrated manner, analysing and summarising the research results;

21.2.4. Is able to formulate conclusions, rational arguments and proposals, to present research results and conclusions in writing and orally to different listeners.

21.3. Special skills:

21.3.1. Skills of complex analysis and generalisation. The person:

21.3.1.1. Is able to understand geological methodological postulates, theories for dialectic cognition of Earth, as an integrated system and the geological environment, and the principle of actualism, by applying different hypotheses;

21.3.1.2. Is able to effectively apply knowledge, skills and abilities, general physical science principles, knowing and explaining the structure and composition of Earth's underground at local, regional and global levels;

21.3.1.3. Is able to recognise and analyse the components of Earth's underground and geological environment (minerals, rocks, fossils, Earth geophysical fields, properties of the Earth, the underground resources, etc.), using the skills acquired in the educational field practice;

21.3.1.4. Is able to identify, analyse and explain the evolution of geological processes and events in an integrated manner, their causal mechanisms and changes in patterns based on a systematic approach, being aware of their spatial occurrence and occurrence in geological time;

21.3.1.5. Is able to recognise the valuable resources of Earth's underground and characteristics of geological environment, to explain the patterns of their formation and distribution, and sustainable use applying the principles of environmental protection;

21.3.1.6. Is able to identify and analyse specific practical geological problems in the context of theories of various branches of geology;

21.3.1.7. Is able to critically analyse and systemise geological information and data, to deal with qualitative and quantitative tasks of a familiar nature of different geology areas;

21.3.1.8. Is able to apply mathematical and computational skills, information technologies and technologies of geographic information system (hereinafter referred to as the GIS) for the analysis and investigation of geological objects, features, events and processes, to use special geological databases, specialised software by systemising, processing and interpreting the collected data.

21.3.2. Geological investigations. The person:

21.3.2.1. Is able to plan and carry out geological investigations of various branches of Geology, including geological field surveys and geological mapping, using the skills acquired in the educational field practice;

21.3.2.2. Is able to formulate problems of conducted geological investigations, to select correct methods and modern technology-based equipment, and to safely perform geological investigations;

21.3.2.3. Is able to plan and carry out geological mapping of various branches of Geology under different geological conditions – crystalline and sedimentary rocks; to process, interpret and summarise the findings of such investigations;

21.3.2.4. Is able to prepare documents of geological studies, including geological field studies, and mapping resume documents (maps of structure, properties and processes of Earth's underground, cross-sections, block diagrams and the other graphical documents) by using GIS technologies, mathematical and statistical modelling methods;

21.3.2.5. Is able to plan and safely conduct standard laboratory measurements and tests using modern analytical methods and equipment, and applying the latest technologies;

21.3.2.6. Is able to consistently apply geological knowledge while performing the professional expertise, planning, controlling and regulating use of the underground resources and producing them, ensuring their protection and carrying out other economic activities;

21.3.2.7. Is able to systematically monitor and measure geological phenomena and processes, to document results of their observations, to summarise observation data and prepare reports.

21.4. Social abilities. The person:

21.4.1. Is able to communicate in the correct Lithuanian language (oral and written) and business English (oral and written);

21.4.2. Is able to clearly and accurately in writing and orally present the data and arguments of geological and other researches to different listeners, to defend the presented results of activity;

21.4.3. Is able to work effectively in the changing or new environment, to carry out professional activities in a team and individually;

21.4.4. Is able to apply a holistic approach by taking professional decisions in order to balance the safety, quality and environmental impact; is able to apply humanistic morality norms and professional ethics;

21.4.5. Is able to understand environmental, legal and sustainable decision-making aspects, responsibility for their professional performance and its impact on the environment;

21.5. Personal abilities. The person:

21.5.1. Is able to plan and organise one's own self-learning and professional activities;

21.5.2. Is able to effectively apply the acquired knowledge in practice, to learn and develop one's own professional skills, to study and constantly develop professional competence while working and in lifelong studies;

21.5.3. Knows and is able to apply normative legal documents, to analyse and follow them in practical geological and exploratory activities;

21.5.4. Is able to effectively apply the acquired knowledge and skills of the use of the newest special information technologies and equipment in professional activities.

22. The learning outcomes of the second cycle studies (Master's) shall be:

22.1. Knowledge and its application. The person:

22.1.1. Is able to identify and thoroughly explain the conceptual foundations of Geology;

22.1.2. Is able to thoroughly understand and explain the chosen field of Geology and basic theories, concepts and principles of other Earth sciences; is able to integrate the acquired knowledge of various branches of Geology in solving of a variety of issues;

22.1.3. Ability to comprehensively and in a specialised manner explain the structure, conditions, features, geological processes of the Earth's inner geosphere, continents and oceans, Europe, of the Baltic region and Lithuania, as well as their spatial differentiation, origin, evolution and development mechanisms in geological time;

22.1.4. Is able to systematically understand and explain in a specialised manner the spatial integration and differentiation patterns of geological phenomena and processes of the chosen field of Geology, ongoing dynamic processes of the geological environment and cycles in geological systems of various spatial scales in the context of geological time and space; is able to demonstrate thorough understanding of change in geological environment processes and phenomena, their interaction in space and time, critical extent, assessment and prognosis;

22.1.5. Is able to systematically understand and explain in a specialised manner the methods, tools and techniques of analysis (prospecting, exploration), assessment, sustainable use, prognosis of changes and protection of subsurface mineral and underground hydrosphere resources and their properties.

22.2. Research skills. The person:

22.2.1. Is able to properly formulate research objectives and tasks, to develop an optimal methodology for the research work applying modern analytical methods of the research and analysis and conceptual knowledge, to solve unfamiliar problems, to summarise the research results and to formulate conclusions, to effectively present them to various audiences, to prepare research reports and scientific papers;

22.2.2. Is able to systematically collect information from primary and secondary sources, including search of strategic information, to analyse publications, to find and use necessary databases;

22.2.3. Is able to systemise, critically analyse and structure quantitative and qualitative information and data using the latest information technology and equipment;

22.2.4. Is able to identify and analyse research problems of various modern geology branches, to plan strategies for their solution by combining theory and practice and realising pragmatic insights;

22.2.5. Is able to think systematically, to integrate ideas, to make hypotheses in the context of recent achievements, theories and principles of Geology and other Earth sciences, to apply principles of science integrity;

22.2.6. Is able to formulate research objectives and to apply modern innovative methods and the latest technologies to solve geological problems using knowledge and existing methods of other fields of science.

22.3. Special skills:

22.3.1. Skills of complex analysis, systemisation and evaluation. The person:

22.3.1.1. Is able to critically assess geological information and data, to deal with qualitative and quantitative tasks of a familiar and unfamiliar nature, to comprehensively analyse geological problems in an interdisciplinary context;

22.3.1.2. Is able to understand systematically, consistently and critically assess the methodological postulates of the selected branches of Geology, dialectic Earth as an integrated system and the geological environment, cognitive theories and the principle of actualism, applying the modern theories, to self-formulate explanations by highlighting advantages and disadvantages of various concepts;

22.3.1.3. Is able to critically and in an integrated manner assess the complexity, interoperability and integrity of problems in various Geology and other Earth sciences, feasibility of the ways for their solution in an interdisciplinary context; is able to assess the practical geological activities in the context of broader environmental principles;

22.3.1.4. Is able to consistently identify and to coherently analyse specific practical geological problems in the context of interdisciplinary theories, to plan strategies for their solution, by applying the acquired knowledge, abilities and skills in an integrated manner;

22.3.1.5. Is able to systematically understand and evaluate the need of different branches of Geology in separate applications of economic and other practical activities; to thoroughly and critically assess the need for and extent of geology knowledge necessary for a particular task;

22.3.1.6. Is able to critically assess strategic professional development decisions, to understand the accuracy limits of analytical and geological research data and to take them into account when planning further geological research;

22.3.1.7. Is able to critically and in an integrated manner analyse and assess various geological objects, processes and phenomena on the basis of one or more theoretical approaches, by combining theory and practice, using GIS technologies, mathematical models, statistical methods, analytical and geological field research skills.

22.3.2. Geological investigations. The person:

22.3.2.1. Is able to properly select and effectively apply methods of geological investigations, including geological field investigations, by performing complex geological research, formulating tasks to address a problem (or a part thereof) of applied nature in an interdisciplinary context; effectively applies the acquired geological knowledge and skills in a variety of economic development and other practical activities;

2.3.2.2. Is able to independently organise, coordinate and perform geological research of the selected branches of Geology, including geological field studies, and carry out geological mapping and laboratory testing using the latest modern technologies, equipment and techniques; is able to critically compares the results with the established theories and knowledge and draw conclusions;

22.3.2.3. Is able to effectively apply comprehensive knowledge of the selected field of Geology by planning, controlling, regulating, and providing expert assessment, as well as performing activities for the use of Earth's underground, production of natural and underground hydrosphere resource and other economic activities, by ensuring an integrated application of principles of sustainable use and protection of Earth's underground; is able to reasonably assess the adopted decisions in environmental, legal, social, economic terms and in terms of sustainable use thereof;

22.3.2.4. Is able to properly and safely use laboratory equipment, experimental systems and other information and data sources in order to appropriately plan and carry out experiments;

22.3.2.5. Is able to monitor, measure and assess geological phenomena and processes, to perform independently and document observations, to prepare and submit monitoring reports.

22.4. Social abilities. The person:

22.4.1. Is able to clearly and correctly in written and orally present in the Lithuanian language the data and self-formulated arguments of geological researches to different listeners, to argumentatively present and defend the results of different types of geological activities;

22.4.2. Is able to effectively use sources of information in English, to communicate in correct business English orally and in writing;

22.4.3. Is able to effectively and consistently manage time and organise own work;

22.4.4. Is able to work effectively in the changing (dynamic) and new environment, in a team and in an interdisciplinary environment;

22.4.5. Is able to consistently apply a holistic approach by taking professional decisions in order to balance the costs, benefits, safety, quality, reliability and environmental impact; ability to apply humanistic morality norms and professional ethics;

22.4.4. Is able to understand environmental, legal, social, economic and sustainable aspects of the adopted decisions, as well as responsibility for own professional performance and its impact on the environment and the society.

22.5. Personal abilities. The person:

22.5.1. Is able to think, formalise and model data and information in a creative, viable and logical way, to create new ideas, to independently formulate conclusions and rational arguments and to make decisions;

22.5.2. Is able to critically assess qualitative and quantitative information and data, to carry out an assessment having contradictory and/or insufficient information;

22.5.3. Is able to effectively combine independent and group work, to systematically organise professional activities, to independently plan the learning process and work;

22.5.4. Is able to effectively perform professional geology and geological research activities, to reveal a leadership role, to consistently pursue careers, to continue developing professionalism, to learn, work and communicate in the national and international sphere;

22.5.5. Is able to systematically develop essential traits of personality: responsibility, initiative, creativity, innovation, discipline, motivation;

22.5.6. Is able to systematically study and develop professional skills in a lifelong teaching and development of own professionalism.

CHAPTER IV TEACHING, LEARNING AND ASSESSMENT

23. Teaching and learning:

23.1. Teaching, learning and assessment activities shall be organised in such a way that students can achieve the intended learning outcomes of the study programme of the study field of Geology;

23.2. Implementation of the study programme of Geology shall be based on competent and qualified teachers seeking to teach a student to learn and organise his/her knowledge, capable of improving the teaching and learning content, selecting the appropriate student-centred teaching and student achievement assessment methods, developing new effective teaching methods and establishing a lifelong learning aspiration;

23.3. Teaching shall be based on fundamental knowledge of Geology and the latest achievements of Geology science. Methods of teaching shall develop understanding of conceptual fundamentals of Geology, be adequate to conveying existing scientific achievements in Geology science, provide the knowledge and skills necessary to achieve the objectives of the study programme, and enhance professional competence. Applied teaching and learning methods shall be clearly defined, regularly reviewed and improved;

23.4. Teaching methods shall be consistent with the concept of lifelong learning (continuous learning); the students should be prepared and encouraged to acquire skills of the ability to learn through their studies. Didactic system shall focus the studying on the development of a student's ability to learn;

23.5. Teaching and learning shall be based on clear objectives formulated by the teacher and the student, complying with the programme objectives and learning outcomes. Teaching methods shall be effective and varied; existing facilities and resources shall be used in the teaching process;

23.6. The choice of study methods (teaching and learning) shall ensure the possibility to achieve learning outcomes.

24. The following general study methods applied shall be:

24.1. Active methods (problem analysis and resolution tasks, preparation of a report or notice, discussions, project work, research work and others, which are focused on active, independent and team learning);

24.2. Interactive methods (e-learning courses of the subject, conferences in the virtual environment, portals of teaching materials, products of video lectures);

24.3. Passive methods (lectures, practicals and other methods of a traditional learning concept).

25. Some specific knowledge of Geology studies shall be acquired during geological field practice (fieldwork) and laboratory tests. Geological research helps to gain understanding of geological processes, the ability to recognise various levels in geological structures, collect and document geological information, to summarise, interpret and model it. A specific study method, giving the ability to recognise objects in nature, is studying minerals, rocks and fossil collections.

26. The following special study methods applied shall be:

26.1. Geological field studies (description and analysis of geological objects using various methods in the field), educational and professional field practices, providing a lot of the necessary practical skills, improving the student's motivation and helping decide on the further specialisation;

26.2. Study programmes of the first cycle studies shall include educational field practice in sedimentary basins and orogenic areas, allowing students to recognise sedimentary, magmatic and metamorphic rocks, structural and facial elements of geological succession;

26.3. Studying shall be focused on the multidimensional knowledge systematisation, perception of spatial and temporal components, understanding and modelling of the interaction of geological processes.

27. The same methods may be applied in different cycle studies, but the content and complexity degree of the given task should vary, as well as the student's self-sufficiency rate, etc.

28. Independent work is an important and integral part of the studies of geology. It is recommended that in the first cycle studies, the student's independent work should comprise at least 50 percent of the study programme. It is recommended that the student's independent work of the second cycle studies would comprise at least 60 percent of the study programme and at least 40 percent of each study subject.

29. Assessment:

29.1. A higher education institution, by setting the evaluation procedure, has the right to allow a teacher to choose evaluation methods. Teachers shall be aware of different ways of assessment, methodical aspects for their application and the role in the acquisition of knowledge and skills by the students. Student's learning outcomes shall be assessed using a ten-point criteria assessment system. Learning outcomes assessment system of the study field of Geology shall allow to monitor progress towards results, notice deviations in a timely manner, provide feedback, and create preconditions for correction. Assessment procedure, assessment system and assessment criteria should be based on the principles of validity, reliability, clarity, usefulness, and impartiality;

29.2. Strategy of for the assessment of learning outcomes shall disclose whether the outcomes achieved by a student are consistent with the requirements and reliably reflect the level of knowledge, abilities and practical skills that the student achieved during the study period;

29.3. Cumulative (learning outcomes are assessed by interim tests), collegial (students are examined by a competent Commission of geoscientists–academics, professional practitioners, representatives of social partners), diagnostic (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) may be used to assess the student's achievements;

29.4. Assessment methods may include written and oral examination, course credit, test, practical training report and its defence, final thesis and its defence, colloquium, testing, individual or group project report, course work, collegial assessment of a research work;

29.5. At the beginning of the semester a lecturer shall inform students about the objectives of their studies, assessment procedure and system, assessment criteria and the weight of summative assessment parts.

29.6. Students shall receive adequate feedback information on their work performed. Students shall be given the opportunity to discuss with the evaluators on many aspects of their studies, including their assessments.

CHAPTER V REQUIREMENTS FOR IMPLEMENTATION OF STUDY PROGRAMMES

30. In order to implement study programmes of Geology, higher education institutions shall meet the following criteria:

30.1. Study programme shall take the form of a methodological framework of theoretical knowledge, practical skills and their application. It has to be relevant and consider the development of science of Geology, the needs of employers and career opportunities for graduates;

30.2. Objectives and intended learning outcomes of the study programme shall be clear and achievable and shall meet the programme title and description;

30.3. The study programme shall be based on relevant theory suitable for the objectives of the study programme. Graduating students shall be ready to adapt to the further development of geological science and the country's natural resources and economic potential.

31. Sufficient laboratory instructional material facilities and qualified teachers, conducting basic, applied research or experimental development analysis, aware of the conditions of future scientific, industrial or organisational work of the graduates and able to help students prepare for the future activities of a geologist shall be provided.

32. First and second cycle studies shall culminate in a final thesis (project) and its defence:

32.1. The final thesis (project) in the first cycle must be based on independent applied research, the application of knowledge, or be a project that demonstrates competences in line with the objectives of the programme. In the final thesis (project), the Bachelor student must demonstrate the level of knowledge and understanding, as well as the ability to analyse the chosen topic, evaluate the previous work of others in the field of study, carry out independent research in the field of study, describe the research work carried out, and formulate clearly and reasonably the conclusions of the research in accordance with the university's approved requirements;

32.2. The second cycle final thesis (project) shall be based on independent research or applied research, the application of knowledge, or be a project demonstrating competences in line with the programme objectives. In the final thesis (project), the Master student must demonstrate the level of knowledge and understanding, as well as the ability to analyse the chosen topic, evaluate the previous work of others in a specific field, carry out independent research in the that particular field of study, describe the research work carried out, and formulate clearly and reasonably the conclusions of the research and possible recommendations in accordance with the university's approved requirements;

32.3. The final thesis (project) must be assessed by a commission of competent professionals in the field of Geology - scientists, professional practitioners and representatives of potential employers. The chairperson of the commission must not be from the higher education institution the degree programme of which is being completed.

33. Persons holding a degree not lower than Master's degree or an equivalent qualification acquired in a higher education institution that corresponds to the study field of a taught study subject or Geology science shall teach study programmes of Geology. At least 50 percent of study field subjects shall be taught by scientists in the study programme of the first cycle studies. It is recommended that at least 80 percent of scientists whose scientific activities are in line with the

taught subject would teach the study subjects in the second cycle studies. The level of academic education of teachers, experience and efficiency in research projects, teaching experience and quality, level of research, reflected by the number of publications, implemented projects, participation in scientific conferences and scientific associations, personal interest in the students' needs and provision of constant academic support shall be assessed. Teachers shall be able to properly advise students on planning of studies and career; they need to know and understand the requirements applied to the study programmes of the study field of Geology.

34. Competent and recognised teachers of a certain field, holding a degree not lower than Master's degree or an equivalent qualification acquired in a higher education institution with at least 3 years of professional experience corresponding to the taught applied subjects, shall be invited to teach applied study subjects.

35. Consultations on study curriculum shall be provided by the teachers who teach appropriate subjects, supervisors of independent work, final theses (projects) and practical training, according to study plans or students' individual needs. Consultations shall be provided directly or virtually.

36. Implementation of the study programme shall require an appropriate material base:

36.1. Auditoriums, meeting hygiene and safety requirements and equipped with modern audio and video equipment, as well as demonstration tools;

36.2. Laboratories, equipped with the equipment providing the opportunity to study Geology field programmes (petrological, mineralogical, geophysical, hydrogeological, engineering geological, cartographic and other research instruments, computer programmes, GIS equipment, collections of minerals, rocks and palaeontological samples of a suitable size, etc.). Students shall be allowed to use laboratory equipment for individual research under the study plan;

36.3. Stationary and mobile bases of geological field practices with the necessary equipment and facilities;

36.4. Libraries with special literature, textbooks, abstracts of lessons, books, magazines and other literature funds, data bases, a sufficient number of computers with appropriate software (literature catalogues, search engines, link with databases of larger libraries, the Internet connection).

37. Academic support is provided to students in the following ways:

37.1. Teachers must encourage students to get involved in the scientific activities of the faculty or department;

37.2. Higher education institutions shall regularly provide advice on a wide range of issues relating to the planning and development of studies;

37.3. Higher education institutions shall provide students with special needs with opportunities to study;

37.4. Higher education institutions shall provide opportunities for students to organise cultural events on the premises of the higher education institution, to form and participate in clubs, societies and student organisations;

37.5. Higher education institutions shall provide opportunities for students to continuously improve their studies, to provide feedback to teachers and administrators, and to participate in curriculum committees and other higher education institution governing bodies.

38. The administration of a higher education institution shall ensure that students have access to the necessary career and finance management counselling and psychological support.

39. Students shall be informed about career opportunities and the possibility of receiving social scholarship and scholarship for academic achievements.

40. It is recommended to organise the educational field practice outside the territory of the Republic of Lithuania, in order to get students acquainted with the geological diversity of other regions, to gain knowledge in different geological environment than Lithuania. Students may be sent to perform professional practical training to enterprises with the advanced technological base.
