MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY

"DNIPRO POLYTECHNIC"

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|  | APPROVED  by the Academic Council of the University  Chairman of the Academic Council  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_G.G. Pivnyak  «\_\_\_»\_\_\_\_\_\_\_\_\_\_\_ 2020,  protocol № \_\_\_\_\_\_ |

**EDUCATIONAL PROFESSIONAL PROGRAM OF HIGHER EDUCATION**

**"Geology"**

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| --- | --- |
| FIELD OF KNOWLEDGE | 10 Natural Science |
| SPECIALTY | 103 Earth Sciences |
| LEVEL OF HIGHER EDUCATION | First |
| DEGREE | Bachelor |
| EDUCATIONAL QUALIFICATION | Bachelor of Earth Sciences |

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|  | Put into effect from 01.09.2020  Rector  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ G.G. Pivnyak  Order of \_\_.\_\_.2020 №\_\_\_ |

Dnipro

NTU «DP»

2020

PREFACE

Developed by a working group consisting of:

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# INTRODUCTION

The educational and professional program is developed on the basis of the Standard of higher education of preparation of bachelors in the specialty 103 Earth Sciences.

*The educational and professional program is used during:*

- licensing of the specialty and accreditation of the educational program;

- drawing up curricula;

- formation of working programs of academic disciplines, practices, individual tasks;

- formation of individual curricula of students;

- development of diagnostic tools for the quality of higher education;

- certification of bachelors majoring in 103 Earth Sciences;

- determining the content of training in the system of retraining and advanced training;

- professional orientation of applicants for the specialty;

- external quality control of training.

*Users of the educational and professional program:*

- applicants for higher education who study at NTU "DP";

- teachers of NTU "DP", which provide training for bachelors majoring in 103 Earth Sciences;

- examination commission of specialty 103 Earth Sciences;

- Admissions Committee of NTU "DP".

The educational and professional program extends to the departments of the university, which participate in the training of specialists with a Bachelor's degree in 103 Earth Sciences.

# 1 PROFILE OF THE EDUCATIONAL PROGRAM

|  |  |
| --- | --- |
| **1.1 General information** | |
| Full name of the institution of higher education and institute (faculty) | National Technical University "Dnipro Polytechnic", Faculty of Geological Exploration |
| Higher education degree and title of qualification in the original language | Бакалавр з наук про Землю / Bachelor of Earth Sciences |
| The official name of the educational program | Geology |
| Type of diploma and scope of educational program | Bachelor degree, single, 240 ECTS credits,  term of study 3 years 10 months – on the basis of complete secondary education. 2 years 10 months – on the basis of educational level of the junior specialist. |
| Availability of accreditation | The program was not accredited |
| Cycle / level | National qualifications framework of Ukraine – level 6 , FQ-EHEA – the first cycle, ЕQF-LLL – level 6 |
| Prerequisites | Availability of complete general secondary education |
| Language (s) of instruction | Ukrainian, English |
| Term of the educational program | The term may not exceed 3 years 10 months and / or the accreditation period.  The educational program is subject to revision in accordance with changes in the regulatory framework of Ukraine in the field of higher education at least once a year. |
| Internet address of the permanent placement of the educational program description | Information packages by specialty:  <http://gppkk.nmu.org.ua/ua/>,  <http://gig.nmu.org.ua/ua/>,  <http://gmr.nmu.org.ua/ua/>.  Educational programs of NTU "DP":  <http://www.nmu.org.ua/ua/content/infrastructure/structural_divisions/science_met_dep/educational_programs/>. |
| **1.2 The purpose of the educational program** | |
| Training of competitive specialists in the labor market, able to solve the problems of studying the structure of the Earth: geological study of territories and mineral deposits, research of soil massifs and groundwater using geological, hydrogeological and geophysical research methods. | |
| **1.3 Characteristics of the educational program** | |
| Subject area | 10 Natural Sciences / 103 Earth Sciences / Geology  **Object of study and activity:** natural and anthropogenic objects, processes and phenomena in the lithosphere and underground hydrosphere, their relationship, transformation and development in space and time.  **The purpose of education:** the formation of higher education students' ability to solve geological problems of Earth sciences and practical problems in the process of professional activity or training, which involves the application of theories and methods of Earth sciences, which are characterized by complexity and uncertainty of conditions. The training is aimed primarily at solving regional problems of the geological structure of the Middle Dnieper and Western Donbass to provide raw materials for the region's industrial base, groundwater resources and justification of engineering protection measures, taking into account the significant geological-hydrogeological-geophysical potential of human and technological resources.  **Theoretical content of the subject area:** knowledge of the structure, shape, composition, origin, development of the Earth as a whole and the phenomena and processes occurring in it. Basic knowledge of natural sciences, mathematics and information technology to the extent necessary for the study of natural and anthropogenic objects and processes.  **Methods, techniques and technologies:** methods of full-scale, direct and indirect research, direct laboratory testing and remote sensing of objects, processes and phenomena in the lithosphere and underground hydrosphere, methods of modeling and analysis of information.  **Tools and equipment:** equipment and facilities necessary for field, laboratory and remote research of the composition, structure and properties of the lithosphere, underground hydrosphere and their components. |
| Orientation of the educational program | The educational and professional program for the bachelor has an applied orientation. The program is based on well-known scientific results, taking into account the current state of geology, focuses on current specializations, within which further professional and scientific activities are possible: geology, hydrogeology, engineering geology, geophysics. |
| The main focus of the educational program | Special education in the field of Natural Sciences / Earth Sciences focuses on the formation of professionals capable of geological and geophysical surveying of territories, search and exploration of mineral deposits, to develop projects for geological study of subsoil and water well projects, to conduct engineering and geological surveys for construction and monitoring of groundwater regime, to carry out geophysical studies of the lithosphere.  Key words: geological structure of the Earth, mineral deposits, hydrogeological conditions, geophysical researches, engineering-geological conditions. |
| Features of the program | Interdisciplinary and multidisciplinary training aimed at developing knowledge and skills of modern methodology of geological work and other necessary competencies to solve experimental and practical problems; enhanced practical geological training; possible academic mobility and internships in educational institutions abroad. A feature of the program is the acquisition of practical skills in special practices and workshops. |
| **1.4 Suitability of graduates for employment and further study** | |
| Suitability for employment | Types of economic activity according to the classifier of types of economic activity State Classifier 009:2010:  Section B Chapter 09 "Provision of ancillary services in the field of mining and quarrying";  Section M Chapter 71 “Activities in the fields of architecture and engineering; technical tests and research":  71.12 Activities in the field of engineering, geology and geodesy, providing technical consulting services in these areas. |
| Further training | Opportunity to study at qualification levels: National qualifications framework of Ukraine – level 8 , FQ-EHEA – the second cycle, EQF-LLL – level 7. |
| **1.5 Teaching and assessment** | |
| Teaching and learning | Student-centered learning, based on competence and activity approaches, active self-learning, learning through educational and undergraduate practice. Active (problem, interactive, design, information-computer, self-developing) and passive (explanatory-illustrative) technologies and methods. |
| Evaluation | Assessment of students’ achievement is carried out on a rating scale (passing scores 60… 100) and on an institutional scale ("excellent", "good", "satisfactory", "unsatisfactory"), which is used to convert grades of mobile students.  Assessment includes the full range of control procedures depending on the competency characteristics (knowledge, skills, communication, autonomy and responsibility) of learning outcomes, the achievement of which is monitored.  The student’s learning outcomes, which reflect the achieved level of competencies relative to the expected ones, are identified and measured during the control activities using criteria that correlate with the descriptors of the National Qualifications Framework and characterize the ratio of competency requirements and rating indicators.  Final control in academic disciplines is carried out based on the results of current control and / or evaluation of complex control work and / or oral answers. |
| Form of final certification | Certification is carried out in the form of public defense of the bachelor’s thesis.  Qualification work should involve solving a complex specialized problem or practical problem in the subject area of Earth sciences, characterized by complexity and uncertainty of conditions, using theories and methods of geology, geophysics or hydrogeology.  Qualification work should not contain academic plagiarism, fabrication and falsification. The work is checked for plagiarism in accordance with the procedure defined by the system of quality assurance of educational activities and the quality of higher education by the university.  Qualification work should be placed in the depositary of the Free Economic Zone.  The defense of the qualification work takes place in public at the meeting of the examination commission. |
| **1.6 Resource support for program implementation** | |
| Specific characteristics of staffing | Staffing meets the license conditions. Project group: 3 doctors of Geol. Science, 2 Ph.D. Geol. Science. Guarantor of the program - Prikhodchenko V.F., doctor of Geol. Science. Mainly, teachers are staff members of the university, have a degree and / or academic title that corresponds to the main profile of the discipline taught, have a proven level of scientific and professional activity. All teachers undergo advanced training every five years at geological enterprises and scientific organizations. |
| Specific characteristics of material and technical safety | Material and technical support of the educational program "Geology" allows to perform laboratory and scientific research in the structural units of the National Technical University "Dnipro Polytechnic", which include:   * specialized laboratories for studying the composition, structure and properties of the Earth’s geospheres; * optical microscopes for petrographic and mineralographic studies of mineral resources; * equipment and devices for determining the water-physical and physical-mechanical properties of soils; * geophysical equipment for measuring geophysical fields and studying the physical properties of rocks; * bases for internships (under cooperation agreements).   There are classrooms, laboratories, computer classes, dormitories, food outlets, wireless internet access points, gyms, etc. The provision of training facilities, computer workstations, multimedia equipment meets the needs. |
| Specific characteristics of information and educational and methodical support | Official websites of the university ([http://www.nmu.org.ua](http://www.nmu.org.ua/)), geological exploration faculty (<http://grf.nmu.org.ua/ua>) and graduating departments: geology and exploration of mineral deposits (<http://gppkk.nmu.org.ua/ua/>), hydrogeology and engineering geology (<http://gig.nmu.org.ua/ua/>), geophysical methods of exploration (<http://gmr.nmu.org.ua/ua/>) contain information about educational programs, educational and scientific activities, structural units, admission rules, contacts, educational resources (materials of educational and methodological support). Unlimited access to the Internet, printed (Science Library funds, depository, libraries of training laboratories) and Internet sources (including the University e-Learning Center) of information; curricula and work plans (along with explanatory notes to them), educational programs, work programs of disciplines and practices, educational and methodical complexes of disciplines, including lecture material, tasks of practical works, questions of seminars, tasks of independent work, questions, tasks and assignments for current and final control meet the license conditions, 100%. |
| **1.7 Academic mobility** | |
| National credit mobility | Possibility of conclusion of agreements on academic mobility, double certification, etc. Credits received at other universities of Ukraine may be credited, provided that the acquired competencies correspond. |
| International credit mobility | Possibility of concluding agreements on international mobility, on double certification, on long-term international projects involving student training, etc. It is allowed to accept credits obtained in foreign universities, provided that the acquired competencies correspond.  Agreements on international mobility have been concluded with the University of Miskolc (Hungary), under the Erasmus+ K107 program, with the Faculty of Geosciences of the Ruhr University and the Technical School named after Georg Agricola, Bochum (Germany). |
| Training of foreign applicants for higher education | Citizens of other countries are admitted to study in the specialty 103 "Earth Sciences", educational program "Geology", on the basis of international agreements on the terms specified in these agreements, as well as agreements concluded by educational institutions with foreign educational institutions, organizations or by individual agreements, contracts. Training is conducted on general terms or on an individual schedule. |

# 2 MANDATORY COMPETENCES

Integral competence of the bachelor in the specialty 103 Earth Sciences - the ability to solve complex geological problems and practical problems in the professional activity of the subject area of Earth Sciences or in the learning process using modern theories and methods of research of natural and anthropogenic objects and processes using the complex interdisciplinary data and in conditions of lack of information.

2.1 General competencies according to the standard of higher education

|  |  |
| --- | --- |
| **Code** | **Competencies** |

| ***1*** | ***2*** |
| --- | --- |
| К01 | The ability to exercise one’s rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine. |
| К02 | Ability to preserve and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, machinery and technology, use different types of physical activity and lead a healthy lifestyle. |
| К03 | Ability to apply knowledge in practical situations. |
| К04 | Knowledge and understanding of the subject area and understanding of professional activity. |
| К05 | Ability to communicate in the state language both orally and in writing. |
| К06 | Ability to communicate in a foreign language. |
| К07 | Skills in the use of information and communication technologies. |
| К08 | Ability to learn and master modern knowledge. |
| К09 | Ability to work in a team. |
| К10 | Life safety skills. |
| К11 | The aspiration to preserve the natural environment. |
| К12 | Ability to act on the basis of ethical considerations (motives). |

2.2 Special competencies

The generalized object of professional activity is natural and anthropogenic objects, processes and phenomena in the lithosphere and underground hydrosphere, their interrelation, transformation and development in space and time.

2.2.1 Special competencies according to the standard of higher education

|  |  |
| --- | --- |
| **Code** | **Competencies** |

| ***1*** | ***2*** |
| --- | --- |
| К13 | Knowledge and understanding of the theoretical foundations of the Earth sciences as a complex natural system. |
| К14 | Ability to apply basic knowledge of physics, chemistry, biology, ecology, mathematics, information technology, etc. in the study of the Earth and its geospheres. |
| К15 | Ability to collect, register and analyze data using appropriate methods and technological tools in the field and laboratory. |
| К16 | Ability to apply quantitative methods in the study of geospheres. |
| К17 | Ability to comprehensively analyze the composition and structure of geospheres. |
| К18 | Ability to integrate field and laboratory observations with theory in sequence: from observation to recognition, synthesis and modeling. |
| К19 | Ability to monitor natural processes. |
| К20 | Ability to independently investigate the geological properties of rocks, minerals and groundwater in the field and laboratory, to describe, analyze, document and report the results. |
| К21 | Ability to plan, organize and conduct research and prepare reports. |
| К22 | The ability to identify and classify known and register new objects in the geospheres, their properties and their inherent processes. |

2.2.2 Special competencies taking into account the peculiarities of the educational program

|  |  |
| --- | --- |
| **Code** | **Competencies** |

| ***1*** | ***2*** |
| --- | --- |
| СК01 | Ability to perform geological and economic assessment of mineral deposits. |
| СК02 | Ability to perform hydrogeological research and use its results to study natural and anthropogenic objects and processes in the underground hydrosphere. |
| СК03 | Ability to perform engineering geological studies and use their results to assess the state of natural and anthropogenic objects and processes in the lithosphere and underground hydrosphere. |
| СК04 | Ability to perform geophysical research and use geophysical data to study natural objects and processes in the lithosphere and underground hydrosphere. |

# 

# 3 NORMATIVE CONTENT OF TRAINING, FORMULATED IN TERMS OF LEARNING OUTCOMES

The final and integrative learning outcomes of the bachelor training in the specialty 103 Earth Sciences, which determine the normative content of training and correlate with the list of general and special competencies in accordance with the standard of higher education, are given below.

| **Code** | **Learning outcomes** |
| --- | --- |

| ***1*** | ***2*** |
| --- | --- |
| ***Program learning outcomes*** | |
| ПР01 | Collect, process and analyze information in the field of Earth sciences. |
| ПР02 | Use professional Ukrainian orally and in writing. |
| ПР03 | Communicate in a foreign language with professionals. |
| ПР04 | Use information technology, cartographic and geoinformation models in the field of Earth sciences. |
| ПР05 | Be able to conduct field and laboratory research. |
| ПР06 | Determine the main characteristics, processes, history and composition of the Earth as a planetary system and its geospheres. |
| ПР07 | Apply models, methods and data of physics, chemistry, biology, ecology, mathematics, information technology, etc. in the study of natural processes of formation and development of geospheres. |
| ПР08 | Justify the choice of field and laboratory methods and use them for the analysis of natural and anthropogenic systems and objects. |
| ПР09 | Be able to perform research on geospheres using quantitative methods of analysis. |
| ПР10 | Analyze the composition and structure of geospheres on different spatiotemporal scales. |
| ПР11 | Put in order and summarize materials for field and laboratory research. |
| ПР12 | Know and apply theories, paradigms, concepts and principles in the Earth sciences to study the lithosphere and underground hydrosphere. |
| ПР13 | Be able to communicate the results of activities to a professional audience and the general public, make presentations and notification. |
| ПР14 | Participate in the development of projects and practical recommendations in the field of Earth sciences. |
| ПР15 | Be able to choose the best methods and tools for research, data collection and processing. |
| ***Special learning outcomes taking into account the peculiarities of the educational program*** | |
| СР01 | Be able to perform geological and economic assessment of mineral deposits. |
| СР02 | Perform hydrogeological research and use their results to study natural and anthropogenic objects and processes in the underground hydrosphere. |
| СР03 | Perform engineering geological research and use their results to assess the state of natural and anthropogenic objects and processes in the lithosphere and underground hydrosphere |
| СР04 | Perform geophysical research and use geophysical data to study natural objects and processes in the lithosphere and underground hydrosphere. |

# 4 DISTRIBUTION OF LEARNING OUTCOMES BY EDUCATIONAL COMPONENTS

|  |  |  |
| --- | --- | --- |
| **Code** | **Learning outcomes** | **Names of educational components** |

| ***1*** | ***2*** | ***3*** |
| --- | --- | --- |
| **1 MANDATORY PART** | | |
| ***Program learning outcomes*** | | |
| ПР01 | Collect, process and analyze information in the field of Earth sciences. | Ф1 General geology;  Ф4 Structural geology and geomapping;  Ф6 Historical geology;  Ф12 Quaternary geology with the basics of geomorphology;  C1 Hydrogeology;  C2 Geophysical research methods;  C3 Engineering geology;  П1 Educational geological practice with the use of topographic methods;  П2 Comprehensive training practice in geological surveying;  П3 Comprehensive training practice in the specialty;  П4 Pre-certification practice;  KР1 Performing qualifying work for the degree. |
| ПР02 | Use professional Ukrainian orally and in writing. | З2 Ukrainian language;  З5 Specialist’s value competencies. |
| ПР03 | Communicate in a foreign language with professionals. | З3 Foreign language for professional purposes (English / German / French). |
| ПР04 | Use information technology, cartographic and geoinformation models in the field of Earth sciences. | Б3 Computer Science;  Ф3 Geodesy with the basics of topography and cartography;  Ф4 Structural geology and geomapping;  Ф9 Statistical methods in geology;  Ф10 Geological informatics and geodata processing;  С4 Geological and economic assessment of deposits. |
| ПР05 | Be able to conduct field and laboratory research. | Ф2 Mineralogy;  Ф3 Geodesy with the basics of topography and cartography;  Ф4 Structural geology and geomapping;  Ф5 Petrography and lithology;  Ф8 Geological exploration;  Ф11 Geochemistry and geoecology;  C3 Engineering geology;  П1 Educational geological practice with the use of topographic methods;  П2 Comprehensive training practice in geological surveying;  П3 Comprehensive training practice in the specialty. |
| ПР06 | Determine the main characteristics, processes, history and composition of the Earth as a planetary system and its geospheres. | Ф1 General geology;  Ф6 Historical geology;  Ф7 Geology of mineral deposits;  Ф12 Quaternary geology with the basics of geomorphology;  Ф13 Geology of oil and gas fields;  Ф14 Geotectonics;  Ф15 Regional geology;  Ф16 Physics of the Earth;  C1 Hydrogeology;  C2 Geophysical research methods;  C3 Engineering geology. |
| ПР07 | Apply models, methods and data of physics, chemistry, biology, ecology, mathematics, information technology, etc. in the study of natural processes of formation and development of geospheres. | Б1 Higher mathematics;  Б2 Physics;  Б3 Informatics;  Б4 Chemistry;  Ф7 Geology of mineral deposits;  Ф10 Geological informatics and geodata processing;  Ф11 Geochemistry and geoecology;  Ф13 Geology of oil and gas fields.  F16 Physics of the Earth;  C1 Hydrogeology;  C2 Geophysical research methods. |
| ПР08 | Justify the choice and use field and laboratory methods for the analysis of natural and anthropogenic systems and objects. | Ф2 Mineralogy;  Ф4 Structural geology and geomapping;  Ф5 Petrography and lithology;  Ф8 Geological exploration;  C3 Engineering geology;  C4 Geological and economic assessment of deposits;  П1 Educational geological practice with the use of topographic methods;  КР1 Performing qualifying work for the degree. |
| ПР09 | Be able to perform research on geospheres using quantitative methods of analysis. | Ф9 Statistical methods in geology;  Ф10 Geological informatics and geodata processing;  Ф11 Geochemistry and geoecology;  Ф13 Geology of oil and gas fields;  C2 Geophysical research methods;  C4 Geological and economic assessment of deposits;  П1 Educational geological practice with the use of topographic methods;  КР1 Performing qualifying work for the degree. |
| ПР10 | Analyze the composition and structure of geospheres on different spatiotemporal scales. | Ф1 General geology;  Ф4 Structural geology and geomapping;  Ф5 Petrography and lithology;  Ф6 Historical geology;  Ф7 Geology of mineral deposits;  Ф14 Geotectonics;  Ф15 Regional geology;  Ф16 Physics of the Earth  C1 Hydrogeology;  C3 Engineering geology. |
| ПР11 | Put in order and summarize materials for field and laboratory research. | С3 Engineering geology;  С4 Geological and economic assessment of deposits;  П3 Comprehensive training practice in the specialty;  П4 Pre-certification practice;  КР1 Performing qualifying work for the degree. |
| ПР12 | Know and apply theories, paradigms, concepts and principles in the Earth sciences to study the lithosphere and underground hydrosphere. | Ф7 Geology of mineral deposits;  Ф11 Geochemistry and geoecology;  Ф13 Geology of oil and gas fields;  Ф14 Geotectonics;  Ф15 Regional geology;  Ф16 Physics of the Earth.  C1 Hydrogeology;  C2 Geophysical research methods;  С3 Engineering geology. |
| ПР13 | Be able to communicate the results of activities to a professional audience and the general public, make presentations and notification. | З5 Specialist’s value competencies;  П4 Pre-certification practice;  КР1 Performing qualifying work for the degree. |
| ПР14 | Participate in the development of projects and practical recommendations in the field of Earth sciences. | П4 Pre-certification practice;  КР1 Performing qualifying work for the degree. |
| ПР15 | Be able to choose the best methods and tools for research, data collection and processing. | Ф4 Structural geology and geomapping;  Ф11 Geochemistry and geoecology;  Ф13 Geology of oil and gas fields;  C1 Hydrogeology;  C2 Geophysical research methods;  C3 Engineering geology;  С4 Geological and economic assessment of deposits;  П4 Pre-certification practice;  КР1 Performing qualifying work for the degree. |
| ***Special learning outcomes taking into account the peculiarities of the educational program*** | | |
| СР01 | Be able to perform geological and economic assessment of mineral deposits. | С4 Geological and economic assessment of deposits.  П5 Performing qualifying work for the degree. |
| СР02 | Perform hydrogeological research and use their results to study natural and anthropogenic objects and processes in the underground hydrosphere. | С1 Hydrogeology.  П5 Performing qualifying work for the degree. |
| СР03 | Perform engineering geological research and use their results to assess the state of natural and anthropogenic objects and processes in the lithosphere and underground hydrosphere | С1 Hydrogeology.  C3 Engineering geology.  П5 Performing qualifying work for the degree. |
| СР04 | Perform geophysical research and use geophysical data to study natural objects and processes in the lithosphere and underground hydrosphere. | С2 Geophysical research methods.  П5 Performing qualifying work for the degree. |
| **2 SELECTIVE PART**  **It is determined by students' choice of academic disciplines from a list** | | |

**5 DISTRIBUTION OF THE SCOPE OF THE PROGRAM BY EDUCATIONAL COMPONENTS**

| **Code** | **Educational component** | **Amount, credit** | **The result. control** | **Department that teaches** | **Distribution by academic quarters** |
| --- | --- | --- | --- | --- | --- |

| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** |
| --- | --- | --- | --- | --- | --- |
| **1** | **MANDATORY PART** | **180** |  |  |  |
| **1.1** | **General training cycle** | **30** |  |  |  |
| З1 | Civilization processes in Ukrainian society | 3.0 | credit | HPT | 1 |
| З2 | Ukrainian language | 3.0 | exam | PLC | 3 |
| З3 | Foreign language for professional purposes (English / German / French) | 6.0 | exam | FL | 1;2;3;4 |
| З4 | Physical culture and sport | 6.0 | credit | PC | 1;2;3;4;5;6;7;8 |
| З5 | Specialist’s value competencies | 6.0 | exam | PP | 5;6 |
| З6 | Science of law | 3.0 | credit | CCEL | 11 |
| З7 | Civil security | 3.0 | exam | LS and CS | 13 |
| **1.2** | **Cycle of special training** | **150** |  |  |  |
| **1.2.1** | ***Basic disciplines in the field of knowledge*** | **22** |  |  |  |
| Б1 | Higher mathematics | 8.0 | exam | HM | 1;2;3;4 |
| Б2 | Physics | 5.0 | exam | Physics | 3;4 |
| Б3 | Computer Science | 4.0 | exam | IT and CE | 1;2 |
| Б4 | Chemistry | 5.0 | exam | Chemistry | 1;2 |
| **1.2.2** | ***Professional educational components by specialty*** | **79,5** |  |  |  |
| Ф1 | General geology | 6.0 | credit | GSG | 3;4 |
| Ф2 | Mineralogy | 7.0 | exam | G and MP | 3;4 |
| Ф3 | Geodesy with the basics of topography and cartography | 4.0 | exam | Geod. | 1;2 |
| Ф4 | Structural geology and geomapping | 6.0 | exam | GSG | 7;8 |
| Ф5 | Petrography and lithology | 8.0 | exam | G and MP | 5;6;7;8 |
| Ф6 | Historical geology | 3.0 | credit | G and MP | 5;6 |
| Ф7 | Geology of mineral deposits | 6.0 | exam | G and MP | 7;8 |
| Ф8 | Geological exploration | 3.0 | credit | OGE and D | 8 |
| Ф9 | Statistical methods in geology; | 4.0 | credit | GME | 5;6 |
| Ф10 | Geological informatics and geodata processing | 8.0 | exam | H and EG | 7;8;9;10 |
| Ф11 | Geochemistry and geoecology | 4.0 | exam | G and MP | 9;10 |
| Ф12 | Quaternary geology with the basics of geomorphology | 4.0 | credit | G and MP | 11;12 |
| Ф13 | Geology of oil and gas fields | 3.5 | credit | G and MP | 11;12 |
| Ф14 | Geotectonics | 4.0 | exam | G and MP | 15 |
| Ф15 | Regional geology | 4.0 | exam | G and MP | 15 |
| Ф16 | Physics of the Earth | 4.0 | credit | GME | 15 |
| **1.2.3** | ***Special educational components of the educational program*** | **19,5** |  |  |  |
| С1 | Hydrogeology | 5.0 | exam | H and EG | 5;6 |
| С2 | Geophysical research methods | 6.0 | exam | GME | 7;8 |
| С3 | Engineering geology | 3.5 | exam | H and EG | 9;10 |
| С4 | Geological and economic assessment of deposits. | 4.0 | credit | G and MP | 15 |
| **1.2.4** | ***Practical training in the specialty and certification*** | 30 |  |  |  |
| П1 | Educational geological practice with the use of topographic methods; | 6.0 | credit | GSG | 4 |
| П2 | Comprehensive training practice in geological surveying | 3.0 | credit | GSG | 8 |
| 3.0 | G and MP |
| П3 | Comprehensive training practice in the specialty | 6.0 | credit | G and MP | 12 |
| H and EG |
| GME |
| П4 | Pre-certification practice | 3.0 | credit | G and MP, H and EG, ГМР | 16 |
| КР | Performing qualifying work for the degree | 9.0 | credit | G and MP, H and EG, GME | 16 |
| **2** | **SELECTIVE PART** | **61,5** |  |  |  |
| **The list of academic disciplines is determined by students' choice** | | | | | |
| **General and selective parts, total** | | **240.0** |  |  |  |

**Note:**

Designation of departments entrusted with the teaching of disciplines: LS and CS - Labor Safety and Civil Security; HM – Higher Mathematics; HEG – Hydrogeology and Engineering Geology; Geod. – Geodesy; G and MP – Geology and Mineral Prospecting; GSG — General ans Stractural Geology; GM – Geophysical Methods; FL – Forein Languages; HPT – History and Political Theory; PC – Physical Culture; OGE and D – Oil-and-Gas Engineering and Drilling; PLC – Philology and Language Communication; PP – Philosophy and Pedagogics; CCEL – Civil, Economic and Environmental Law; IT and CE — Information Technolofy and Computer Engeneering.

# 6 STRUCTURAL AND LOGICAL SCHEME

The sequence of the student’s full-time study activities is given below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year of study** | | **Semester** | | **Quarter** | **Codes of educational components** | **Annual volume, credits** | **Number of disciplines taught during** | | |
| **quarter** | **semester** | **academic year** |
| ***1*** | ***2*** | | ***3*** | | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** |
| 1 | 1 | | 1 | | З1, З3, З4, Б1,Б3, Б4, Ф3 | 60 | 7 | 7 | 12 |
| 2 | | З3, З4, Б1,Б3, Б4, Ф3 | 6 |
| 2 | | 3 | | З2, З3, З4, Б1, Б2, Ф1,Ф2 | 7 | 8 |
| 4 | | З3, З4, Б1, Б2, Ф1, Ф2, П1 | 7 |
| 2 | 3 | | 5 | | З4, З5, Ф5, Ф9,С1 | 60 | 5 | 6 | 12 |
| 6 | | З4, З5, Ф5,Ф6, Ф9,С1 | 6 |
| 4 | | 7 | | З4, Ф4, Ф5, Ф7, Ф10, С2 | 6 | 8 |
| 8 | | З4, Ф4, Ф5, Ф7, Ф8, Ф10,С2, П2 | 8 |
| 3 | 5 | | 9 | | Ф10, Ф11, В1, В2, В3, С3 | 60 | 6 | 6 | 16 |
| 10 | | Ф10, Ф11, В1, В2, В3, С3 | 6 |
| 6 | | 11 | | З6, Ф12, Ф13, В4, В5, В6, В7, В8 | 8 | 10 |
| 12 | | Ф12, Ф13, В4, В5, В6, В7, В8, В9, П3 | 9 |
| 4 | 7 | | 13 | | З7, В10, В11, В12, В13, В14, В17 | 60 | 7 | 8 | 16 |
| 14 | | В10, В11, В12, В13, В14, В18 | 6 |
| 8 | | 15 | | Ф14, Ф15, Ф16, С4, В15, В16 | 6 | 8 |
| 16 | | П4, КР1 | 2 |

**Note**:

Denotements В1, В2, …, В18 – educational components of student’s choice: “soft-skills” disciplines (three disciplines for four credits), professional disciplines (12 disciplines for four credits), professional course projects (works) (three disciplines for 0,5 credit).

# 7 CORRESPONDENCE MATRIX

Table 1. Matrix of correspondence of the results of training defined by the educational program to components of the educational program

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Components of the educational program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| З1 | З2 | З3 | З4 | З5 | З6 | З7 | Б1 | Б2 | Б3 | Б4 | Ф1 | Ф2 | Ф3 | Ф4 | Ф5 | Ф6 | Ф7 | Ф8 | Ф9 | Ф10 | Ф11 | Ф12 | Ф13 | Ф14 | Ф15 | Ф16 | С1 | С2 | С3 | С4 | П1 | П2 | П3 | П4 | П5 | КР1 |
| Learning outcomes | ПР01 |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** |  |  |  | **•** | **•** | **•** |  |  |  |  | **•** |  |  |  |  | **•** | **•** | **•** |  | **•** | **•** | **•** | **•** | **•** | **•** |
| ПР02 |  | **•** |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ПР03 |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ПР04 |  |  |  |  |  |  |  |  |  | **•** |  |  |  | **•** |  | **•** |  |  |  | **•** | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ПР05 |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  |  | **•** |  |  | **•** |  |  |  |  |  |  |  | **•** |  | **•** | **•** | **•** |  |  |  |
| ПР06 |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  | **•** | **•** |  |  |  |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  |  |  |  |  |  |  |
| ПР07 |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  |  |  |  |  |  | **•** |  |  | **•** | **•** |  | **•** |  |  | **•** | **•** | **•** |  |  |  |  |  |  |  |  |
| ПР08 |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  | **•** | **•** |  |  |  | **•** |  |  |  |  |  |  |  |  |  | **•** | **•** |  |  |  |  |  | **•** |
| ПР09 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** |  | **•** |  |  |  |  | **•** |  | **•** | **•** |  |  |  |  | **•** |
| ПР10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  | **•** |  |  |  |  |  |  |  |
| ПР11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** |  |  | **•** | **•** | **•** | **•** |
| ПР12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  | **•** |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  |  |  |  |  |  |  |
| ПР13 |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** |
| ПР14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** |
| ПР15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  | **•** |  | **•** |  |  |  | **•** | **•** | **•** | **•** |  |  |  | **•** | **•** | **•** |
| СР01 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |
| СР02 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |
| СР03 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  | **•** |  |  |  |  |  |  |  |
| СР04 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |  |

Table 2. Matrix of correspondence of the competencies defined by the educational program to the components of the educational program

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Components of the educational program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| З1 | З2 | З3 | З4 | З5 | З6 | З7 | Б1 | Б2 | Б3 | Б4 | Ф1 | Ф2 | Ф3 | Ф4 | Ф5 | Ф6 | Ф7 | Ф8 | Ф9 | Ф10 | Ф11 | Ф12 | Ф13 | Ф14 | Ф15 | Ф16 | С1 | С2 | С3 | С4 | П1 | П2 | П3 | П4 | К1 |
| Learning competencies | К01 | **•** |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К02 |  |  |  | **•** | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К03 |  |  |  |  | **•** |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** |
| К04 |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  |  |  |  |  |  |  |  |  | **•** |  |  |  | **•** | **•** | **•** | **•** | **•** |
| К05 |  | **•** |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К06 |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К07 |  |  |  |  |  |  |  |  |  | **•** |  |  |  | **•** |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К08 |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К09 |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** |  |
| К10 |  |  |  | **•** |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К11 |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |
| К12 |  |  |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| К13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** |  |  | **•** |  |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  |  |  |  |  |  |
| К14 |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** |  | **•** |  |  | **•** | **•** |  |  | **•** | **•** | **•** | **•** | **•** |  | **•** | **•** | **•** | **•** | **•** |  |  |  |  | **•** |
| К15 |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** |  | **•** | **•** | **•** |  | **•** |  |  |  |  | **•** |  |  |  |  | **•** | **•** | **•** | **•** |
| К16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  | **•** | **•** |  |  |  |  |  |  |  | **•** |  |  |  |  | **•** |
| К17 |  |  |  |  |  |  |  |  | **•** |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  | **•** | **•** |  | **•** | **•** |  | **•** | **•** | **•** | **•** | **•** | **•** | **•** |  |  |  | **•** |
| К18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  | **•** | **•** | **•** |
| К19 |  |  |  |  |  |  |  |  |  | **•** |  |  | **•** | **•** | **•** | **•** | **•** | **•** |  | **•** |  |  | **•** |  |  |  |  |  |  |  |  |  |  |  |  | **•** |
| К20 |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** | **•** | **•** |  |  | **•** |  |  |  |  |  |  |  | **•** |  |  |  | **•** | **•** | **•** | **•** | **•** |
| К21 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** | **•** | **•** |  |  |  |  |  |  | **•** |  |  |  | **•** | **•** | **•** | **•** |  |  |  | **•** | **•** |
| К22 |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  | **•** | **•** | **•** | **•** | **•** |  | **•** |  |  | **•** |  |  | **•** | **•** | **•** | **•** |  |  |  |  |  |  |
| СК01 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  | **•** | **•** |
| СК02 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |  |
| СК03 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  | **•** |  |  |  |  |  |  |
| СК04 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **•** |  |  |  |  |  |  |  |

# 8 FINAL PROVISIONS

The program is developed taking into account normative and instructive materials of the international, branch and state levels:

1. Regulations on accreditation of educational programs for the training of higher education, approved by the Order of the Ministry of Education and Science of Ukraine dated July 11, 2019 № 977. Registered in the Ministry of Justice of Ukraine on August 08, 2019 for № 880/33851. [Electronic resource]. - Access mode, 22.01.2020: <https://zakon.rada.gov.ua/laws/show/z0880-19>
2. Criteria for evaluating the quality of the educational program. Annex to the Regulations on Accreditation of Educational Programs for the Training of Applicants for Higher Education (paragraph 6 of Section I). [Electronic resource]. - Access mode, 22.01.2020: <https://naqa.gov.ua/wp-content/uploads/2019/09/Критерії.pdf>.
3. Kvit Serhii. Roadmap for reforming higher education in Ukraine. Educational policy. Portal of public experts. [Electronic resource]. - Access mode, 22.01.2020: http://education-ua.org/ua/articles/1159-dorozhnya-karta-reformuvannya-vishchoji-osviti-ukrajini.
4. Glossary. National Agency for Quality Assurance in Higher Education. [Electronic resource]. Access mode, 22.01.2020: [https://naqa.gov.ua/wp-content/uploads/2020/01/%d0%93%d0%bb%d0%be%d1%81%d0%b0%d1%80%d1%96%d0%b9.pdf](https://naqa.gov.ua/wp-content/uploads/2020/01/Глосарій.pdf)
5. ECTS User Guide [Electronic resource]. URL: <http://mdu.in.ua/Ucheb/dovidnik_koristuvacha_ekts.pdf>.
6. Law of Ukraine "On Higher Education" [Electronic resource]. URL: <https://zakon.rada.gov.ua/laws/show/1556-18>.
7. Law of Ukraine "On Education" [Electronic resource]. URL: <https://zakon.rada.gov.ua/laws/show/2145-19>.
8. Letter of the Ministry of Education and Science of Ukraine dated 28.04.2017 № 1 / 9–239 on the use of sample educational programs in the work of higher education institutions.
9. Methodical recommendations on the development of higher education standards approved by the order of the Ministry of Education and Science of Ukraine dated 01.06.2016 № 600 (as amended in accordance with the orders of the Ministry of Education and Science of Ukraine dated 21.12.2017 №1648 and from 01.10.2019 № 1254).
10. Standard of higher education of Ukraine: first (bachelor's) level, field of knowledge 10 - Natural sciences, specialty 103 - Earth sciences. Approved and put into effect by the order of the Ministry of Education and Science of Ukraine dated 24.05.2019 №730. Kyiv: Ministry of Education and Science of Ukraine, 2019. 14 p.
11. Resolution of the Cabinet of Ministers of Ukraine of December 30, 2015 № 1187 "Licensing conditions for educational activities of educational institutions". <http://zakon5.rada.gov.ua/laws/show/1187-2015-п/page>.
12. Letter of the Ministry of Education and Science of Ukraine dated 05.06.2018 № 1 / 9–377 on providing explanations regarding educational programs.

The educational program is published on the university website before the start of admission of students.

The educational program extends to all departments of the university and comes into force from \_\_\_ \_\_\_\_\_\_\_\_\_\_\_ 2020.

The educational program is subject to revision in accordance with changes in the regulatory framework of Ukraine in the field of higher education, but at least once every two years. The duration of the educational program may not exceed 3 years 10 months and / or the accreditation period.

The guarantor of the educational program is responsible for the quality and unique competitive advantages of the educational program.

Educational edition

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