DETAILED PROPOSAL OF THE STUDY PROGRAMME

University of Zagreb

Faculty of Mining, Geology and Petroleum Engineering

University Bachelor Study Programme in Applied Geology and Geological Engineering

FORM 1

Zagreb, April 2022

University of Zagreb

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1. GENERAL INFORMATION ON THE STUDY PROGRAMME			
1.1. Name of the study programme	**Applied Geology and Geological Engineering**		
1.2. Provider of the study programme	Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb		
1.3. Partner institutions	-		
1.4. Type of study programme	Vocational study programme ☐		University study programme ☒
1.5. Level of study programme	Undergraduate ☒	Graduate ☐	Integrated ☐
1.6. Manner of implementation of the study programme	Classical ☒	Mixed (classical + online) ☐	Online in entirety ☐
1.6.1. Is it a?	☒single major ☐double major ☐interdisciplinary study ☐multidisciplinary study ☐developing programme		
1.7. Academic/vocational title earned at completion of the study	**Bachelor of Engineering in Geology, B.Eng. in Geology**		
1.8. Scientific/artistic field/area of the proposed study programme	**Scientific area of Technical Sciences/ Scientific field of Mining, Petroleum and Geological Engineering** **Scientific area of Natural Sciences/ Scientific field of Geology**		

2. INTRODUCTION		
2.1. Reasons for starting the study programme	Scientific need	Until the mid-1980s, geological research for the needs of groundwater exploitation, mineral and energy raw materials exploration and exploitation, environmental protection, construction of underground and above-ground buildings, belonged to the branch of geology called applied geology. Since then, a new scientific discipline, geological engineering, has developed, due to the growing need to apply engineering techniques and methods in implementing significant engineering interventions in the geological environment, such as drilling deep wells for groundwater or hydrocarbons. The first official definition of geological engineering was given by the American institution ABET (Accreditation Board for Engineering and Technology) in 1987. Geological engineering is defined as a professional activity and scientific discipline that applies geological knowledge to solve engineering and environmental problems. In the Republic of Croatia, Geological Engineering is classified by the Ordinance on scientific and artistic areas, fields and branches (OG 118/2009) into a scientific branch of the same name, within the scientific

		field Mining, Petroleum and Geological Engineering, within the scientific area of Technical Sciences. It includes specialist scientific disciplines: hydrogeology, engineering geology and applied geophysics. Theoretical principles of geological engineering are based on knowledge of geology, mathematics, chemistry, geophysics, fluid mechanics, soil mechanics and rock mechanics, and related scientific disciplines in the area of technical sciences which it partially overlaps. At the level of postgraduate studies, the acquisition of master's and doctoral degrees in the field of Technical Sciences, branch of Geological Engineering, has been possible since 2001 at the postgraduate scientific study of RGNF. In 2008, teaching began in doctoral studies harmonized with undergraduate and graduate study programs in accordance with the Bologna Declaration. In 2018, an amended doctoral study program was accredited, which includes the module Geological Engineering.
	Cultural need	The education of experts with a qualification in geological engineering is necessary for the development of an important part of technical culture. The Croatian Technical Heritage Portal, Croatian Technical Encyclopaedia, provides a summary of the development of geological engineering in the Republic of Croatia (https://tehnika.lzmk.hr/geolosko-inzenjerstvo/) related to the exploitation of mineral resources and water, as well as construction industry needs. Cultural needs arise from the basic task of technical culture, which is to raise the level of technological literacy of the population, especially young people. The planned university study program of Applied Geology and Geological Engineering will contribute to raising the level of technical culture related to technologies used for research of soil, rocks, water, hazardous natural processes (geohazards) and the natural environment, i.e. exploitation of water, minerals and geoenergy sources. Today, a wide range of technologies for remote sensing (from the ground and from the air), field research and laboratory research are used for these purposes.
	Social need	The societal needs to launch the proposed study program arise from the need for security as well as the need for education. The education of experts with a qualification in geological engineering contributes to the security of society by having qualified geological engineers forecasting and solving problems with natural disasters (earthquakes, floods, landslides and others). Also, geological engineering experts participate in the research of soil, water and air pollution, as well as in environmental protection by development and application of preventive and remedial measures. The education of geological engineering experts contributes to the education of society for a safe and sustainable way of life with respect to natural resources (land, water, geoenergy and mineral

		resources). In addition, bachelors of geological engineering are needed to continue their graduate education as experts in applied geosciences and geological engineering, as well as new technologies in this field, significantly contributing to development of society as a whole. The European Union has also recognized the importance of educating future engineering work force in the STEM field.
	Economic need	Hydrogeology studies groundwater, its origin, distribution, quality and available quantities. It uses knowledge of geological processes and materials, physical and mechanical properties of rocks and soils and hydrogeological, hydrogeochemical and hydrological parameters in order to determine the origin, flow dynamics and exploitation of groundwater reserves, as well as their optimal use and protection and remediation of polluted aquifers. Engineering geology studies geological structure, geological processes, mineralogical-petrographic and physical-mechanical characteristics of rocks and soils, surface water and groundwater for research, study and solving of engineering and environmental problems that may arise as a result of interaction between geological environment and various human activities (e.g. construction of underground and above-ground structures), i.e. for the purpose of forecasting and development of measures for prevention or remediation of geological hazards such as landslides, earthquakes, erosion and others. Geoenergy is focused on research of the Earth's energy sources; geothermal energy and fossil fuels, conventional and unconventional, thus having great importance on the security of energy supply. Also, geoenergy is engaged in research related to underground energy storage and carbon dioxide storage, which are essential technologies in the energy transition, as they enable the wider use of renewable energy sources and continued use of fossil fuels in industries where their use is irreplaceable. The geology of mineral resources studies mineral resources, their origin, distribution, quality and available quantities. It uses knowledge of geological processes and materials, physical and mechanical properties of rocks and soils and mineralogical, petrographic and geochemical parameters in order to determine the origin and enable exploitation of mineral resources, as well as assess their optimal use for industrial processing, production of building materials, architectural stone and metal. Environmental geology focuses on the research of environmental components (soil, water and air) and monitoring their condition in relation to pollution. Applied geophysics deals with the study of the Earth's crust using geophysical survey methods

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		based on observations of physical characteristics of rocks, such as: magnetic, electromagnetic, electrical, gravimetric, seismic reflection and refractive methods, etc. It is used in the study of hydrocarbons, solid minerals, exploitation reserves and pollution of groundwater and within engineering geological and geotechnical exploration works.
2.2. Assessment of the study programme's usefulness relative to the demands of the labour market in the public and private sectors	According to the Croatian Qualifications Framework (CROQF), the proposed study program belongs to the CROQF sector Mining, Geology and Chemical Technology, subsector Geology, CROQF level 6, and trains for occupation classes 2 and 3 (defined in the National Classification of Occupations). According to data from the CROQF portal from January 2022, number of occupations in the sector Geology for occupation classes 1 (directors and managers) and 2 (experts and scientists) is twice the number of study programs (10 educational programs), and for occupation classes 3 (engineers and technicians), 4 and 5 only one program is available. From this analysis of harmonization between occupation classes and CROQF levels, the demand for sectoral qualifications can be assessed. Data for *Geology* show that the analysed groups of occupation classes are not supported by appropriate educational programs. It is possible to conclude that employees with educational qualification of Bachelor of Science in Geology acquired their knowledge and skills through work experience and that the proposed educational program is necessary. In addition, the proposed study program will replace the existing University Undergraduate Study Program conducted at the Faculty of Mining, Geology and Petroleum Engineering since 2009 (undergraduate study program in Geological Engineering). The needs of the labour market for people who would complete the proposed study program can be observed at the regional level, as the proposed study program is the only one in the Republic of Croatia, and a similar one exists only in Serbia, if neighbouring countries are considered. Since students from neighbouring countries can also study in the Croatian language, the needs of the labour market can be extended to BiH and Slovenia. It is also assumed that the need for such a profile of experts will grow, both in the private and public sectors, primarily due to the needs of sustainable development and safe living, which is in line with global and European strategies.	
2.3. Compatibility of the study programme with the University mission and the strategy of the proposer, as well as with the Higher Education Institutions Network strategic plan	The proposed study program is in line with the mission of the University of Zagreb in the part related to the goals of development and change at the University, which is defined as follows: The University will develop study programs needed by society and economy, as well as study programs of national and strategic importance. The proposed study program is in line with the Development Strategy of the Faculty of Mining, Geology and Petroleum Engineering for the period 2017-2021, which states that the mission of the RGN Faculty is to educate competent experts in the field of geology and geological engineering. The same document states as the specific goal 1, related to the teaching process, the development of quality, attractive, relevant and competitive study programs in the Croatian language, which implies those based on learning outcomes that will meet the needs of the labour market and society as a whole in accordance with CROQF (sub-objective 1.1); increase the use of information and communication technologies in	

	the teaching process (sub-goal 1.2); and ensure the implementation of fieldwork and summer practice (sub-objective 1.8). The proposed study program is also in line with the strategic document of the Network of Higher Education Institutions, and represents a restructuring of the existing study program that belongs to two scientific fields (field of Geology and field of Mining, Petroleum and Geological Engineering). This study program is unique in the region and in the Republic of Croatia.
2.4. Comparability of the study programme with other accredited programmes in higher education institutions in the Republic of Croatia and the EU (name at least two programmes, one of which is from an EU country, and compare them with the proposed programme; provide internet addresses of the programmes)	To develop this study program, an analysis of six (6) accredited university undergraduate study programs in applied geology, and geological engineering conducted in Europe and the European Union (bold text) was performed. Study programs of the following universities were taken for comparison: **1) University of Leoben, Austria - Undergraduate Study of Applied Geosciences** (https://www.unileoben.ac.at/en/studying/undergraduate-studies/bsc-studies-raw-materials-energy/applied-geosciences) **(2) Jacobs University, Bremen, Germany - Undergraduate Study of Geosciences and Environmental Sciences** (https://www.jacobs-university.de/study/undergraduate/programs/earth-and-environmental-sciences); (**3) Lancaster University, England - Undergraduate Study of Earth and Environmental Sciences** (https://www.lancaster.ac.uk/study/undergraduate/courses/earth-and-environmental-science-bsc-hons-ff68/); (**4) University of St Andrews, Scotland - Undergraduate study of Environmental Earth Sciences** (https://www.st-andrews.ac.uk/subjects/earth-environmental-sciences/environmental-earth-sciences-bsc/); **(5) Jagiellonian University, Krakow, Poland - Undergraduate Study of Earth Sciences in a Changing World** (https://earthsciences.wgig.uj.edu.pl/); **(6) University of Miskolc, Hungary - Undergraduate study of Earth Science and Engineering** (http://mfk.uni-miskolc.hu/wp/en/?page_id=2639). All analysed study programs are university undergraduate programs of the first cycle because they precede the studies of the second cycle, followed by enrolment in the study of the third cycle (postgraduate study). They run for six (6) to eight (8) semesters for full-time study. Most of these studies end with the acquisition of 210 ECTS credits, and some of them are based on a total of 180 ECTS credits. All the mentioned undergraduate study programmes train students for educational qualifications (knowledge, skills) in the scientific branch of geological engineering, i. e. applied geology (which includes knowledge and skills in hydrogeology, engineering geology, geoenergy and/or geology of mineral resources and environment). All study programs are based on basic knowledge of chemistry, mathematics and physics in combination with geoscientific disciplines such as geology, mineralogy, petrology, and the use of methodological tools and concepts from geochemistry, geophysics, geological mapping and geodata analysis. Only a few of the analysed study programs offer the possibility of choosing between two or more modules (specializations) already at the undergraduate level,

	while others enable elective courses. From the analysis of the above six undergraduate studies, it follows that the proposed undergraduate study is the most similar to the 'Applied Geosciences' study programs of the University of Leoben (Austria) and the 'Geoscience Engineering' study of the University of Miskolc (Hungary). At the study in Leoben, elective courses are represented by 5%, because the total sum of optional/elective courses ECTS is 10.5 ECTS points. At the study in Miskolc, the elective rate is in the range of 3.8-5.6%, because the total sum of elective courses ECTS points can amount 8-12 ECTS points, and a total of 12 elective courses are offered. The proposed study program of one educational qualification achieves optionality by selecting elective courses but does not offer the option of choosing a module (specialization), which is foreseen in the second cycle, on the newly proposed graduate study. The proposed undergraduate study program offers a choice between 20 elective courses, of which two elective courses with 3 ECTS each are enrolled in the 3rd semester (a total of seven courses are offered); 2 elective courses of 5 ECTS are enrolled in the 4th semester (four courses are offered), as well as in the 5th semester (four courses are offered). In the 6th semester, two elective courses are enrolled, one with a work load of 4 ECTS (two courses are offered), and the other with 3 ECTS (three courses are offered). It follows that one of the recommendations stated in the Statute of the University of Zagreb, that as a rule elective courses should be represented by 15% of ECTS points, is satisfied, because students are obliged to enrol 33 ECTS points of elective courses out of a total of 180 ECTS points of the study program, which represents 18.33 %. This level of optionality is comparable to earlier mentioned similar studies at the universities in Leoben and Miskolc. Extensive mandatory learning outcomes result from the specificity of this study, which belongs to two scientific fields (natural and technical). Also, this study program continues in the second educational cycle as a university graduate study with four modules, two in the natural sciences and two in the technical sciences.
2.5. Openness of the study to student mobility (horizontal, vertical in the Republic of Croatia and international)	The proposed study program is largely comparable to the existing undergraduate study programs accredited for educational qualifications in hydrogeology, engineering geology, geoenergy, geology of mineral resources, environmental geology, geoengineering and applied geosciences conducted in the European Higher Education Area, i.e. in Europe. Given this fact, the future study program will ensure horizontal mobility with universities that have similar study programs, primarily the University of Leoben, Austria (undergraduate study of Applied Geosciences); Jacobs University, Germany (undergraduate study of Geosciences and Environmental Sciences); Jagiellonian University, Poland (undergraduate study of Earth Sciences in a Changing World); University of Miskolc, Hungary (undergraduate study of Earth Sciences and Engineering). Horizontal mobility in the Republic of Croatia is not possible, because there is no study program similar to the proposed one. Vertical mobility is ensured at the level of the Republic of Croatia and internationally, because students acquire a wide range of knowledge and skills that allow them to continue study in graduate studies in Geology, Civil Engineering, Geography, without or with only a few exams that are required due to program differences.

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2.6. Relationship with the local community (economy, entrepreneurship, civil society, etc.)	The connection between the proposed study program and the economy will be realized in a way that a certain part of the teaching but also field teaching will be held in cooperation with economic entities in the Republic of Croatia. In this way, cooperation with the economy will be ensured already during the studies, and it will continue for the purposes of preparing bachelor thesis, conducting research and collecting data within economic projects outside the faculty. The economic entities with which cooperation is planned are companies engaged in research for the needs of mining, energy, construction, water supply, water management and environmental protection.
2.7. Compatibility with the requirements of professional associations, if any exist	The professional association that covers the scientific field of Geology and the branch of Geological Engineering in the Republic of Croatia is the Croatian Geological Association (HGD) with six departments. The proposed study program is also in line with the requirements of the Croatian Association of Petroleum Engineers and Geologists (HUNIG) and the Croatian Association for Water Protection (HDZV), and partly with the requirements of the Croatian Association for Geotechnics (HGD). Of the international professional associations, the study program is in line with the requirements of the International Association of Hydrogeologists (IAH), the International Association of Engineering Geology (IAEG) and the European Association of Geoscientists and Engineers (EAGE). All these associations have an advisory role and serve to network experts who are educated in the proposed study program.
2.8. Name possible partners outside the higher education system	The most important partner outside the higher education system is expected to be the Croatian Geological Survey, which, through its scientific research and research projects, is a potential partner for professional internship and employment of students in European projects where students will be able to collaborate with colleagues studying similar study programs abroad, and their early career development. Cooperation with other scientific institutions is also expected, such as the Ruđer Bošković Institute, the Oceanographic Institute, the Institute of Archeology, the Hrvoje Požar Energy Institute and others. In addition to research institutes, partnerships are expected with public companies (eg. Croatian Waters) and industry (research, design and supervision activities in construction, mining, energy, environmental protection) related to professional internship and bachelor thesis of students. Possible partners are also administrations at the local (local self-government units, municipalities, cities), regional (counties) and state level (ministries), i.e. their administrative departments dealing with construction, spatial planning, environmental protection, water supply, mineral exploitation and energy. Namely, the educational qualification of the envisaged study program is necessary for the occupations of officials in the above-mentioned administrations, and it is expected that part of the professional internships/final exams will be organized with these partners as well.
2.9. Other (as the proposer wishes to add)	-

3. GENERAL INFORMATION	
3.1. Duration of the study programme (is there an option of distance learning, part-time studying, etc.)	The anticipated duration of the proposed study program is three (3) years, or six (6) semesters. The study is designed as full-time, and offers the possibility to perform certain activities in a particular course, depending on the number of

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	students enrolled in the course, to a lesser extent through online learning, or using e-learning features and tools. Due to the specifics of the study program in terms of a significant share of practical activities in the teaching process, there is no possibility of part-time study.
3.2. The minimum number of ECTS credits required for completion of study	For the successful completion of the proposed study program, it is necessary to achieve a minimum of 180 ECTS credits.
3.3. Enrolment requirements and admission procedure	The conditions for enrolment in the proposed study program are B-level mathematics, additional points for physics and chemistry will be awarded, and no enrolment exams will be conducted.
3.4. Language of the study programme	The proposed study program will be conducted entirely in Croatian.
3.5. Learning outcomes of the study programme relative to legislative acts, requirements of applicable professional associations, demands of the labour market, possibilities for continuation of education and general social needs (name 15-20 learning outcomes)	1) Apply basic knowledge of natural sciences (mathematics, physics and chemistry) and technical sciences in the analysis of geological systems 2) Use orthogonal and oblique projections of spatial objects and terrains and geodetic measurements in cartographic representations 3) Identify the main petrogenic and ore minerals, fossils, basic types of rocks and describe the way of their formation in order to understand the development of continents and oceans, plate tectonics and the development of life during the geological past 4) Determine geological boundaries, structures and structural relations and discontinuities, apply the principle of determining geological age and create a simple geological map, log plot and profile 5) Read topographic, general and specific geological maps and associated interpreters 6) Use GIS software for organization of geospatial data, spatial analysis and visualization 7) Use chemicals and equipment in accordance with good laboratory practice and apply standards for testing geological materials 8) Describe the types of aquifers and hydrogeological characteristics of rocks and construct head contour maps with determining the direction of groundwater flow for the purpose of exploitation and protection of water resources 9) Define endodynamic and exodynamic processes and phenomena and explain their impact on the relief with regard to the physical and mechanical properties of rocks for the purpose of engineering interventions in the environment 10) Describe the elements of the petroleum geology system and calculate the geological reserves of oil and / or natural gas based on isopach maps 11) Classify deposits of non-energetic mineral raw materials on the basis of mineral composition, structure and process of formation and bring their exploitation in the context of global resource needs 12) Determine the application of natural and crushed stone with regard to mineral-petrographic and physical-mechanical properties, and its durability 13) Choose the method of surface geophysical research (electrical, gravimetric, magnetometric and seismic) to define the geological structure and composition of the underground during the exploration of mineral resources and groundwater and detection of geohazards 14) Carry out geological, hydrogeological and engineering geological mapping, basic geological, shallow geophysical,

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	hydrogeological and engineering geological field measurements and sampling with the application of occupational safety measures 15) Critically assess the role of geosciences in solving social problems related to natural hazards, energetic and non-energetic geological resources, environmental pollution and global climate change 16) Systematize and consolidate the results of own observations in the field, laboratory and office, and prepare and present a complete report using other relevant data sources, citing them correctly 17) Communicate in speech and writing in standard Croatian and English (which includes geological and general technical and natural sciences terminology and basics of business communication) and use information and communication technology 18) Participate in the design of the goal, time and financial plan of the research and in the implementation of the project as part of the team
3.6. Evaluation of student employability at completion of the study programme, including opinions or official documents from three organizations associated with the labour market (e.g. professional associations or scientific institutions, employers or their associations, unions, public services, etc.) on the suitability of the anticipated learning outcomes to the demands of the labour market	Since the proposed study program belongs to the undergraduate programme of university studies and is primarily intended for students from the Republic of Croatia, it is to be expected that they will continue their education in the graduate study program and that very few will seek employment in Croatia. The assessment of the employability of the student after the completion of the planned study program was made based on the opinion of three organizations: (1) Geotehnički studio d.o.o. (potential employer); (2) Croatian Association of Petroleum Engineers and Geologists, HUNIG (professional association); (3) Croatian Geological Survey (scientific research institute, potential employer). According to the company Geotehnički studio d.o.o., for occupations of gender 3 (engineers) the study program provides students will be able to conduct work that is an integral part of engineering projects (field data collection, office and laboratory; data processing and analysis) in the domain of civil engineering based on 14 of the 18 outcomes. According to HUNIG for occupations of gender 3 (engineers) according to the study program, students will be trained to conduct work that is an integral part of engineering projects (data collection in the field, in the office and in the laboratory; data processing and analysis) based on 14 out of 18 outcomes. For jobs at the Croatian Geological Survey, the occupation that will be acquired through the planned study program is useful, and belongs to the CROQF subsector Geology. The undergraduate study program will train experts to conduct work that is part of scientific research (data collection in the field, in the office and in the laboratory; data processing and analysis), which are conducted at this survey in the scientific field of Geological Engineering and Geology. For sectoral occupation classes 3 (engineers) employable at the Croatian Geological Survey, all learning outcomes listed in point 3.5 are appropriate.
3.7. Possibilities of continuing studies at a higher level	Upon completion of the proposed study program, the student will gain the opportunity to continue his / her studies at a university graduate study level or specialist graduate study level in the Republic of Croatia or abroad.
3.8. Upon submitting proposals for graduate study programmes, name undergraduate studies of the proposer or other institutions in the Republic of Croatia that qualify for admission to the proposed graduate study	-

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4. DESCRIPTION OF THE STUDY PROGRAMME				
4.1. List of mandatory and elective courses and/or modules with class hours and ECTS credits (appendix: Table 1)				
4.2. Description of each course (appendix: Table 2)				
4.3. Structure of the study (number of semesters, trimesters, class sizes for lectures and exercises/seminars)	The proposed study program will be implemented as a three-year university undergraduate study program (six semesters) in which a total of 180 ECTS is required. All three years are common to all students. The number of students in lectures, classes and seminars is equal to the maximum number of students approved through the enrolment quota, while for the laboratory, practical and field exercises, and work in computer exercises will be determined in accordance with the Collective Contract for Science and Higher Education, as well as infrastructure and available space capacities of the Faculty. The enrolment quota for the proposed study program is 55 students, which means that this is the maximum number of students in lectures and that lectures are held in one group. The size of the groups for exercises is smaller and depends on the type of exercise. The proposed study program envisages the following types of exercises: auditory type of exercises, the group consists of up to 50 (+ 20%) students; computer exercises - the group consists of up to 15 (+ 20%) students; field exercises - the group consists of up to 15 (+ 20%) students; laboratory - laboratory exercises, the group consists of up to 10 (+ 20%) students; practicum - the group consists of up to 15 (+ 20%) students; project exercises - the group consists of up to 10 (+ 20%) students.			
4.4. Enrolment requirements for the following semester or trimester	An undergraduate student acquires the right to enrol in higher years of study if he / she has achieved at least 55 ECTS credits in the previous year.			
4.5. List of courses and/or modules offered in a foreign language (which language)	The proposed study program will be conducted entirely in Croatian.			
4.6. Completion of the study:				
a. Final requirement for completion of the study	Final thesis ☒	Diploma thesis ☐	Final exam ☒	Diploma exam ☐
b. Requirements for application of final/diploma thesis and/or final/diploma exam	With regular enrolment in the third year of study, the student automatically acquires the right to enrol the undergraduate thesis. The topic of the undergraduate thesis is chosen from the area covered by the study program, and is taken from the selected teacher at the beginning of the summer semester of the third year of undergraduate study.			
c. Evaluation procedure for final/diploma exam and evaluation and defence procedure for final/diploma thesis	In parallel with the fulfilment of his student obligations in the third year of the study program, the student prepares the undergraduate thesis. After fulfilling all student obligations according to the study program and collecting 174 ECTS credits, the student acquires the right to apply for the defence of the undergraduate thesis. A three-member committee consisting of a mentor and two members in the scientific-teaching status is appointed to evaluate the undergraduate thesis. After the committee members have read the final version of the undergraduate thesis and submitted their written remarks to the student, the student sends the corrected undergraduate thesis to the secretary of the Committee for the defence of undergraduate thesis, who checks the technical elements of the undergraduate thesis.			

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	When all the above conditions are met, a public defence of the undergraduate thesis is scheduled, chaired by the President of the Committee for the defence of undergraduate thesis. The Committee consists of the chairman of the committee and the committee that participated in the evaluation of undergraduate thesis. Public defence includes a 15-minute presentation of candidates, and an additional time of a maximum of 20 minutes to answer questions from members of the committee who participated in the evaluation of the undergraduate thesis. At the end of the defence, the members of the evaluation committee secretly evaluate the undergraduate thesis and the defence of the undergraduate thesis, after which the student is publicly informed of the cumulative grade and the undergraduate thesis defence grade. The entire process of defending the undergraduate thesis ends with a public reading of the minutes from the defence of the undergraduate thesis signed by the president and all members of the committee.