



**SATBAYEV
UNIVERSITY**

**Geology and Oil-gas Business Institute named after K. Turyssov
Department of "Hydrogeology, Engineering and Oil and Gas Geology"**

EDUCATIONAL PROGRAM

7M05203-Hydrogeology and Engineering Geology
code and name of the educational program

Code and classification of the field of education: 7M05 Natural Sciences

Mathematics and Statistics

Code and classification of training directions: 7M052 Environment

Group of educational programs: M088 Hydrogeology
and Engineering Geology

NRC level: 7

ORC Level: 7

Duration of training: 2 g

Amount of credits: 120

Almaty 2025

Educational program 7M05203 Hydrogeology and Engineering Geology
was approved at the meeting of K.I. Satbayev KazNRTU Academic Council

Minutes # 10 dated «06 » 03 2025.

was reviewed and recommended for approval at the meeting of K.I. Satbayev
KazNRTU Educational and Methodological Council

Minutes # 3 dated «20 » 12 2025 .

Educational program 7M05203 «Hydrogeology and Engineering Geology» was
developed by the Academic Committee in the field of "Environment"

Full name	Academic degree / academic title	Position	Place of work	Signature
Chairman of the Academic Committee:				
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Zapparov Medetkhan Rasilkhanovich	Candidate of Geological and Mineralogical Sciences, Mining engineer-geologist	engineer-geologist associate Professor	NCJS «Kazakh national research technical university named after K.I.Satbayev», mobile phone: +7 777 297 08 98, m.zapparov@satbayev. university	
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Students				

НАО «КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ
имени К.И. САТПАЕВА»

Bakbergenov Danila	-	1st year Master's student	of NAO "Kazakh National Research Technical University named after K. I. Satpayev", mobile phone: +77057730446 danila.bakbergenov@b k.ru	
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Table of contents

List of abbreviations and symbols

1. Description of the educational program
2. Purpose and objectives of the educational program
3. Requirements for evaluating the learning outcomes of the educational program
4. Passport of the educational program
- 4.1. General information
- 4.2. The relationship between the achievability of the generated learning outcomes in the educational program and academic disciplines
5. Curriculum of the educational program

List of abbreviations and symbols

DB – basic disciplines
SSO – the state mandatory standard of education
DP – documented procedure
DOT – distance learning technologies
UNT – Unified national testing
IEP – Individual curriculum
KTO-credit training technology
QED-catalog of elective subjects
Ministry of Education and Science of the Republic of Kazakhstan – Ministry
of Education and Science of the Republic of Kazakhstan
MOE-modular educational program
R & D – research work
R & D - research work activity
R & D – research work of a master's student
OOD – General education subjects
OP-educational program
PD-profile disciplines
PC – personal computer
Teaching staff – faculty members
Republic of Kazakhstan – Republic of Kazakhstan
RUP – working curriculum
QMS-Quality management system
CPM – independent work of a master's student
SRMP– independent work of undergraduates under the guidance of
the teacher
TUPI – standard curriculum
ATC – Training and support staff
UMKD – educational and methodical complex of disciplines
UMS-educational and methodical Council
UMR – educational and methodical work
EUM – electronic learning materials

1. Description of the educational program

The duration of the master's degree program is determined by the amount of academic credits completed. Upon completion of the set amount of academic credits and achievement of the expected learning outcomes for obtaining a master's degree, the Master's degree program is considered fully developed. In the scientific and pedagogical master's program, at least 120 academic credits are awarded for the entire period of study, including all types of educational and scientific activities of the master's student.

Planning of the content of training, the method of organizing and conducting the educational process is carried out by the university and the scientific organization independently on the basis of credit technology of training.

The Master's degree in scientific and pedagogical direction implements educational programs of postgraduate education for the training of scientific and scientific-pedagogical personnel for universities and scientific organizations with in-depth scientific and pedagogical and research training.

The content of the Master's degree program consists of:

- 1) theoretical training, including the study of cycles of basic and core disciplines;
- 2) practical training of undergraduates: various types of internships, scientific or professional internships;
- 3) research work, including the implementation of a master's thesis,
- 4) for the scientific and pedagogical master's program
- 5) final certification.

The content of the OP "Hydrogeology and Engineering Geology" based on the development of a multi-level system of personnel training, fundamental nature and quality of training, continuity and continuity of education and science, unity of training, education, research and innovation activities aimed at maximizing customer satisfaction should ensure:

- obtaining a full-fledged and high-quality professional and scientific-pedagogical education in the field of geology of solid mineral deposits (MPI), confirmed by the level of knowledge and skills, skills and competencies, their assessment, both in content and scope
- providing master's degree training for the geological industry, who know the technology, organization and economics of the hydrogeological industry, methods and principles of its improvement and design.
- training of professional and competitive specialists in the field of hydrogeology and engineering geology, prospecting and exploration of underground waters;
- high level of theoretical training in the field of socio-cultural, economic, legal and professional disciplines that take into account the trends of modern scientific, pedagogical and professional social development, including leading domestic and foreign specialists in the field of hydrogeology and engineering geology services in the educational process;
- high level of language training;

- development of skills in design and research activities, implementation of projects aimed at the practical application of modern professional digital methods and technologies for organizing the activities of geological production enterprises, research and educational organizations;
- optimal ratio of theoretical and practical training in the educational process (due to the purposeful organization of research and production practices);
- a person-centered approach to the educational process, focused on developing a responsible attitude to the results of their professional activities;
- aspect of self-development, where the emphasis is placed on the organization of professional activities, in which the master's student is focused on continuous professional self-improvement.

2. Purpose and objectives of educational program

The purpose of the OP: Training of competitive highly qualified personnel of a new generation in the field of hydrogeology and engineering geology, in demand on the labor market, designed to implement state programs aimed at digitalization of geological and hydrogeological information and industrial and innovative development of the Republic of Kazakhstan.

At the master's level, training in the specialty "Hydrogeology and Engineering Geology" is conducted along trajectories that involve the implementation of educational programs for training personnel in the hydrogeological and engineering - geological sectors who have in-depth technical and analytical, scientific and pedagogical and predictive skills.

Types of labor activity

- scientific and research organization;
- research and production;
- project information.
- organizational and managerial support.
- scientific and pedagogical work.

Depending on the type of professional activity, the Master's degree in Hydrogeology and Engineering Geology is prepared to solve the following professional tasks:

a. research activities:

- independent selection and justification of the goals and objectives of scientific research;

- independent selection and development of methods for solving assigned tasks when conducting field, laboratory, and interpretive research using modern equipment, instruments, and information technologies (in accordance with the direction (profile) of the master's degree program);

- analysis and generalization of research results using modern achievements of science and technology, advanced Kazakh and foreign experience;

- evaluation of research results, preparation of scientific reports, publications, reports, preparation of applications for inventions and discoveries;

b. research and production activities:

- independent preparation and conduct of industrial and scientific - industrial field, laboratory and interpretative research in solving practical problems (in accordance with the direction (profile) of the master's program);

- independent selection, training and professional operation of modern field and laboratory equipment and devices (in accordance with the direction (profile) of the master's degree program);

- collection, analysis and systematization of available specialized information using modern information technologies;

- complex processing and interpretation of field and laboratory information in order to solve scientific and industrial problems;

- determination of the economic efficiency of scientific and production works;

B. Project activities:

- design and implementation of scientific and technical projects;

- participation in the examination of research and production projects;

- participation in the development of normative methodological documents in the field of hydrogeological and engineering-geological works;

d. organizational and managerial activities:

- planning and organization of scientific research and production field, laboratory and interpretation works;

- planning and organization of scientific and industrial seminars and conferences;

D. scientific and pedagogical activities:

- participation in the preparation and conduct of seminars, practical classes and practices;

- participation in the management of scientific and educational work of students in the field of geology.

2 Objects of professional activity

- earth, earth's crust, lithosphere, rocks, aeration zone, ground water, artesian water, underground water deposits;

- physical properties of rocks, filtration abilities of rocks;

- underground water, drinking water, mineral water, and industrial water.

OP tasks:

- Ensure the readiness of specialists for research and project work in the field of prospecting, exploration, and exploitation of underground water deposits.

- Training of specialists for production and technological activities that ensure the introduction and operation of new methods of prospecting, exploration, and exploitation of underground water deposits.

- Readiness of specialists to search for and obtain new information necessary for solving professional problems in the field of knowledge integration in relation to their field of activity, to actively participate in the activities of an enterprise or organization.

- Readiness of specialists for scientific and informational, ideological and problematic communications in the professional environment and in the audience of

non-specialists with a clear and deep justification of their position, to engage in organizational, managerial and service activities, to be aware of responsibility for making their professional decisions.

–Readiness of specialists for self-study and continuous professional development during the entire period of scientific or professional activity.

3. Requirements for evaluating the learning outcomes of an educational program

By the end of the educational program "7M05203 Hydrogeology and Engineering Geology", undergraduates will be able to:

Perform hydrogeological and geotechnical field measurements, visualize the results based on comparison with complex data, understand the structure of the material and develop conclusions, scientific conclusions to identify the features of the results of work.

To argue the point of view and logic of building work in a team when drawing up maps, diagrams, sections and reporting documents in order to assess the accuracy of conclusions and results

Demonstrate fundamental and advanced knowledge in the field of hydrogeology and engineering geology for setting and solving research and production tasks

Critically analyze, present, defend, discuss and disseminate the results of their professional activities on the basis of modern methods of scientific communication in the state and foreign languages to solve the problems of professional activity.

Synthesize original ideas and research results in scientific publications of various levels to obtain new conclusions in the field of hydrogeology and engineering geology.

Be able to apply advanced knowledge in hydrogeology and engineering geology in their professional and academic careers, contributing to the formation of a highly educated individual with a broad outlook and culture

Use the acquired knowledge when conducting specific field or research work to solve problems of hydrogeology and engineering geology

Professionally solve problems of hydrogeology and engineering geology on the basis of independent collection, analysis and generalization of a priori geological information for system analysis, interpretation and explanation of the results obtained

Plan the types of hydrogeological works required for the organization of hydrogeological works

The following forms of examinations are used as an assessment of learning outcomes: written examination (answers on sheets), practical examination (open questions, problem solving), research work

The final certification ends with the defense of a master's thesis.

4. Passport of the educational program

4.1. General information

№	Field name	Note
1	Code and classification of the field of education	7M05 Natural Sciences Mathematics and Statistics
2	Code and classification of training	areas 7M052 Environment
3	Group of educational programs	M088-Hydrogeology and Engineering Geology
4	Name of the educational program	7M05203-Hydrogeology and engineering Geology
5	Brief description of the educational program	Hydrogeology and engineering Geology-scientific disciplines that study interaction underground waters and rocks, chemical and physical-mechanical properties of underground waters as complex solutions and rocks as multiphase systems, as well as processes developing in rock strata (massifs), on its properties, structure and dynamics, on the rational use of the geological environment and its protection, in connection with engineering and economic activities. first of all, human engineering and construction activities.
6	Purpose of the OP	Training of competitive highly qualified personnel of a new generation in the field of hydrogeology and engineering geology, in demand on the labor market, designed to implement state programs aimed at digitalization of geological and hydrogeological information and industrial and innovative development of the Republic of Kazakhstan.
7	Type of OP	New OP
8	Level according to NRC	7
9	Level according to ORC	7
11	List of competences of the educational program:	1. Natural-scientific and theoretical-ideological competencies; 2. Social-personal and civic competencies; 3. General engineering professional competencies; 4. Communication and IT virtual competencies
12	Learning outcomes of the educational program:	1. Conduct hydrogeological and engineering-geological field measurements, visualize the results based on comparison with complex data, understand the structure of the material and develop conclusions, scientific conclusions to identify the features of the results of work 2. To argue the point of view and logic of building work in a team when drawing up maps, diagrams, sections and reporting documents in order to assess the accuracy of conclusions and results 3. Demonstrate fundamental and advanced knowledge in the field of hydrogeology and engineering geology for the formulation and solution of research and production tasks 4. Critically analyze, present, defend, discuss and disseminate the results of their professional activities on the basis of modern methods of

		scientific communication in the state and foreign languages to solve the tasks of professional activity. 5. Synthesize original ideas, results of work in scientific publications of various levels to obtain new conclusions in the field of hydrogeology and engineering geology 6. Be able to apply advanced knowledge in hydrogeology and engineering geology in their professional and academic careers, contributing to the formation of a highly educated personality with a broad outlook and culture 7. To use the acquired knowledge in carrying out specific field or research work to solve problems of hydrogeology and engineering geology 8. Professionally solve the problems of hydrogeology and engineering geology on the basis of independent collection, analysis and generalization of a priori geological information for system analysis, interpretation and explanation of the results obtained 9. Plan the types of hydrogeological work necessary for organizing hydrogeological work
13	Form of study	full
-time 14	Duration	of study
2 years 15	Amount of credits	120
16	Languages of study	Russian, Kazakh, English
17	Academic degree awarded	Master of Natural Sciences
18	Developer(s) and authors:	Absametov M. K. Auyelkhan E. S.

4.2. The relationship between the achievability of the generated learning outcomes in the educational program and academic disciplines

#	Name of the discipline	Short description of the discipline	Number of credits	Generated learning outcomes (codes)								
				RO1	RO2	RO3	RO4	RO5	RO6	RO7		
Cycle of basic disciplines												
University component												
	Foreign language (professional)	The goal of the course is to master professional English at an advanced level (for non-linguistic areas). Study of grammatical characteristics of scientific style in its oral and written forms. Professional oral communication in monologue and dialogical form according to the educational program. Ability to demonstrate research results in the form of reports, abstracts, publications and public discussions; interpret and present the results of scientific research in a foreign language.	3						/			
	. History and philosophy of science	Purpose: To study the history and philosophy of science as a system of concepts of global and Kazakh science. Contents: Subject of philosophy of science, dynamics of science, main stages of historical development of science, features of classical science, non-classical and post-non-classical science, philosophy of mathematics, physics, engineering and technology, specifics of engineering sciences, ethics of science, social and moral responsibility of scientists and engineers.	3		/							
	v Higher school pedagogy	The course is aimed at mastering the methodological and theoretical foundations of higher education pedagogy. The discipline will help you master the skills of modern pedagogical technologies,	3		/							

		technologies of pedagogical design, organization and control in higher education, and skills of communication competence. At the end of the course, undergraduates will learn how to organize and conduct various forms of organizing training, apply active teaching methods, and select the content of training sessions. Organize the learning process based on credit-based learning technology.										
	v Management psychology	The course is aimed at mastering the tools of effective employee management, based on knowledge of the psychological mechanisms of the manager's activity. The discipline will help you master the skills of decision-making, creating a favorable psychological climate, motivating employees, setting goals, creating a team, and communicating with employees. At the end of the course, undergraduates will learn how to solve managerial conflicts, create their own image, analyze situations in the field of managerial activity, as well as conduct negotiations, be stress-resistant and effective leaders.	3			/						
Cycle of basic disciplines Elective component												
	Hydrogeological studies of ore deposits	The course aims to teach undergraduates the features of a comprehensive study (assessment) of hydrogeological, geological-structural, engineering-geological and mining-technological conditions of mineral deposits. Underground hydrogeological survey, observations of water inflows into mines. Methods of draining mineral deposits. Drainage systems and drainage installations in the development of mineral deposits. Methods of hydrogeological	5			/						

		calculation of water inflow to open and underground mine workings in various geological and hydrogeological conditions.											
	v Hydrogeological and geotechnical engineering, geoecological Research	The aim of the discipline is to analyze and evaluate the hydrogeological and engineering-geological and geoecological conditions of the territory, study the properties of soils and frozen rocks, study the hydrodynamic and hydrogeochemical regime of underground waters. One of the tasks is to predict the possibility of the place and time of occurrence of engineering and geological conditions and phenomena that affect the operation of mining enterprises that have an impact on the environment and on the geoecological conditions of the mining area.	5		/								
	. Remote methods of hydrogeological and engineering-geological research	The aim of the discipline is to clarify the boundaries of geomorphological elements at different scales, preliminary assessment of both hydrogeological and engineering-geological conditions of the territory as a whole, and its individual elements – relief, geological structure, tectonics, distribution of underground waters, geological, engineering-geological processes by an effective method. When probing, various types of aerial and space surveys are used: photographic, television, scanner, radar, multi-zone and others, carried out from artificial Earth satellites, as well as perspective images from	5			/							

		elevated terrain surfaces.										
	. Engineering and geological exploration	The purpose of engineering and geological exploration is to obtain initial quantitative data for calculating the foundations and foundations of structures or their environment for quantitative forecasting of changes in the geological environment during the construction and operation of structures. In this case, the forecast should be understood as a forecast of the occurrence and development of engineering and geological processes in the field of interaction of structures with the geological environment; a forecast of the development of identified physical and geological processes; a forecast of changes in the stress state of the soil mass.	5						/			
	. Intellectual Property and Research	The aim of this course is to provide undergraduates with the knowledge and skills necessary to understand, protect and manage intellectual property (IP) in the context of research and innovation. The course is aimed at training specialists who can effectively work with IP, protect the results of scientific research and apply them in practice.	5			/						
	. Deposits of mineral, industrial and thermal underground waters of Kazakhstan	During the course, the student will master the basic knowledge in the field of formation conditions, quality characteristics and the possibility of practical use of mineral therapeutic, industrial and thermal underground waters, master methods and techniques for obtaining hydrogeological	will be given 5									

		information to assess the conditions of formation of these deposits and assess their operational reserves. The main characteristics of the most significant deposits of mineral therapeutic, industrial and thermal underground waters of Kazakhstan will be presented, the main requirements for conducting prospecting and exploration work										
	Oil and gas hydrogeology	The course content is aimed at mastering theoretical knowledge on the hydrogeology of oil and gas-bearing basins, conditions of underground water occurrence, hydrogeochemical zoning of basins, main genetic types of waters and stages of their composition formation, hydrogeological criteria for oil and gas potential prospects, fundamentals of oil and gas exploration hydrogeology. Familiarization with the basics of paleohydrogeology and paleohydrogeological methods used in the search for oil and gas deposits, obtaining knowledge about the chemical composition of water-dissolved gases.	5						/			
	. Sustainable Development Strategies	Objective: To train undergraduates in sustainable development strategies to achieve a balance between economic growth, social responsibility and environmental protection. Content: Undergraduates will study concepts and principles of sustainable development, development and implementation of sustainable	5									

		development strategies, assessment of their effectiveness, as well as international standards and best practices. Cases and examples of successful sustainable development strategies are included.										
	Geophysical aspects in hydrogeology and Engineering Geology	The aim of the discipline is рассматривать to examine the physical properties of rocks and the nature of the associated physical fields. The principles of operation and design of geophysical equipment, techniques for performing field measurements and processing the obtained data are described, and the scope of application is indicated.	4									
Cycle of profile disciplines University component												
	Hydrogeological research on hydrocarbon	deposits The purpose of the discipline is to study the hydrogeological conditions of territories and use hydrogeological indicators and criteria to assess the prospects for their oil and gas potential and to search for oil and gas fields and deposits. Studies methods and methods of research of various underground water deposits, as well as technical means for carrying out these studies. The conditions for the presence and types of water in rocks, the basics of hydrogeochemistry, and the formation and movement of aqueous solutions in the lithosphere are considered.	5		/							
	. Hydrogeological research in the underground leaching of minerals	The purpose of teaching the discipline is to study the hydrogeological conditions for the development of	5						/			

		mineral deposits to improve the technologies of extraction and complex extraction of mineral raw materials. In this regard, for the accelerated and efficient development of the mining industry, further development of physical and chemical methods of mining is required. It is necessary to study in detail the hydrogeological features of ore leaching, substantiate the issues of subsurface and environmental protection, and give specific recommendations on hydrogeodynamics and hydrogeochemistry ore leaching										
	v Study of the regime and balance state for the rational use of underground water	The purpose of the discipline is to study the issues of drawing up the water balance of various hydrodynamic areas and zones, calculating the income and expenditure items of balance sites, the reasons that determine their value. Study and forecast of changes in groundwater levels and their mineralization in irrigated areas. Hydrogeological, hydrodynamic, and hydrochemical factors of underground water formation, meaning of the water cycle.	5		/							
	. Engineering and geological surveys for various types of structures	The purpose of the discipline is for students to learn special methods of engineering and geological surveys in the planning, design, construction and operation of various types of structures. The discipline is aimed at acquiring knowledge on special	5					/				

		technologies and the sequence of engineering and geological surveys in the framework of geomonitoring at different stages. The purpose of the course, its structure, and its relationship to other disciplines. Brief historical information. Tasks of engineering and geological research. Main types of engineering and geological research.										
	. Use and protection of underground waters	The aim of the discipline is to form students ' modern ideas about the importance of water resources, their use, protection and methods of managing water management activities in river basins. The main objectives of the course are: - to deepen knowledge about the basic properties of water and its role in nature, the vital activity of organisms and the national economy; - to form ideas about the functioning of the river basin as a complex integral system; - familiarization with modern approaches to usage management.	5				/					
	. Computer modeling in hydrogeology and engineering geology	The aim of the discipline is to train students in modern methods of creating, editing, storing and organizing spatial data; modern methods of processing and analyzing various types of spatial information, a number of software complexes used for processing hydrogeodynamic and hydrogeochemical information and modeling (Excel, Statistica, Surfer, Ansdimat, Modflow). Process hydrogeological information, schematize the hydrogeological	5				/					

		conditions of territories, and create geofiltration and geomigration zones. models that use information from various sources.										
	. Regional hydrogeology and engineering geology	The aim is a section of hydrogeology and engineering geology that reflects the engineering and geological conditions of various structural zones of the Earth's crust, patterns of their spatial distribution and formation, and spatial and temporal changes under the influence of modern and predicted natural and anthropogenic geological processes, and studies the patterns of distribution and formation of groundwater within large areas of the territory	5				/					
	. Technology of drilling hydrogeological and engineering geological wells	The purpose of the discipline is to study issues related to the construction of wells for various purposes: for the exploration of gold, diamonds, coal, iron and other solid minerals, as well as hydrogeology; get skills that allow you to further develop technologies and manage the technique of sinking mining workings applied for various purposes, from hydrogeology to mineral exploration.	5				/					
	. Operational exploration of underground water	deposits The purpose of studying the discipline is hydrogeological and ecological justification for the construction of a new or expansion of an existing water intake with the identification of operational reserves of underground water in the amount and quality that ensure the operation of the water intake during a given period	5				/					

		of operation, bringing the study of operational reserves. Preliminary exploration is carried out in order to study the main features of the geological and hydrogeological conditions of the field, assess the main sources of formation and the total value of operational groundwater reserves										
Cycle of profile disciplines												

5. Curriculum of the educational program

NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"



«APPROVED»
Decision of the Academic Council
NPJSC «KazNRTU»
named after K.Satbayev»
dated 06.03.2025 Minutes № 10

WORKING CURRICULUM

Academic year

2025-2026 (Autumn, Spring)

Group of educational programs

M088 - "Hydrogeology and geology engineering"

Educational program

7M05203 - "Hydrogeology and engineering geology"

The awarded academic degree

Master of science in Natural Sciences

Form and duration of study

full time (scientific and pedagogical track) - 2 years

Discipline code	Name of disciplines	Block	Cycle	Total ECTS credits	Total hours	lab/lab/pr Contact hours	in hours SIS (including TSES)	Form of control	Allocation of face-to-face training based on courses and semesters				Prerequisites
									1 course		2 course		
									1 sem	2 sem	3 sem	4 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)													
CYCLE OF BASIC DISCIPLINES (BD)													
M-1. Module of basic training (university component)													
LNG213	Foreign language (professional)		BD, UC	3	90	0/0/30	60	E	3				
HUM214	Psychology of management		BD, UC	3	90	15/0/15	60	E	3				
GIG223	Deposits of mineral, industrial and thermal underground waters of Kazakhstan	1	BD, CCH	5	150	30/0/15	105	E	5				
GEO762	Remote sensing methods for hydrogeological and engineering-geological studies	1	BD, CCH	5	150	30/0/15	105	E	5				
MNG781	Intellectual property and research	1	BD, CCH	5	150	30/0/15	105	E	5				
GEO249	Hydrogeological exploration of mineral deposits	2	BD, CCH	5	150	30/0/15	105	E	5				
MNG782	Sustainable development strategies	2	BD, CCH	5	150	30/0/15	105	E	5				
GEO299	Oil and gas hydrogeology	2	BD, CCH	5	150	30/0/15	105	E	5				
HUM212	History and philosophy of science		BD, UC	3	90	15/0/15	60	E		3			
HUM213	Higher school pedagogy		BD, UC	3	90	15/0/15	60	E		3			
GEO253	Engineering geological exploration	1	BD, CCH	5	150	30/0/15	105	E			5		
GEO761	Hydrogeological and engineering-geological, geotectological research	1	BD, CCH	5	150	30/0/15	105	E			5		
M-3. Practice-oriented module													
AAP273	Pedagogical practice		BD, UC	8				R			8		
CYCLE OF PROFILE DISCIPLINES (PD)													
M-2. Module of hydrogeology													
GEO711	Groundwater use and protection		PD, UC	5	150	30/0/15	105	E	5				
GEO737	Operational exploration of groundwater deposits		PD, UC	5	150	30/0/15	105	E	5				
GEO715	Regional hydrogeology and engineering geology of Kazakhstan		PD, UC	5	150	30/0/15	105	E		5			
GEO739	Technology of drilling hydrogeological and geotechnical wells		PD, UC	5	150	30/0/15	105	E		5			
GEO254	Computer modeling in hydrogeology and engineering geology		PD, UC	5	150	30/0/15	105	E		5			
GEO720	Engineering and geological types for various types of constructions		PD, UC	5	150	30/0/15	105	E		5			
GIG224	Hydrogeological studies in underground leaching of minerals		PD, UC	5	150	30/0/15	105	E			5		

GEO741	Studying of the mode and balance state for the rational use of underground waters		PD, UC	5	150	300/15	105	E			5		
GEO250	Hydrogeological research on hydrocarbon deposits		PD, UC	5	150	300/15	105	E			5		
GIG246	Geophysical aspects in hydrogeology and engineering geology		PD, UC	4	120	300/15	75	E				4	
M-3. Practice-oriented module													
AAP256	Research practice		PD, UC	4				R				4	
M-4. Experimental research module													
AAP268	Research work of a master's student, including internship and completion of a master's thesis		RWMS	4				R	4				
AAP268	Research work of a master's student, including internship and completion of a master's thesis		RWMS	4				R		4			
AAP251	Research work of a master's student, including internship and completion of a master's thesis		RWMS	2				R			2		
AAP255	Research work of a master's student, including internship and completion of a master's thesis		RWMS	14				R				14	
M-5. Module of final attestation													
ECA212	Registration and protection of the master thesis		FA	8							8		
Total based on UNIVERSITY:									30	30	30	30	
									60		60		

Number of credits for the entire period of study					
Cycle code	Cycles of disciplines	Credits			
		Required component (RC)	University component (UC)	Component of choice (CCH)	Total
GED	Cycle of general education disciplines	0	0	0	0
BD	Cycle of basic disciplines	0	20	15	35
PD	Cycle of profile disciplines	0	53	0	53
Total for theoretical training:		0	73	15	88
RWMS	Research Work of Master's Student				24
ERWMS	Experimental Research Work of Master's Student				0
FA	Final attestation				8
TOTAL:					120

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes №3 dated 20.12.2024

Decision of the Academic Council of the Institute. Minutes №3 dated 28.11.2024

Signed:
Governing Board member - Vice-Rector for Academic Affairs
Approved:
Vice Provost on academic development
Head of Department - Department of Educational Program Management and Academic-Methodological Work
Director - Geology and Oil-gas Business Institute named after K. Turyayev
Acting Department Chair - Hydrogeology, Engineering and Oil and Gas Geology
Representative of the Academic Committee from Employers
____Acknowledged____

Ukenbayeva R. K.
Kalpeyeva Z. B.
Zharagaliyeva A. S.
Auyeldan Y. .
Akpanbayev R. C.
Abusamatov M. K.



Note:

1. Module of basic training and professional activity departments themselves prescribe the names of modules and their number
2. * - Division into types of work at the discretion of the department
3. If necessary, the disciplines: Physics II, Mathematics III, General Chemistry of the department include at the expense of credits of the department component DB, VC from the basic training module
4. The full academic load of one academic year should be 60 academic credits
5. The application of the catalog of elective subjects is the same as the Curriculum is divided into modules, with the inclusion of the Module "R&D"