NJSC "Kazakh National Research Technical University named after K.I. Satpaev"
Institute of Geology and Oil and Gas K.Turysova
Department of "Geological Survey, Prospecting and Exploration of Mineral Deposits"

EDUCATIONAL PROGRAM

"APPLIED GEOLOGY"
Bachelor of Science in Educational Program
"6B05203 Applied Geology"

Almaty 2022

The program is drawn up and signed by the parties:

From KazNITU named after K. Satpaev:
1. Head of the Department of the SSPiRMPI Bekbotayeva A.A.
2. Director of IGNGD them. K.Turysova Syzdykov A.Kh.
3. Member of the Academic Committee Zhunusov A.A.

From employers:
1. Chief researcher of the Institute of Geological Sciences named after K.I. Satpaev, Candidate of Geological and Mineralogical Sciences Zhunusov A.A.
2. Director of ICC GEO LLP, full member of PONEN - Kabaziyev B.M.

From the partner university:
1. Head of the Center for the Collective Use of Scientific Equipment "Center for the Study of Mineral Raw Materials and the State of the Environment" of the Southern Federal University, Associate Professor of the Department of Mineral Deposits of the Institute of Earth Sciences of the Southern Federal University. Popov Yu.V. (Russia, Rostov-on-Don)
2. Professor, Doctor of Science, Head of the Department of Mineralogy and Petrology Andrzej Muszynski Adam Mickiewicz University (Poland, Poznan)

Approved at a meeting of the Academic Council of the Kazakh National Research Technical University named after K.I. Satpaev. Minutes No.14 dated 17.05.2022.

Qualification:
Level 6 of the National Qualifications Framework:
B052 Earth science
6B05203 "Applied geology" (bachelor):

Professional competence: The educational program is aimed at providing comprehensive and high-quality training of specialists to meet the requirements of the 6th level of the Professional Standard of the Industry Qualification Framework "Geological survey, prospecting and exploration of mineral deposits" in the field of geological study of subsoil, geological survey, remote sensing, information technologies in geology and computer modeling .

BRIEF DESCRIPTION OF THE PROGRAM

It is intended for the implementation of profile training of bachelors in the educational program of the specialty "Applied Geology" at KazNRTU named after K.I. Satpaev and developed within the framework of the "Science of the Earth" direction.

This document meets the requirements of the following legislative acts of the Republic of Kazakhstan and regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan:

- The Law of the Republic of Kazakhstan "On Education" with amendments and additions within the framework of legislative changes to increase the independence and autonomy of universities dated 04.07.18 No. 171-VI.
- Law of the Republic of Kazakhstan "On amendments and additions to certain legislative acts of the Republic of Kazakhstan on the issues of expanding the academic and managerial independence of higher educational institutions" dated 04.07.18 No. 171-VI.
- Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 “On Approval of the Model Rules for the Activities of Educational Organizations of the Relevant Types”.
- State obligatory standard of higher education (Appendix 7 to the order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 604.
- Decree of the Government of the Republic of Kazakhstan dated 19.01.12 No. 111 “On approval of the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher Education” with amendments and additions dated 14.07.16 No. 405.
- Decree of the Government of the Republic of Kazakhstan dated August 13, 2012 No. 1042 “On approval of the Concept for the development of geologicalindustry until 2030”.
- The Law on Subsoil and Subsoil Use and the draft Code on Subsoil and Subsoil Use.
- Code of Public Reporting on Exploration Results, Mineral Resources and Reserves of KAZRC.
- The concept of the State program of geological exploration for 2021-2025, January 31, 2020
- "National Qualifications Framework", approved by the protocol of March 16, 2016 by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
- Sectoral qualifications framework "Geology of solid minerals, common minerals and groundwater" of the National Qualification System of the Republic of Kazakhstan. Appendices No. 67, 68, 70, 71, 74, 75, 76, 81, 82 to the order of the

Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated December 26, 2019 No. 263.

- *The purpose of the educational program "Applied Geology"*is the training of highly qualified, competitive and in-demand specialists in the labor market for geological, geological survey, mining enterprises of the Republic of Kazakhstan, capable of performing design, production, technological, organizational work at industrial enterprises of the region. Applied geology: areas of exploration and geological survey equipment and technology, Aimed at providing comprehensive and high-quality training of specialists to meet the requirements of the 6th level of the Professional Standard of the Industry Qualification Framework "Geological Survey, Prospecting and Exploration of Mineral Deposits" (including using GIS).

Types of labor activity:

– production and technological;
– organizational and managerial;
– experimental research:
– calculation and design and analytical

A bachelor in Applied Geology, depending on the type of professional activity, is prepared to solve the following professional tasks:

a) production and technological activities:

– design of technological processes for the study of natural accumulations of minerals at the stages of regional geological study, prospecting, exploration of mineral deposits;

– solving production problems in the course of field geological, geochemical, environmental and geological work, cameral, laboratory and analytical studies;

– operation of modern field and laboratory equipment and instruments;

– registration of primary geological, geological-geochemical and geological-environmental documentation of field observations, sampling of the soil-vegetative layer, rocks and minerals on the surface, in open, underground mine workings and wells, in surface and underground waters and subsoil air;

– keeping records of work performed and assessing their economic efficiency;

– processing, analysis and systematization of field and field geological, geochemical, ecological and geological information using modern methods of its automated collection, storage and processing;

– development of methodological documents in the field of geological survey, prospecting, exploration, exploitation work, geological and economic assessment of subsoil use objects;

– implementation of measures for the safe conduct of geological exploration and protection of personnel and the environment at all stages of production;

b) organizational and managerial:

- organization of prospecting, geological surveying, exploration works;
- development of operational plans for the work of production units;
- preparation of initial data for the selection and justification of technical and organizational solutions based on economic calculations.

c) experimental research:

- collection and systematization of scientific and technical information of domestic and world experience in relation to the solution of geological problems, including the use of modern geographic information systems;
- mathematical modeling of geological processes and geological objects based on standard packages of computer-aided design and research;
- planning, conducting experiments according to specified methods, mathematical processing and analysis of the results.

d) calculation and design and analytical:

- formation of goals and objectives of the project (program), providing a modern level of technology for geological survey and exploration work;
- collection and analysis of informational initial data for designing in information systems;
- conducting a preliminary feasibility study of design calculations using automated systems;
- implementation of projects in production and architectural supervision.
- implementation of technical design in the field of geological, geochemical and environmental mapping of territories, forecasting, prospecting, exploration, geological, economic and environmental assessment of mineral deposits, as well as objects associated with underground structures;
- drawing up geological, methodological and production and technical sections of projects for the activities of production units as part of production teams and independently;
- development of technology for carrying out geological survey, prospecting and exploration work at mineral deposits and drawing up a geological task for their implementation.

- *Objects of professional activity of the graduate:*

– mineral natural resources (solid metallic, non-metallic, liquid and gaseous), methods of their prospecting and exploration,

– technologies for studying crystals, minerals, rocks, deposits of solid, liquid and gaseous minerals, geological formations, the earth's crust, the lithosphere and planet Earth as a whole;

– equipment and technologies of geological, mineralogical, geochemical, hydrogeological, engineering-geological mapping and mapping,

– forecasting technologies, geological and economic assessment of mineral deposits,

– equipment and technologies for the production of works during prospecting, exploration,
– geoinformation systems - subsoil research technologies,
– ecological functions of the lithosphere and the ecological state of mining areas of subsoil use.

1 SCOPE AND CONTENT OF THE PROGRAM

The volume of the bachelor's degree program is 242 credits, regardless of the form of study, educational technologies used, the implementation of the bachelor's program using the network form, the implementation of the bachelor's program according to an individual curriculum, including accelerated learning.

The educational program "Applied Geology" is based on - National Qualifications Framework; Industry qualification framework in the field of Geology and Professional standards "Geological survey, prospecting and exploration of mineral deposits" using Geographic Information Systems.

The content of the EP "Applied Geology" based on the development of a multi-level system of training, the fundamentality and quality of education, the continuity and succession of education and science, the unity of education, upbringing, research and innovation, aimed at maximum satisfaction of consumer needs, should ensure:

- obtaining a full-fledged and high-quality professional education in the field of geology of mineral deposits (MPI), confirmed by the level of knowledge and skills, skills and competencies, their assessment, both in content and in volume

-providing the training of bachelors for the geological industry, who know the technology, organization and economics of the geological industry, methods and principles of its improvement and design.

- training of professional and competitive specialists in the field of geology, prospecting and exploration of mineral resources;

- ability to apply knowledge of mathematics, fundamental and technical sciences;

-use of methods for analyzing and evaluating the results of experiments;

-knowledge of modern problems of geology;

- to promote the acquisition of practical skills in the search, exploration and development of minerals, mathematical processing of the results of scientific research, compiling technological passports of technological processes using modern information technologies;

- the ability to use the methods, skills and modern technical means necessary in engineering practice;

- the ability to find and work with the necessary literature, computer information, databases and other sources of information to solve the tasks;

- to form in students the skills of working in a team, production and ethical responsibility, the ability to understand the problem and, from working together with various specialists, find solutions, the need to improve their knowledge and skills;

- the ability to work in a team on interdisciplinary topics, while showing individuality, and, if necessary, solving problems independently;

- the readiness of students for professional activities through disciplines that provide fundamental knowledge, skills and abilities to work in production, government organizations and educational institutions;

- be able to analyze and monitor, as well as make management decisions based on their results;

- possess erudition, knowledge of contemporary social and political problems, be proficient in state Russian and foreign languages, market economy tools, security and environmental issues.

Objectives of the educational program:

- study of a cycle of general education disciplines to provide social and humanitarian education based on the laws of the socio-economic development of society, history, modern information technologies, the state language, foreign and Russian languages;

- the study of a cycle of basic disciplines to provide knowledge of natural sciences, general technical and economic disciplines, as the foundation of vocational education;

- the cycle of major disciplines is focused on the study of key theoretical aspects of geology, prospecting and exploration of solid, liquid and gaseous minerals, rational use of natural resources;

- the study of disciplines that form knowledge, skills and abilities of planning and organizing research, designing geological work;

- familiarization with the technologies and equipment of enterprises during the period of various types of practices.

- acquisition of skills and abilities of laboratory research, technological calculations, equipment selection and design using modern computer technologies and programs.

3 APPLICATION REQUIREMENTS

Admission of persons entering KazNITU is carried out by placing a state educational order (educational grants), as well as paying for education at the expense of citizens' own funds and other sources.

Admission is carried out at the request of an applicant who has completed in full secondary, secondary special education on a competitive basis in accordance with the points of the certificate issued on the basis of the results of the unified national testing (hereinafter referred to as the UNT) or comprehensive testing. To participate in the competition, you must score at least 65 points when entering a national university.

Admission to the university of persons with technical and vocational or post-secondary education with the qualification of "mid-level specialist" or "applied bachelor" in related areas of training of higher education personnel, providing for reduced training periods, is carried out according to the results of the UNT. (Model rules for admission to study in educational organizations implementing educational programs of higher and postgraduate education dated October 31, 2018 No. 600).

Credit transfer rules for accelerated (reduced) education based on secondary technical and higher education

The code	Type of competence	Description of competence	Competence result	Responsible
GENERAL (Implies full training with possible additional depending on the level of knowledge)				
G1	Communication	- Fluent monolingual oral, written and communication skills - Ability to communicate fluently with a second language - Ability to use communicative communication in various situations - have the basics of academic writing in their native language - diagnostic test for language level	Full 4-year study with a minimum of 242 academic credits	Department of Kazakh and Russian Language, Department of English
G2	Mathematical Literacy	- Basic mathematical thinking at the communication level - the ability to solve situational problems based on the mathematical apparatus of algebra and the beginnings of mathematical analysis	Full 4-year study with a minimum of 242 academic credits	Department of Math
G3	Basic science literacy	- basic understanding of the scientific picture of the world with an understanding of the essence of the basic laws of science	Full 4-year study with a minimum of 242 academic credits	Departments in the areas of natural sciences

		- understanding of basic hypotheses, laws, methods, formulation of conclusions and estimation of errors		
SPECIFIC (implies reduced training due to credit transfer depending on the level of knowledge in competencies for graduates of colleges, universities, including humanitarian and economic areas)				
S1	Communication	- Fluent bilingual oral, written and communication skills - Ability to communicate fluently with a third language - Skills in writing text of various styles and genres - skills of deep understanding and interpretation of own work of a certain level of complexity (essay) - basic aesthetic and theoretical literacy as a condition for full perception, interpretation of the original text	Full credit transfer by language (Kazakh and Russian)	Department of Kazakh and Russian language
S2	Mathematical Literacy	- Special mathematical thinking using induction and deduction, generalization and concretization, analysis and synthesis, classification and systematization, abstraction and analogy - the ability to formulate, substantiate and prove the provisions - application of general mathematical concepts, formulas and extended spatial perception for mathematical problems - a complete understanding of the basics of mathematical analysis	Transfer of credits in the discipline Mathematics I	Department of Math
S3	Special literacy in the natural sciences (Physics, Chemistry)	- A broad scientific perception of the world, involving a deep understanding of natural phenomena - critical perception to understand the scientific phenomena of the surrounding world - cognitive abilities to formulate a scientific understanding of the forms of existence of matter, its interaction and manifestations in nature	Transfer of credits in Physics I, General Chemistry	Departments in the areas of natural sciences

S4	English language	- readiness for further self-study in English in various fields of knowledge - willingness to gain experience in project and research work using English	Transfer of English language credits above academic to professional level (up to 15 credits)	Department of English
S5	Computer skills	- Basic programming skills in one modern language - use of software and applications for training in various disciplines -the presence of a global standard certificate of language level	Transfer of credits in the discipline Introduction to information and communication technologies, Information and communication technologies	Department of Software Engineering
S6	Socio-humanitarian competencies and behavior	- understanding and awareness of the responsibility of each citizen for the development of the country and the world - Ability to discuss ethical and moral aspects in society, culture and science	Transfer of credits in the Modern History of Kazakhstan (except for the state exam)	Department of Public Disciplines
		- Critical understanding and debating ability to debate current scientific hypotheses and theories	Transfer of credits in philosophy and other humanitarian disciplines	
PROFESSIONAL (implies reduced training due to credit transfer depending on the level of knowledge in competencies for graduates of colleges, universities, including humanitarian and economic areas)				
P1	Professional competencies	- critical perception and deep understanding of professional competencies at level 5 or 6 - The ability to discuss and argue on professional issues within the framework of the mastered program	Transfer of credits in basic professional disciplines, including general and historical geology, crystallography and mineralogy, petrography, structural geology, educational and industrial practice	Graduating Department
P2	General engineering competencies	- basic general engineering skills and knowledge, the ability to solve general engineering tasks and problems - be able to use application packages for processing experimental data, solving systems of algebraic and differential equations	Transfer of credits in general engineering disciplines (Engineering graphics, descriptive geometry, well drilling, etc.)	Graduating Department

P3	Engineering and computer competencies	- basic skills in using computer programs and software systems to solve general engineering problems	Transfer of credits in the following disciplines of computer graphics, CAD basics, CAE basics, etc.	Graduating Department
P4	Engineering and work competencies	- skills and abilities to use technical means and experimental devices to solve general engineering problems	Transfer of credits in academic disciplines of the experimental direction: mineralogy, etc.	Graduating Department
P5	Socio-economic competencies	- Critical understanding and cognitive ability to reason on contemporary social and economic issues - Basic understanding of the economic evaluation of objects of study and the profitability of industry projects	Recalculation of loans in socio-humanitarian and technical-economic disciplines against the elective cycle	Graduating Department

4 COMPLETION AND DIPLOMA REQUIREMENTS

•The graduate of this educational program is awarded the academic degree "Bachelor of Natural Science".

•Certified bachelors should have deep knowledge and skills in the field of geology, prospecting and exploration of deposits of solid, liquid and gaseous minerals. They must have practical experience based on the study of basic and specialized disciplines, and the study of methodology during the passage of all types of practices. They should have the knowledge and skills to analyze the methodology and identify existing problems. Graduates should be able to develop work programs for various types of geological work.

•Bachelors must have the communication skills to be able to present their ideas and information, both orally and in writing. The specialist should be able to present graphic information in the form of figures, tables, slides and drawings. He must be competent in the search and interpretation of technical information using various search engines (patent search, literature review of magazines and books, the Internet).

•Bachelors must be socially mobile, able to adapt to new situations in a professional environment.

•Bachelors should be able to organize cooperation in a team, show creativity and breadth of interests to solve interdisciplinary problems. The specialist must be tolerant, capable of criticism and self-criticism and be prepared to take on the role of a team leader and have the skills of interaction and cooperation. The graduate must have ethical education and the need for his development through self-improvement and lifelong learning.

•Bachelors must have a good knowledge of Kazakh, Russian and foreign languages, be able to work in the international community, maintain the rules of ethics in society, at work and in interpersonal communication. They must demonstrate the ability to achieve goals, solve problems in non-standard situations. Specialists must take care of environmental protection and, by improving their skills, serve to the development of the welfare of the whole society.

•Bachelors must have: good communication skills, appreciate the traditions of other cultures, their diversity in modern society, fundamental basic education, economic, social and legal training.

5 WORKING CURRICULUM OF THE EDUCATIONAL PROGRAM

САТБАЕВ УНИВЕРСИТЕТІ SATBAYEV UNIVERSITY

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K.I.SATBAYEV

SATBAYEV UNIVERSITY

APPROVED
Chairman of the Management Board-
Rector of KazNRTU named after K.Satbayev
M.M. Begentaev
05 2022 y.

CURRICULUM

of Educational Program on enrollment for 2022-2023 academic year

Educational program 6B05203 - "Applied Geology"
Group of Educational programs B052 - "Earth Science"

Form of study: full-time **Duration of study: 4 years** **Academic degree: bachelor of natural sciences**

Discipline code	Name of disciplines	Cycle	Total amount in credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in hours	Form of control	Allocation of face-to-face training based on courses and semesters							
								I course		II course		III course		IV course	
								1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 semester	8 semester
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)															
M-1. Module of language training															
LNG 108	English language	GED, RC	10	300	0/0/6	210	E	5	5						
LNG 104	Kazakh (Russian) language	GED, RC	10	300	0/0/6	210	E	5	5						
M-2. Module of physical training															
KFK 101-104	Physical Culture	GED, RC	8	240	0/0/8	120	Difcredit	2	2	2	2				
M-3. Module of information technology															
CSE 677	Information and communication technologies (in English)	GED, RC	5	150	2/1/0	105	E			5					
M-4. Module of socio-cultural development															
HUM 100	Modern History of Kazakhstan	GED, RC	5	150	1/0/2	105	SE	5							
HUM 132	Philosophy	GED, RC	5	150	1/0/2	105	E			5					
HUM 120	Socio-political knowledge module (sociology, politology)	GED, RC	3	90	1/0/1	60	E			3					
HUM 134	Socio-political knowledge module (culturology, psychology)		5	150	2/0/1	105	E				5				
M-5. Module of anti-corruption culture, ecology and life safety base															
HUM 133	Fundamentals of anti-corruption culture	GED, CCH	5	150	2/0/1	105	E				5				
MNG 488	Fundamentals of Entrepreneurship and Leadership														
CHE 656	Ecology and life safety														
CYCLE OF BASIC DISCIPLINES (BD)															
M-6. Module of physical and mathematical training															
MAT 101	Mathematics I	BD, UC	5	150	1/0/2	105	E	5							
PHY 468	Physics	BD, UC	5	150	1/1/1	105	E	5							
MAT 102	Mathematics II	BD, UC	5	150	1/0/2	105	E		5						
M-7. Basic geological training module															
GEN429	Engineering and computer graphics	BD, UC	5	150	1/0/2	105	E		5						
GEO489	Physical geology	BD, UC	4	120	2/1/0	75	E	4							
GEO432	Structural geology	BD, UC	5	150	2/1/0	105	E		5						
GEO196	Crystallography and mineralogy	BD, UC	6	180	2/2/0	120	E			6					
GEO509	Petrography with the basics of petrology	BD, UC	5	150	1/2/0	105	E				5				
MAP160	Geodesy	BD, UC	5	150	2/1/0	105	E			5					
CHE495	Chemistry	BD, UC	5	150	1/1/1	105	E			5					
GEO104	Geology of Kazakhstan	BD, UC	5	150	2/1/0	105	E				5				
GEO610	Lithology	BD, UC	5	150	2/1/0	105	E					5			
GEO592	Geoinformation systems in geology	BD, UC	5	150	2/1/0	105	E				5				
GEO591	Applied Geophysics	BD, UC	5	150	2/1/0	105	E					5			
PET406	Drilling of the wells	BD, UC	5	150	2/1/0	105	E					5			
3218	Electives	BD, CCH	5	150	2/1/0	105	E					5			

3219	Electives	BD, CCH	5	150	2/1/0	105	E					5			
GEO594	Fundamentals of the doctrine of minerals	BD, UC	5	150	2/1/0	105	E					5			
GEO595	Methods of prospecting and exploration of mineral deposits	BD, UC	5	150	2/1/0	105	E						5		
GEO596	Historical geology	BD, UC	4	120	2/1/0	75	E						4		
3220	Electives	BD, UC	5	150	2/0/1	105	E						5		
4221	Electives	BD, CCH	6	180	2/1/1	120	E							6	
AAP164	Educational geological survey practice	BD, UC	2						2						
CYCLE OF PROFILE DISCIPLINES (PD)															
M-8. Module of professional geological training															
GEO612	Geology of hydrocarbon compounds	PD, UC	4	120	2/0/1	75	E						4		
GEO443	Fundamentals of subsoil	PD, UC	5	150	2/0/1	105	E						5		
GEO599	Hydrogeology and fundamentals of engineering geology	PD, UC	4	120	2/1/0	75	E						4		
4305	Electives	PD, CCH	6	180	2/2/0	120	E							6	
4306	Electives	PD, CCH	5	150	2/0/1	105	E							5	
4307	Electives	PD, CCH	5	150	2/0/1	105	E							5	
4308	Electives	PD, CCH	6	180	2/0/1	120	E							6	
4309	Electives	PD, CCH	5	150	2/0/1	105	E							5	
4310	Electives	PD, CCH	5	150	2/0/1	105	E								5
4311	Electives	PD, CCH	5	150	2/0/1	105	E								5
4312	Electives	PD, CCH	5	150	2/0/1	105	E								5
AAP143	Industrial internship I	PD, UC	2								2				
CIV786	Industrial internship II	PD, UC	3										3		
M-9. Module of final attestation															
ECA003	Preparation and writing of a thesis (project)	FA	6												6
ECA103	Defense of the thesis (project)	FA	6												6
M-10. Module of additional types of training															
AAP500	Military affairs	ATT	0												
	Total based on UNIVERSITY:							31	29	31	29	30	30	33	27
								60		60		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	51		5	56
BD	Cycle of basic disciplines		91	21	112
PD	Cycle of profile disciplines		18	42	60
	Total for theoretical training:	***51***	***109***	***68***	***228***
FA	final attestation	12			12
	TOTAL:	**63**	**109**	**68**	**240**

Decision of the Academic Council of KazNRTU named after K.Satbayev. Protocol № 14 от "17" 05 2022 y.

Decision of the Educational and Methodological Council of KazNRTU named after K.Satbayev. Protocol № 8 от "18" 05 2022 y.

Decision of the Academic Council of the Institute. Protocol № 8 от "28" 04 2022 y.

Vice-Rector for Academic Affairs **B. Zhautikov**

Institute Director **A. Syzdykov**

Department Head **A. Bekbotayeva**

Representative of the Council from employers **A. Zhunusov**

ELECTIVE DISCIPLINES OF THE EDUCATIONAL PROGRAM

СӘТБАЕВ УНИВЕРСИТЕТІ

SATBAYEV UNIVERSITY

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY after K. SATBAYEV

SATBAYEV UNIVERSITY

APPROVED
Director of the Institute of Geology and petroleum ngineering
_____ A. Syzdykov
«19» 05 2022.

MAJOR ELECTIVE DISCIPLINES educational program for the 2022-2023 academic year admission
Educational program 6B05203 - "Applied Geology"
Group of Educational programs B052 - "Earth Science"

Full-time study Study duration : 4 years Academic degree: bachelor of natural sciences

Year of study	Code of elective	Code of discipline	Name of discipline	semester	Cycle	Credits	Total hours	lec/lab/pr	SIW (including SIWT) in hours
			Basic geological training module						
3	3218	**GEO 603**	**Geological maping and remote methods of research**	5	Б	5	150	**2/0/1**	105
		ROB510	Fundamentals of information and measuring technologies					2/1/0	
	3219	**GEO 626**	**Basics of microscopy of rocks**	5	Б	5	150	**1/2/0**	105
		CSE626	Databases					1/1/1	
	3220	**GEO 597**	**Mathematical modeling methods in geology**	6	Б	5	150	2/0/1	105
		SEC 100	Operating System Security					1/1/1	
4	4220	**GPH 418**	**Theoretical bases and applied aspects of well logging**	7	В	6	180	**2/0/2**	120
		GPH 419	Geophysical exploration (well logging) of uranium deposits					2/0/2	
		MIN 515	Mining					2/0/2	
			Module of professional geological training						
	4305	**GEO 608**	**Industrial types and evaluation of mineral deposits**	7	П	6	180	**2/0/2**	120
		GEO 607	Geology and methods of prospecting for uranium deposits					2/0/2	
	4306	**GEO 129**	**Modern software in geology**	7	П	5	150	**2/0/1**	105
		MAP 502	Cartography and GIS in geology					1/0/2	
	4307	GEO 602	General and applied geochemistry	7	П	5	150	2/0/1	105
		GEO 183	Applied geochemical studies					2/0/1	
	4308	**GEO 605**	**Laboratory methods for studying minerals and ores**	7	П	6	180	**2/0/2**	120
		MAP 541	Remote sensing of the earth					2/0/2	
	4309	GEO 184	Geological assessment of mineral resources and reserves	7	П	5	150	2/0/1	105
		MAP 483	Aerospace survey methods					1/0/2	
	4310	**GEO 606**	**Fundamentals of mine geological survey**	8	П	5	150	**2/0/1**	105
		MAP 711	WEB-GIS in subsurface use					2/0/1	
	4311	**GEO 600**	**Geomorphology**	8	П	5	150	**2/0/1**	105
		MAP 483	Data processing of Aero photography from UAVs					2/0/1	
	4312	**GEO 601**	**Geotectonics and geodynamics**	8	П	5	150	**2/0/1**	105
		NSE 185	Theory and practice of project management					2/0/1	
		MAP 523	Geometry of subsoil					1/0/2	
			Module "R&D"						
	4307	GEO 624	Methods of laboratory research of organic matter, oil and gas	7	S	5	150	**1/1/1**	105
		GEO 609	Innovative methods of geological exploration					2/0/1	
	4312	GEO 604	Microscopic studies of minerals and rocks	8	S	5	150	**1/2/0**	105
		GEO 625	Petrography of sedimentary rocks of oil and gas bearing regions of Kazakhstan					2/0/1	

Credits numbers of elective disciplines over the entire period of study		
Cycle of disciplines		**Credits**
Cycle of basic disciplines (B)		21
Cycle of special disciplines (S)		42
Overall:		63

Decision of the Academic Council of the IG&PE. Minutes # 8, dated "28" 02 2022.

Head of the department "Geological mapping, prospecting and exploration of mineral deposits" — **A. Bekbotayeva**

Representative of the Council from employers — **A. Zhunusov**

6 GRADUATE COMPETENCE FRAMEWORK

6.1. Based on the achievement of learning outcomes in each discipline, the university has adopted the main framework descriptors of learning based on the Dublin descriptors:

a. Knowledge and understanding - by demonstrating knowledge and understanding in the field of study, formed on the basis of secondary education, including certain advanced knowledge in the field of study;

b. Application of knowledge and understanding - by applying their knowledge and understanding of actions, indicating a professional approach to the profession through a set of a number of competencies, demonstrated through the formation and justification of arguments and solutions to problems in the field of study;

c. Expression of judgments and analysis of actions - by accumulating, evaluating, processing and interpreting data, knowledge and skills in order to develop independent judgments, taking into account the analysis of social, ethical and scientific considerations;

d. Communication skills and IT skills - by transferring real and virtual information, problems, their solutions, ideas, their implementations to both specialists and non-specialists in the field of study;

e. Self-learning and existential skills - by developing the skills and abilities of independent learning and retraining with a high degree of autonomy in the field of study and related areas.

6.2. Based on the achievement of learning outcomes in each discipline, the university has adopted the following basic framework competencies:

a. Natural-scientific and theoretical-ideological competencies;
b. Socio-personal and civic competencies;
c. General engineering professional competencies;
d. Communication and IT virtual competencies;
e. Special professional competencies, including additional (Minor).

6.3. On the basis of learning descriptors and basic framework competencies, the university has adopted the following framework characteristic of graduate competencies, which guarantees the achievement of a competitive level in the professional activity market.

6.4. Based on the specified framework of competences of a university graduate, EP moderators form learning outcomes, competencies, sub-competencies and a matrix of EP competencies.

6.5. Based on the specified framework of competences of a university graduate, departments and teachers form learning outcomes, competencies, subcompetencies and a matrix of competencies of the discipline being read.

7 PROCESS OF ACCUMULATION OF COMPETENCES

7.1 Discipline (Course unit) - an independent, formally structured by the teacher learning format with a clear set of learning outcomes, learning activities in the context of time and sequence with assessment criteria, allow the student to accumulate the depth of competencies, expressed in the volume of mastered credits, upon successful completion of the discipline.

7.2 Learning outcome - a statement that a student should know, understand and be able to do at the end of the discipline, assessed by clear and transparent assessment criteria. The learning outcomes for each discipline should aim to achieve one or more of the graduate competencies noted in Section 6.2.

7.3 Assessment criteria Descriptions that are clear to the student of what the student must do at each level of assessment to maximize learning outcomes. The methods and criteria for assessment for the elements of the discipline must correspond and be consistent with the learning outcomes of the learning activities described in the course of mastering the discipline.

7.4 Competency - the ability of a student (graduate) to use knowledge, skills and personal, social, methodological abilities in professional situations, as well as in personal development. The core competencies of the graduate are set out in Section 6.2 and the achievement of one or more of them is the goal of any university discipline.

7.5 Descriptors - The learning outcomes required for a student to achieve graduate competencies reflect the depth of that achievement by the student. The university adopted the descriptors reflected in section 6.1 and close to the Dublin descriptors of the European Higher Education.

7.6 Credits (Credits) - express the volume of mastering the discipline in whole numbers at the university or other educational infrastructure, from the normatively approved by the university, by recalculating credits. Credits allow a student to accumulate an amount of credits to achieve certain qualifications as outlined in Chapter 8.

7.7 Unit competency matrix - The learning outcomes of the discipline should lead to the achievement of the competency(s) in the graduate competency matrix section 6.3.

7.8 Module (Cycle) - a certain set of disciplines expressing a single set of competencies completes the development of a certain level of student (graduate) qualification

7.9 Cycle competency matrix—The learning outcomes of a module should lead to the achievement of competencies above the minimum level of mastery of the module.

7.10 Applied Bachelor of Engineering (Associate Degree, Short Cycle) - a qualification awarded by the university when the student exceeds the minimum graduate competency framework in the amount of at least 124 credits of theoretical study with a diploma in accordance with section 8.

7.11 Secondary Bachelor's Degree (Minor) - A qualification awarded by a university when a student exceeds the minimum graduate professional competency framework of at

least 24 credits of theoretical study in another educational program with a diploma in accordance with Section 8.

7.12 Undergraduate (Academic Degree, 1st Cycle) - a qualification awarded by a university when a student reaches the maximum graduate competency framework in the amount of at least 242 credits of theoretical study with a diploma in accordance with section 8.

8 COMPETENCES ACQUIRED BY STUDENTS DURING THE MASTERING OF THE EDUCATIONAL PROGRAM"Applied Geology"

General cultural competencies (OK)	
OK 1	The ability to communicate in oral and written forms in the state, Russian and foreign languages to solve problems of interpersonal and intercultural interaction
OK 2	Understanding and practical use of the norms of a healthy lifestyle, including prevention issues, the ability to use physical culture to optimize performance
OK 3	The ability to analyze the main stages and patterns of the historical development of society in order to form a civic position
OK 4	The ability to use the foundations of philosophical knowledge to form a worldview position
OK 5	The ability to critically use the methods of modern science in practice
OK 6	Awareness of the need and the acquisition of the ability to independently learn and improve their skills throughout their working life
OK 7	Knowledge and understanding of professional ethical standards, possession of professional communication techniques
OK 8	The ability to work in a team, tolerantly perceiving social, ethnic, confessional and cultural differences
OK 9	Ability to use the basics of economic knowledge in various fields of activity
General professional competences (GPC)	
OPK-1	The ability to acquire new knowledge with a high degree of independence using modern educational and information technologies, possession of computer skills sufficient for professional activities with basic programming
OPK-2	Knowledge of the main methods, methods and means of obtaining, storing, processing information, the ability to use modern technical means and information technologies to solve communication problems using traditional media, distributed knowledge bases, as well as information in global computer networks
OPK-3	Knowledge and understanding of the structure of crystals, the ability to determine minerals, rocks, the genesis and order of crystallization of minerals in rocks, analysis and restoration of thermodynamic conditions for the formation of rocks, mineralogical, hydrocarbon, hydrogeological, geoecological and engineering-geological systems
OPK-4	Understanding and analysis of geological maps of various content (tectonic, geomorphological, minerals, hydrogeological, oil and gas potential, geoenvironmental, engineering geological, etc.), understanding the patterns of spatial distribution of regional and local structural elements of the earth's crust.
Professional competencies (PC)	
P	Professional competencies, including in accordance with the requirements of industry professional standards, providing deep theoretical knowledge and practical skills, skills in the field of geology and exploration of mineral deposits
PC 1	Knowledge and use of technologies for geological survey, prospecting, exploration, appraisal, operational, field, hydrogeological, engineering survey, geoecological,

	mineralogical, petrological works and requirements for the quality of geological materials, rules for maintaining and formalizing geological documentation.
PC 2	Knowledge, ability to select and justify methods for prospecting and exploration of mineral deposits (geochemical, lithological, geophysical, mineralogical, petrographic, lithological, etc.), the ability to determine and identify criteria and search features, based on analysis, the ability to identify promising regions and structures into various types of minerals (oil, gas, groundwater, solid minerals, including radioactive and rare earth elements)
PC 3	Knowledge of the types, technical characteristics, rules of operation, maintenance and metrological support of equipment, instruments, apparatus used in geological, hydrogeological, engineering-geological studies, skills in working with microscopes (polarization, electronic), instruments for geochemical study of the composition of minerals, rocks , ores (express analysis of the composition of rocks and minerals - spectrometers, X-ray diffraction analyzers, etc.)
PC 4	Knowledge, ability to select and justify research methods for minerals, rocks, minerals, paleontological remains, hydrocarbon substances, groundwater, skills and abilities to apply various types of research methods, the ability to compare, analyze the results and draw conclusions, draw up reports on research methods
PC 5	Knowledge of the genesis, conditions of occurrence of minerals, understanding of the connection, analysis of the conditions for the formation of oil, gas, groundwater, solid minerals, the era of ore formation; migration, concentration and conservation of ore components, hydrocarbons, groundwater in structural-tectonic, stratigraphic, lithological-sedimentary traps
PC 6	Knowledge, understanding of the principles of sampling methodology for various types of solid minerals, calculation of reserves of the studied types of minerals. Ability to solve problems of geological work using innovative technologies (modeling of geological objects and calculation of reserves in Micromine, Leapfrog, Petromod, Petrel, etc.).
PC 7	Ability to use knowledge of the legislation on subsoil and subsoil use of the Republic of Kazakhstan, international standards for geological documentation, other regulatory documents in professional activities. Knowledge of the state and prospects for the development of the mineral resource base of the region, the ability to use knowledge of the economy of mineral raw materials and geological exploration for the preparation of feasibility studies, work programs
PC 8	Geographic information systems, graphic systems, specialized office application packages (ArcGis, MapInfo, and others) used in geology, hydrogeology, oil and gas geology, engineering geology, geoecology. The ability to use advanced domestic and foreign experience in processing geological data: statistical data, data from regional geochemical, geological, hydrogeological studies to map the distribution of minerals in space and identify patterns of their distribution in the earth's crust.

9 MINOR FURTHER EDUCATION POLICY

Upon mastering at least 30 credits in the disciplines of the Mining program, including the following compulsory disciplines:

M1 - Fundamentals of mining - 5 credits

M2 - Construction of a mining enterprise - 5 credits

M3 - Mining Technology - 5 credits

M4 - Destruction of rocks by explosion - 5 credits

M5 – Open pit mining technology – 5 credits

M6 - Tunnel Construction Technology - 5 credits

and additional specialty Minor "Information systems" is assigned with the issuance of an appendix to the diploma of the established form.

10 APPENDIX TO THE ECTS DIPLOMA

The application was developed according to the standards of the European Commission, the Council of Europe and UNESCO/SEPES. This document serves only for academic recognition and is not an official confirmation of a document of education. Not valid without a high school diploma. The purpose of completing the European Annex is to provide sufficient data on the holder of the diploma, the qualification obtained by him, the level of this qualification, the content of the training program, the results, the functional purpose of the qualification, as well as information on the national education system. The application model on which grades will be translated uses the European Credit Transfer or Transfer System (ECTS).

The European Diploma Supplement makes it possible to continue education at foreign universities, as well as confirm national higher education for foreign employers. When traveling abroad for professional recognition, additional legalization of a diploma of education will be required. The European Diploma Supplement is completed in English upon individual request and is issued free of charge.

Bachelor of Engineering and Technology:

Level 4 - Geologist-technician-surveyor, geologist-technician-cartographer, IT technician in geology.

Level 5 - Geologist-specialist-surveyor, geologist-specialist-cartographer, specialist in information technologies in geology, specialist (geologist) in geological modeling.

Level 6 - Geologist-surveyor, geologist-engineer-cartographer, geochemist-engineer, information technology engineer in geology, senior geologist-surveyor, senior geologist-cartographer, senior information technology specialist in geology, engineer (geologist) in geological modeling, senior specialist (geologist) in geological modeling.

Level 7 - Chief surveyor geologist, chief geologist, chief information technology specialist in geology, chief specialist (geologist) in geological modeling.

Level 8 - the president of the enterprise, the general director.

ТИПОВАЯ ФОРМА ПРИЛОЖЕНИЯ К ДИПЛОМУ
Европейской системы перевода и накопления баллов (ECTS)

Kazakh National Research Technical University named after K.I. Satpayev
К.И.Сәтбаев атындағы Қазақ Ұлттық техникалық университеті

DIPLOMA SUPPLEMENT
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This Diploma Supplement follows the model developed by the European Commission, the Council of Europe and UNESCO/CEPES. The purpose of this supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.) It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free of any value - judgments, equivalence statements or suggestions about recognition. Information should be provided in all eight sections. Where information is not provided, a reason should be given.

1	INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION	
1.1	Family Name	
1.2	Given Name	
1.3	Date of Birth (Day/Month/Year)	Republic Region, city (place of birth)
1.4	Student Identification Number	
2.	INFORMATION IDENTIFYING QUALIFICATION	
2.1	Title of Qualification and the Title Conferred	Bachelor in Technics
2.2	Major	
2.3	Minor	
2.4	Name and Status of Awarding University in original language	Қ.И.Сәтбаев атындағы Қазақ Ұлттық техникалық зерттеу университеті
2.5	Name and Status of Awarding University in English	Kazakh National Research Technical University named after K.I. Satpayev
2.6	Language of Instruction	
3	INFORMATION ON THE LEVEL OF THE QUALIFICATION	
3.1	Level of Qualification	Bachelor's level/ first-cycle degree of higher education
3.2	Official Length of Program	4 or 3 years

English
CODE - LNG108
CREDIT - 10 (0/0/6/4)
PREREQUISITE - diagnostic test

LNG108
PURPOSE AND OBJECTIVES OF THE COURSE
The discipline in English "Beginner English" is intended primarily for learning from scratch. This course is also suitable for those who have only general basic knowledge of the language. After passing this level, the student will be able to confidently communicate on basic topics in English, learn the basics of grammar and lay a certain foundation that will allow him to improve his skills at the next stage of learning English.
Course postrequisites: Elementary English.

The discipline "Elementary English" is the foundation of learning English, which is aimed at developing students' receptive skills (reading and listening) and productive skills (writing and speaking), analyzing basic knowledge, using and memorizing the main grammatical rules and mastering the features of pronunciation and elementary vocabulary and encouraging independent learning and critical thinking.
Course prerequisites: Beginner.
Course postrequisites: General 1.

The goal of the General English 1 course is to provide students with the opportunity to gain sufficient knowledge to become more fluent in everyday social and academic settings. Students work on improving pronunciation, expanding vocabulary and grammar. At this level, the main task will be to consolidate the skills acquired earlier, learn how to compose and correctly apply complex syntactic constructions in English, and also achieve really good pronunciation.
Course prerequisites: Elementary English.
Course postrequisites: General 2.

The course "General English 2" is intended for students who continue to study "General English 1". The course is focused on the ability to actively use in practice most aspects of the tenses of the English language, conditional sentences, phrases in the passive voice, etc. At this stage, the student will be able to maintain a conversation with several interlocutors or express their point of view. The student significantly expands his vocabulary, which will allow him to freely express his thoughts in any environment. At the same time, speech will be replenished with various synonyms and antonyms of already familiar words, phrasal verbs and set expressions.
Course prerequisites: General 1.
Course postrequisites: Academic English.

The main goal of the English language course "Academic English" is to develop academic language skills. The discipline is a language style that is used when writing academic papers (paragraph, annotation, essay, presentation, etc.). This course is designed to help students become more successful and effective in their learning, developing critical thinking and independent learning skills.
Course prerequisites: General 2.
Course postrequisites: Professional English.

"Business English" is the English language for business communication, business and career. Knowledge of business English will be useful for negotiating and business correspondence, preparing presentations and informal communication with business partners.
The peculiarities of the preparation are that it is necessary not only to master the vocabulary, but also to master new skills: presentational, communicative, linguistic, professional.
Course prerequisites: IELTS score 5.0 and/or Academic English
Course postrequisites: Professional English, IELTS score 5.5-6.0

The "Professional English" course is designed for B2+ level students, the aim of which is to improve the language competence of students in their respective professional areas. The main goal of the course is to teach students to work with texts, both audio and written, in their specialty. The curriculum is built on the necessary vocabulary (words and terms) often used in English for specific purposes. Students will acquire professional English language skills through content and language-based integrated learning, acquire the vocabulary to read and understand original sources with a great degree of independence, and practice different communication patterns and vocabulary in specific professional situations.
Course prerequisites: Business English.
Course postrequisites: any elective course.

Kazakh/Russian language
CODE - LNG104
CREDIT - 10 (0/0/6/4)
PREREQUISITE - diagnostic test

PURPOSE AND OBJECTIVES OF THE COURSE
- to teach students to perceive by ear statements on well-known topics related to home, study, free time;
- understand texts on personal and professional topics containing the most frequent words and expressions;
- be able to carry on a conversation on everyday topics; describe your experiences; tell your opinion; retell and evaluate the content of a book read, a film seen;
- be able to create simple texts on well-known topics, including those related to professional activities.

BRIEF DESCRIPTION OF THE COURSE
The language material of the course is selected in such a way that the student, learning the lexical and grammatical minimum, has the opportunity to get acquainted with typical communicative situations and find himself in such situations, be able to correctly assess them and choose the appropriate model (strategy) of speech behavior.
In this case, the main emphasis of learning is transferred from the process of transferring knowledge to learning the ability to use the target language in the course of various types of speech activity, which are reading (subject to reading comprehension), listening (under the same condition) and the production of texts of a certain complexity with a certain degree of grammatical and lexical correctness.
The material for the classes is selected so that students, studying the Kazakh / Russian language, acquire the skills of reading, writing and understanding sounding speech based on the simultaneous development of the basics of grammar (phonetics, morphology and syntax) and word usage in the course of constant repeated repetition with a gradual complication of tasks.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
The student, subject to the active organization of work in the classroom and the conscientious completion of homework, by the end of the first semester, acquires the skills corresponding to the pan-European level A2 (Threshold according to the ALTE classification), that is, he is on the threshold of the level of independent language proficiency.

Information and Communication Technologies (in English)
CODE – CSE677
CREDIT - 5 (2/1/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE

– Training in the skills of applying modern information technologies in the field of professional activity. Course objectives include:
– To reveal the basic concepts of architecture of computer systems;
– To reveal the basic concepts of information and communication technologies and subject terminology;
– To teach how to work with software interfaces of operating systems;
– To teach how to work with data in various representations, both in tabular structured and unstructured form;
– Teach how to apply the basic principles of information security;
– Expand the concepts of data formats and multimedia content. Learn how to work with typical multimedia data processing applications. Use modern approaches to the presentation of material;
– To reveal the concepts of modern social, cloud and email platforms and how to work with them;
– To teach how to use algorithmization and programming methods to solve business process automation problems

BRIEF DESCRIPTION OF THE COURSE

The course contains a training program aimed at leveling the basic knowledge of students in the field of information and communication technologies. It contains a full range of topics, according to the SCES Standard Curriculum, with a predominance of developing practical skills in working with data, algorithmization and programming. The course is designed in such a way as to teach students not only the basic concepts of architecture and modern infrastructure of information and communication technologies, but also teach how to use these tools to solve applied problems. To teach how to optimize processes, apply adequate models and methods for solving practical problems using modern methods and tools of information technology, automate routine processes, be productive and efficient.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

Students will know:
– Computer device;
– Computer systems architecture;
– Infrastructure of information and communication technologies;
– Interfaces of modern operating systems;

– Modern tools for working with data of various nature and purpose;
– Types of threats to information security, principles, tools and methods of data protection;
– Python programming language.

Students will be able to:

- Work with the interfaces of modern operating systems;
- Work with modern application software for working with data of various nature and purpose;
- Apply modern social, cloud, email platforms to organize business processes;
- Program in an algorithmic programming language;
- Analyze, model, design, implement, test and evaluate information and communication technology systems

Physical Culture
CODE – KFK 101-104
CREDIT - 8 (0/0/8/0)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of mastering the discipline "Physical culture" is the formation of a person's physical culture, the presence of which ensures readiness for social and professional activities, inclusion in a healthy lifestyle, systematic physical self-improvement.

BRIEF DESCRIPTION OF THE COURSE
Theoretical foundations of physical culture. Physical culture in the general cultural and professional training of students. Methodological and practical section. Socio-biological foundations of physical culture. Fundamentals of a healthy lifestyle for students. Physical culture in ensuring health. General physical and special training in the system of physical education. Fundamentals of methods of self-study Physical exercises and self-control involved in physical exercises and sports.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, the student must:
Know: the influence of health-improving systems of physical education on health promotion, prevention of occupational diseases and bad habits;
- ways of monitoring and evaluating physical development and physical fitness;
- rules and methods of planning individual lessons of various target orientation.

Be able to: overcome artificial and natural obstacles using a variety of modes of movement;
- to carry out creative cooperation in collective forms of physical culture lessons;
- organize the daily routine in accordance with the criteria of a healthy lifestyle;
- explain the importance of volitional qualities, emotions in the formation of psychophysical qualities.

Have skills: the use of physical culture to increase resistance to various environmental conditions;
- organization and conduct of individual, collective and family recreation and participation in mass sports competitions.

Modern history of Kazakhstan
CODE - HUM100
CREDIT - 5 (1/0/2/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course is to familiarize students of technical specialties with the main theoretical and practical achievements of domestic historical science on the problems of the history of modern Kazakhstan, a comprehensive and systematic study of the main stages of the formation and development of Kazakhstani society.
- analyze the features and contradictions of the history of Kazakhstan in the Soviet period;
- to reveal the historical content of the foundations of the laws of political, socio-economic, cultural processes at the stages of the formation of an independent state;
- contribute to the formation of the civic position of students;
- to educate students in the spirit of patriotism and tolerance, belonging to their people, the Fatherland.

BRIEF DESCRIPTION OF THE COURSE
The course Modern history of Kazakhstan is an independent discipline and covers the period from the beginning of the twentieth century to the present day. The modern history of Kazakhstan studies the national liberation movement of the Kazakh intelligentsia at the beginning of the 20th century, the period of the creation of the Kazakh ASSR, as well as the process of the formation of a multinational society.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
- knowledge of events, facts and phenomena of the modern history of Kazakhstan;
- knowledge of the history of ethnic groups inhabiting Kazakhstan;
- knowledge of the main stages of the formation of the Kazakh statehood;
- the ability to analyze complex historical events and predict their further development;
- ability to work with all types of historical sources;
- the ability to write essays and scientific articles on the history of the Fatherland;
- ability to operate with historical concepts;
- the ability to lead a discussion;
- skills of independent analysis of historical facts, events and phenomena;
- public speaking skills.

Socio-political knowledge module (culturology,psychology)
CODE – HUM134
CREDIT - 5 (1/0/0/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
Course objective:
to form in undergraduate students an understanding of the specifics of the development of national culture in the context of world culture and civilization, the need to preserve the cultural code of the Kazakh people, skill in independent professional activities to pursue a strategy for preserving the cultural heritage of the Kazakh people in a dynamically changingmulticultural world and society.
Course objectives:
- describe the morphology and anatomy of culture as a system of parameters and forms in contexts: nature, man, society;
- explain the origin and essence of signs, meanings, archetypes, symbols as a system of cultural code through correlation with the type of material culture, determined by the way of being;
- streamline information about the cultural heritage of the inhabitants of Kazakhstan and determine the channels of their influence on the formation of the culture of the Kazakh people;
- classify the cultural capital of the Turks, streamline the forms and channels of cultural interaction with the peoples of Western Europe, the Middle East, identify their contribution to the intellectual and cultural history of mankind and the Kazakh people;
- reasonably and reasonably present information about the various stages of the development of Kazakh culture as a factor in the preservation of cultural heritage;
- give an objective assessment of the national cultural heritage from the standpoint of maintaining the status of Kazakh culture, the Kazakh language and their role in the formation of cultural and national identity;

BRIEF DESCRIPTION OF THE COURSE
The course is intended for students of the EP "Culturology" aimed at the development of a social and humanitarian worldview as the basis for the modernization of public consciousness through the formation of cultural identity, the ability to analyze and evaluate cultural situations based on understanding the nature of cultural processes, the specifics of cultural objects, the role of cultural values in intercultural communication.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
- As part of the course, the student will master the practical use of cultural studies methods in various aspects of life.

- Basic knowledge and skills in the field of philosophy and cultural studies will be presented, as well as methods of comparison, analysis, synthesis, and resolution of the situation by the method of dialogue.

At the end of the course the student should know:

- information about the cultural heritage of the inhabitants of Kazakhstan and determine the channels of their influence on the formation of the culture of the Kazakh people;
- classification of the cultural capital of the Turks, to streamline the forms and channels of cultural interaction with the peoples of Western Europe, the Middle East, to identify their contribution to the intellectual and cultural history of mankind and the Kazakh people;
- - reasonably and reasonably present information about the various stages of development of Kazakh culture as a factor in the preservation of cultural heritage and Kazakh language, including modern state programs for its development and modernization.

Socio-political knowledge module (sociology, politology)
CODE - HUM134
CREDIT - 2 (1/0/0/1)
PRE-REQUISITE - no

- PURPOSE AND OBJECTIVES OF THE COURSE
- The purpose of the course is the political socialization of students of a technical university, providing the political aspect of training a highly qualified specialist on the basis of modern world and domestic political thought.
- The objective of the course is to provide the future specialist with primary political knowledge, which will serve as a theoretical basis for understanding political processes, for forming a political culture, developing a personal position and a clearer understanding of the measure of one's responsibility.
-
- BRIEF DESCRIPTION OF THE COURSE
- The political science course is designed to introduce students to the basics of political science and
- to form in them a general idea of the policy, its main aspects, problems,
- regularities and interaction with other spheres of public life.
-
- KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
- At the end of the course the student should know:
- basic conceptual apparatus of political science;
- main methodological approaches and paradigms of political science
- system of power relations
- The student must be able to:
- - analyze the features of political systems and the functioning of political institutions;
- critically evaluate the theoretical approaches of political science;
- to compare political systems, institutions and actors in an intercountry and subnational context, based on the knowledge gained and the methods mastered;
- - to make proposals and recommendations to public authorities.
- Formation of critical thinking skills and the ability to apply it in practice. Development of skills for describing and analyzing actual problems of modern society, the essence of social processes and relations.

Fundamentals of Anti-Corruption Culture
CODE – MNG133
CREDIT - 5 (2/0/2/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the discipline is to gain practical skills in entrepreneurial activities, to get acquainted with theories and types of leadership, and to understand the foundations of an anti-corruption culture.

BRIEF DESCRIPTION OF THE COURSE
Students will study the theory and practice of entrepreneurship as a system of economic, organizational and legal relations between business structures. They will develop their leadership and teamwork skills. They will also study the causes of corruption and methods to combat it.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, the student:
1. must know:
- issues of discipline to the extent necessary to solve professional problems;
- the mechanism of entrepreneurship, taking into account the accumulated experience in the development of theory and practice;
- application of civil legislation regulating the organization of entrepreneurial activity;
- basic concepts and terms.
2. must be able to:
- choose the organizational and legal form of the enterprise based on the goals of the enterprise and the characteristics of the organization and functioning of enterprises in various forms;
- evaluate the effectiveness of entrepreneurial activity;
- evaluate external and internal risks for the enterprise;
- develop business plans taking into account regulatory, resource, administrative and other conditions.
3. must own:
- methods of planning activities and evaluating the effectiveness of entrepreneurial activities, methods of assessing the value of a business;
- methods of protecting entrepreneurs from encroachments on their assets

Fundamentals of Entrepreneurship and Leadership
CODE - HUM127
CREDIT - 2 (1/0/0/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: the formation of theoretical knowledge about society as an integral system, its structural elements, connections and relationships between them, the features of their functioning and development, as well as existing sociological theories that explain social phenomena and processes.
The tasks of mastering the discipline:
- the study of the basic values of social culture and the willingness to rely on them in their personal, professional and general cultural development;
- study and understanding of the laws of development of society and the ability to operate with this knowledge in professional activities;
- the ability to analyze socially significant problems and processes, etc.

BRIEF DESCRIPTION OF THE COURSE
The discipline is designed to improve the quality of both general humanitarian and professional training of students. Knowledge in the field of sociology is the key to the effective professional activity of a future specialist, which is impossible in the conditions of modern society without understanding social processes, as well as without mastering the skills of their correct interpretation.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student must:
know:
- features of the sociological approach to the interpretation of the basic concepts and terms of the social sciences;
- main classical sociological theories and schools;
- key concepts of sociology: society, group, socialization, social facts and social actions, norms, values, social structure, mobility, culture, social institution, social organization, social process, etc.;
- basic approaches to identifying and analyzing the social structure of society, social changes;
- the main patterns of the course of social processes and the mechanisms of functioning of the main social communities;
- patterns of socio-economic, political and managerial processes, the main approaches to their study, as well as the features of their application;
be able to:

• describe the processes taking place in society and the observed phenomena using sociological terminology;
• explain the differences in approaches to the definition of sociological concepts;
• consider social phenomena, institutions and processes from different points of view, argue their own position on the problem, comparing and comparing some theoretical perspectives;
• find, analyze and present factual data, analytical information about social groups, institutions, processes and phenomena, revealing abstract concepts using examples using various kinds of data;
own:
• the ability to use sociological knowledge in practice to analyze the phenomena and events of social reality;
• skills of independent individual preparation, constructive communication and performance of appropriate roles in the implementation of group projects, participation in discussions;
• presenting the results of individual and group analytical work in written and oral form;
• skills of academic and grammatically correct writing, text structuring, source processing, design of the reference apparatus.
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Ecology and life safety
CODE – CHE656
CREDIT - 5 (2/0/2/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the discipline "Life Safety" is to form students' ability to recognize and evaluate the negative factors of the human environment, to determine the consequences for a person of harmful and damaging factors, to implement reliable methods of protection against them, to choose the best solution and correct behavior, safety and preservation of life during emergency natural, man-made and social situations.
The tasks of mastering the academic discipline: acquiring an understanding of the problems of sustainable development, ensuring life safety and reducing the risks associated with human activities; formation of a culture of professional safety, the ability to identify hazards and assess risks in the field of their professional activities

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student should know:
- main technosphere hazards, their properties and characteristics,
- the nature of the impact of hazardous and harmful factors on humans and nature, methods of protection against them;
- the specifics and mechanism of the toxic effects of harmful substances, energy effects and the combined action of factors;
- technical and organizational bases for ensuring the safety of production processes, sustainability of production in emergency situations;
- theoretical foundations for ensuring life safety; the current system of regulatory legal acts in the field of technosphere safety;
- security management system;

be able to:
- - identify the main hazards of the human environment, assess the risk of their implementation, choose methods of protection against hazards and ways to ensure comfortable living conditions;
- use basic means of environmental quality control;
- apply methods for analyzing the impact on humans and their activities with the environment;

own:
- - legislative and legal acts in the field of safety and environmental protection, safety requirements of technical regulations;
- ways and technologies of protection in emergency situations;
- conceptual and terminological apparatus in the field of security; methods of ensuring the safety of the environment.

Mathematics I
CODE - MAT101
CREDIT - 5 (1/0/2/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of the course is to give the future specialist a certain amount of knowledge in the sections of the course "Mathematics-I", which is necessary for studying related engineering disciplines. Introduce students to the ideas and concepts of calculus. The main attention should be paid to the formation of basic knowledge and skills with a high degree of their understanding of differential and integral calculus.
Course objectives:
acquisition of knowledge necessary for the effective use of rapidly developing mathematical methods; obtaining the skill of building and researching mathematical models; possession of the fundamental sections of mathematics necessary for solving research and practical problems in the professional field.

BRIEF DESCRIPTION OF THE COURSE
The course "Mathematics-I" provides a summary of the sections: introduction to analysis, differential and integral calculus

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
The studythis discipline will allow the student to apply the course "Mathematics-I" to solving simple practical problems, to find tools sufficient for their research, and to obtain numerical results in some standard situations.

Mathematics II
CODE - MAT102
CREDIT - 5 (1/0/2/2)
PREREQUISITE - Mathematics 1

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of teaching the course "Mathematics II" is to form in bachelors ideas about modern mathematics as a whole as a logically coherent system of theoretical knowledge. The objectives of the course are to instill in students solid skills in solving mathematical problems with bringing the solution to a practically acceptable result. To develop the primary skills of mathematical research of applied issues and the ability to independently understand the mathematical apparatus contained in the literature related to the student's specialty.

BRIEF DESCRIPTION OF THE COURSE
The course "Mathematics-II" provides an accessible presentation of sections: elements of linear algebra and analytic geometry, differential calculus of functions of many variables, multiple integrals. "Mathematics II" is a logical continuation of the course "Mathematics I".

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
The studythis discipline will allowapply in practice the acquired theoretical knowledge and skills with a high degree of understanding of the sections of the course, use them at the appropriate level; translate into mathematical language the simplest problems posed in terms of other subject areas; acquire new mathematical knowledge using educational and information technologies; solve applied problems in the field of professional activity

Physics
CODE – PHY468
CREDIT - 5 (2/2/0/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of teaching the course PhysicsI is to form ideas about the modern physical picture of the world and the scientific worldview.

BRIEF DESCRIPTION OF THE COURSE
The disciplines Physics ise the basis for theoretical training and for engineering and technical activities of graduates of a higher technical school and represent the core of the physical knowledge necessary for an engineer operating in the world of physical laws. The course "Physics" includes sections: the physical foundations of mechanics, the structure of matter and thermodynamics, electrostatics and electrodynamics. The discipline "Physics" is a logical continuation of the study of the discipline "Physics ", and forms a holistic view of the course of general physics as one of the basic components of the general theoretical training of bachelors of engineering and technical profile. The discipline "Physics" includes sections: magnetism, optics, nanostructures, fundamentals of quantum physics, atomic and nuclear physics.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
– the ability to use knowledge of fundamental laws, theories of classical and modern physics, as well as the use of physical research methods as the basis of a professional activity system.

Engineering and computer graphics
CODE – GEN429
CREDIT - 5 (1/2/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The course is intended for students of the EP of the technical direction and is aimed at the formation and development of spatial and logical thinking among students.
As part of the course, the student will master the practical use of the AutoCAD graphic program, solving positional and metric problems using line and surface models in parallel axonometry and Monge diagrams.
This discipline will present basic knowledge and skills in the field of descriptive geometry, engineering and computer graphics, as well as methods for solving problems related to spatial forms and their relationships using graphic models.
The final stage of the course is an exam.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
Upon completion of the course, the student must demonstrate the ability to analyze, synthesize and design, as well as use the methods of projection drawing, geometric modeling, drawing in axonometry.
The student must be able to:
- solve various positional and metric problems on a complex drawing, axonometry;
- be able to solve problems on the design of surfaces;
- work with various drawing and measuring tools, devices.
At the end of the course the student should know:
- the basic principles of the discipline, the basic requirements for the design process in practice; regulations;
- the main professional functions of an engineer, including the competent application of the theoretical foundations of descriptive geometry;
- information computer technologies (ICT) used in the work;
- basic methods and principles of axonometry and diagrams;
- own:
- geometric methods for solving positional and metric problems;
- methods of depicting spatial forms on a plane;
- ways of graphic solution of various geometric problems related to the original;
- skills to read and execute projection drawings of an object;
- skills to create different geometric designs.
A student who has successfully completed the course must: 1. Have an understanding of graphic systems, machine representation and object creation. 2. Orientate in the field of computer modeling and design of flat and volumetric models.

Physical geology
CODE - GEO489
CREDIT - 4 (2/1/0/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: development of students' geological outlook; creation of a basis for further obtaining special knowledge, skills and abilities in the process of studying all subsequent geological disciplines.
Course objective: obtaining general ideas about the structure of the Universe, the internal structure of the Earth, the geological activity of the main factors of its external and internal dynamics, the form of occurrence of geological bodies, tectonic movements and methods for their study, the main structures of the earth's crust.

BRIEF DESCRIPTION OF THE COURSE
The course "Physical Geology" considers the geological structure of the earth's crust; material (chemical, mineral and petrographic) composition of the earth's crust; the main structural elements of the earth's crust with their characteristic rock complexes; the main results of the most important endogenous and exogenous geological processes and their role in the formation of the earth's crust; forms of occurrence of geological bodies in the earth's crust, types of tectonic disturbances; methods of their representation on geological maps and sections, the concept of a geochronological (stratigraphic) scale.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know: the internal structure of the Earth,
– geological activity of the main factors of its external and internal dynamics,
– forms of occurrence of geological bodies, tectonic movements and methods for their study, types of structurestectono- and lithosphere.
2) be able to:
- independently determine the most common minerals and rocks and explain their genesis;
- recognize simple tectonic structures, geological bodies and landforms;
3. own skills:
- work with a mountain compass;
- building geological maps of a simple structure and geological sections, reading simple geological maps.

Structural geology
CODE - GEO432
CREDIT - 5 (2/1/0/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: structural geology studies the various forms of rock occurrence, their location and relationships, the conditions of formation in the earth's crust. The completion of the study of the discipline is a term paper. It aims to consolidate skills in reading geological maps. Based on an in-depth analysis of the geological tablet, an explanatory note is drawn up, illustrated with graphic applications (maps, sections). Completed term papers, after checking by their supervisor, are protected by performers and are accepted with a differentiated assessment.
Course objective:
– study of the form of occurrence of rocks in the earth's crust;
– methods for compiling and reading geological, tectonic and structural maps,
– construction of geological sections and block diagrams, stratigraphic columns

BRIEF DESCRIPTION OF THE COURSE
The course "Structural Geology" studies the forms of geological bodies, undisturbed horizontal layers, deformations of rock layers, formation of layers under the influence of endogenous, exogenous and space factors; main elements of folds, typification of folds, folded forms of high ranks (anteclises, syneclises, etc.); main elements of discontinuous dislocations, their typification; kinematic types of faults (faults, reverse faults, shifts, etc.); features of the manifestation of deformations on platforms, in folded belts, rifts and other global tectonic structures

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
– the forms of occurrence of geological bodies in the earth's crust and the patterns of their placement and combination, as well as the geological conditions of formation;
– methods for compiling and reading geological, tectonic and structural maps, geological sections and block diagrams, stratigraphic columns;
– about the close connection between the study of the structural forms of geological bodies with the practice of geological exploration and with theoretical geology.
2) be able to:
– determine the elements of occurrence of rock layers using a mountain compass (strike azimuth, dip angle, etc.);
– according to well drilling data, using structural maps; display folded forms and discontinuous dislocations on geological maps and sections;

– use general and special computer programs for processing structural and geological information;
– read geological maps, build geological sections, stratigraphic columns,
– correctly describe the geological structure of the area according to the geological map in accordance with the scheme of the production report.
3) master the skills:
– studying the morphometry of structural forms,
– development of their classification in connection with the regular distribution and combination in the earth's crust to depth and area;
– analysis of the geological, tectonic structure of the area and understanding of the history of the geological development of the area.

Crystallography and mineralogy
CODE - GEO196
CREDIT - 6 (2/2/0/2)
PREREQUISITE – GEO489 Physical Geology

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: Students gain knowledge on the basic theoretical and applied issues of crystallography and mineralogy, which is a fundamental geological discipline that underlies the study of rocks, ore and non-metallic minerals, processes occurring in the earth's crust, as well as in cosmic bodies
Course objective:
– mastering the basics of crystallography, which is closely connected with industry, the development of which requires specialists to have in-depth knowledge in the field of crystallography;
– the acquisition of skills in determining the elements of symmetry in crystalline polyhedra, in recognizing simple shapes that are found in nature;
– possession of methods of visual diagnostics of common minerals;
– obtaining knowledge on the diagnosis of minerals by morphological features;
– the ability to use paragenetic associations of minerals for the diagnosis of minerals;
– obtaining knowledge on the conditions for the formation of the main minerals.

BRIEF DESCRIPTION OF THE COURSE
The course "Crystallography and Mineralogy" studies the basic concepts and laws of crystallography; classification of crystals based on their symmetry; geometric crystallography, which studies the external and internal structure of crystals; crystal chemistry or structural chemistry; crystal physics. Understands the influence of the structure on the external shape and physical properties of crystals, the main motives for constructing structures - frame, sheet, tape, chain, with isolated groups of atoms; conditions of origin and location of minerals in nature; the main groups of minerals, their composition, physical properties and practical application, the processes of mineral formation and their corresponding mineral paragenesis; the basic laws of the crystal structure, external forms, chemical composition, physical properties and conditions for the formation of crystals in the relationship.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
– the history of crystallography and mineralogy as a science, the relationship with other exact and natural sciences, the main modern problems and development prospects, the basic laws of crystallography;

– the state of aggregation of a mineral as a solid body, the concept of a crystal and a crystalline substance, their basic properties;
– symmetry and classification of crystals;
– common simple forms of crystals, their parameters and indices, combinations of simple forms;
– fundamentals of the theory of crystal growth, factors affecting the growth of crystals, shapes of real crystals;
– general theoretical representations of the foundations of mineralogy, the definition of a mineral and its chemical composition, physical properties4
– geological processesmineral formation, basic terms and definitions;
– principles of classification of minerals.

2) be able to:
– identify the natural crystal of the mineral, its genetic affiliation;
– apply the methods of visual diagnostics of the mineral, determine the common ore and rock-forming minerals in the samples;
– analyze the paragenetic association of the mineral and reconstruct the chemistry of the environmentmineral formation.

3) master the skills:
– methods for determining the symmetry of crystals, their crystallographic classification, parameters and indices of simple shapes;
– methods of visual diagnostics of minerals, analysis of paragenetic associations;
– methods for diagnosing minerals, including the determination of their crystal-morphological, physical properties, analysis of mineral associations and chemistry of the environmentmineral formation.

Petrography with the basics of petrology
CODE - GEO509
CREDIT - 5 (1/2/0/2)
PREREQUISITE – GE0196 Crystallography and mineralogy

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: a comprehensive knowledge of the composition, structure, structure and texture, the classification of igneous, sedimentary, metamorphic, metasomatic rocks, the nomenclature and conditions for the formation of rocks and the relationship of mineral deposits with them.
Course objective:
– Study of igneous rocks: formation, material composition and structure. Structures and textures of igneous rocks.
– Study of sedimentary rocks: formation, material composition, structure. Textures and structures of sedimentary rocks. Classification of sedimentary rocks.
– Study of metamorphic rocks: factors and types of metamorphism, material composition, structure. Textures and structures of metamorphic rocks. Types of metamorphism: cataclastic, contact-thermal, regional, metasomatism.

BRIEF DESCRIPTION OF THE COURSE
The course "Petrography with the basics of petrology" studies the composition, structure, conditions of occurrence, classification and patterns of formation of igneous, sedimentary, metamorphic and metasomatic rocks that meet the current level of science and the requirements of geological practice. Understands the relationship of petrography with other geological disciplines and its importance for geological surveying, prospecting and exploration of mineral deposits; applies methods of studying rocks; main problems and tasks of petrography.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
one) know:
– the structure of the Earth, the history of the geological development of the planet,
– main geological processes, basics of petrography
– the most important types of rocks of igneous, sedimentary and metamorphic genesis,
– their systematics
– assessment of the formation conditions,
– diagnostic methods
2) be able to:
– explain the origin of the most common mineralsand rocks, landforms, elementary geological structures;

– use petrographic information to reconstruct rock formation processes

3) master the skills:

– skills in identifying types of rocks and minerals

– determine the main types of rocks by external signs, describe the composition, structure and texture of rocks.

Geodesy
CODE - MAP 160
CREDIT - 5 (2/1/0/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: to acquaint students with the science that studies the shape and size of the Earth's surface or its individual parts through measurements, in the mathematical processing of measurements with the construction of maps, plans used to solve engineering and other problems.
The objective of the course: is to teach future specialists in the geological industry the basics of theoretical and practical knowledge in solving problems on topographic maps and plans; a complex of geodetic studies related to the implementation of topographic surveys for the preparation of large-scale plans; angular and linear measurements by optical-mechanical and electronic geodetic devices; in the mathematical processing of field measurements based on direct and inverse geodetic problems in accordance with the requirements of the instructions; determination of coordinates and elevations of points on the earth's surface in a single coordinate system; in the construction of the processed data on a plan or in a profile.

BRIEF DESCRIPTION OF THE COURSE
The course contains a training program that gives the basic concepts of the shape and size of the Earth, the coordinate systems used in geodesy, the orientation of lines on the ground, plans, maps, profiles, scale, terrain, angular and linear measurements, various planned - high-altitude shooting. The course is designed in such a way as to teach the student not only the basic concepts, but also to teach how to perform field work of various vertical and vertical surveys, process field measurements of various horizontal and vertical surveys, build and draw up a plan or profile when solving engineering problems using equipment and technology, according to the requirements of the labor market.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
one. know:
- about the shape and dimensions of the Earth and its individual parts of the surface, about how to depict them on a map, about the close connection of geodesy with all the technological processes of a mining enterprise;
- the device of the main geodetic instruments, the methodology for performing angular, linear and height measurements on the earth's surface, the rules for office processing of geodetic measurements, the basic requirements for compiling topographic documentation.

2) be able to:
- to use topographic and geodetic material in solving practical problems of mining;
- perform the simplest geodetic measurements and stakeouts during the operation of mineral deposits.
3) master the skills: with geodetic instruments, performing angular, linear and height measurements on the ground, performing basic geodetic surveys, performing computational and graphic work when processing the results of geodetic measurements and solving engineering problems according to plans and maps.

Chemistry
CODE - CHE495
CREDIT - 5 (1/1/1/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: Formation of knowledge on the fundamental issues of general chemistry and the skills of their application in professional activities.
Course objective:
- transfer basic theoretical knowledge in the course of chemistry;
- help students gain laboratory skills;
- teach how to solve typical problems and paint reaction equations;
- which contributes to the informal assimilation of theoretical material;
- to form students' chemical thinking skills.

BRIEF DESCRIPTION OF THE COURSE
The course "General Chemistry" considers the laws, theoretical provisions and conclusions that underlie all chemical disciplines, studies the properties and relationships of chemical elements based on the periodic law of D.I. Mendeleev and on modern ideas about the structure of matter, the basics of chemical thermodynamics and kinetics, processes in solutions, the structure of complex compounds.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
– basic chemical laws and concepts,
– various chemical systems
– basic laws of chemical reactions,
– the reactivity of substances based on knowledge of the structure of atoms, the periodic system of elements and chemical bonds.
2) be able to:
– solve problems using acquired knowledge,
– write reaction equations
– make calculations using the basic chemical laws.
3. own skills:
- navigate the basic concepts of chemistry, the properties of elements - non-metals and metals of groups of the periodic system;
- acquire the skills of compiling chemical equations, solving problems, explaining the properties of elements and their compounds based on the laws of chemistry, conducting chemical experiments and explaining the phenomena that occur.

Geology of Kazakhstan
CODE - GEO104
CREDIT - 5 (2/1/0/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: Formation of a holistic view of the geological structure and development of the earth's crust within the territory of Kazakhstan, acquaintance with the main types of mineral resources, the provision of the country with them in the future and priorities in the mineral resource complex.
Course objective:
– study of the geological structure of the bowels of Kazakhstan;
– acquaintance with the basic principles of tectonic zoning of the territory of Kazakhstan;
– acquaintance with the main tectonic structures of the earth's crust, their stratigraphy and igneous complexes, features and patterns of geological development and the placement of mineral deposits in them.
The main task of studying the discipline is to develop geological thinking among students of geologists, based on an extensive base of factual material with the ability to competently structure it and use it in accordance with the logic of fundamental conceptual geological paradigms.
study of the form of occurrence of rocks in the earth's crust;

BRIEF DESCRIPTION OF THE COURSE
An idea is given about the geological structure of the subsoil and the development of the earth's crust within the territory of Kazakhstan, about the mineral resources of Kazakhstan, their classification, reserves, priority and strategic types of raw materials. Tasks of the geological service of Kazakhstan at the present stage. The course contains information about the main types of mineral resources, the provision of the country with them in the future and priorities in the mineral resource complex.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) to know: about the features of the geological structure and the history of the development of the earth's crust in the territory of Kazakhstan, to know the main types of mineral resources of the republic, the degree of provision of the country with them at the present time and in the future. Know the principles of tectonic zoning of the territory of Kazakhstan, the main structural elements of the earth's crust of this territory, the main types of minerals and the general patterns of placement of their deposits within the republic.

2) be able to: analyze the geological structure of any part of the earth's crust, compose its integral characteristics and interpret the conditions for its development in time and space.
3) master the skills of: compiling geological sections and tectonic maps of various scales, reading and compiling schematic geological maps of various contents.

Lithology
CODE - GEO610
CREDIT - 5 (2/1/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
Formation of students' knowledge and skills, development of competence in the field of composition and structure of sedimentary rocks, the geological bodies they compose, the origin and patterns of their spatial and geochronological distribution, favorable conditions for the formation of oil and gas fields.
Course objective: Studying the classification of sedimentary rocks, types of lithogenesis, methods of lithological studies of rocks, the main stages of the formation and transformation of sedimentary rocks, determining and describing the composition, structure and texture of rocks, generalizing analytical data.

BRIEF DESCRIPTION OF THE COURSE
Lithology and oil and gas sedimentology is one of the main disciplines required for a specialty that studies issues affecting the material composition, structural and textural features, formation conditions, stages of lithogenesis, sedimentation conditions and sedimentation conditions, as well as the relationship of rocks with oil and gas fields. The causes and conditions for the occurrence of oil-bearing and source rocks, as well as the periodicity of sedimentation, are studied. In addition to the theory of lithogenesis, students must acquire the skills to describe the main varieties of sedimentary rocks in samples and thin sections, using a polarizing microscope and other laboratory methods.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
- methodology for determining the types of sedimentary processes and conditions of sedimentation and their stratigraphic features;
- study of the transfer and transportation of clastic material;
2) be able to:
- determine the features and varieties of oil and gas traps;
- types of rocks composing them, to determine the conditions of sedimentogenesis;
- collector distribution systems;
3) master the skills:
- construction of litholo-stratigraphic sections, paleogeographic maps,
lithological analysis and its application in practice.

Geoinformation systems in geology
CODE - GEO592
CREDIT - 5 (2/1/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: to give theoretical and practical knowledge in the field of geoinformation system in relation to the tasks of geology. Development of practical skills in modern geographic information systems.
Course objective: When studying the discipline, specialists should learn digital data processing technologies, technologies for creating and updating information databases, creating digital geological maps and plans

BRIEF DESCRIPTION OF THE COURSE
The concept of geoinformatics. The concept of spatially-referenced information and the main ways to obtain it. Data of geographic information systems and ways to create a digital basis for geographic information systems. GIS software. Technologies for creating maps of geological content in geographic information systems. Remote basis of geological mapping.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
– principles and methods of mathematical modeling in geology; main types of models and features of their application; computer analysis of geoinformation;
– geoinformation systems in geological mapping;
2) be able to:
– to model the properties of geological objects;
– make maps for various purposes using GIS technologies
3) master the skills:
– construction of mathematical, physical and chemical models in solving production problems;
- Mapping using GIS technologies.

Applied Geophysics
CODE - GE0591
CREDIT - 5 (2/1/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
Purpose of the course: Applied geophysics is widely used in solving the problems of geological mapping, prospecting and exploration of deposits of ores, non-metallic raw materials and hydrocarbons
Course objective:
As a result of studying this course, a geologist must learn the basics of geophysical methods, the principles of operation of measuring equipment, acquire the skills of independent work with geophysical materials, learn how to carry out their qualitative, and in some cases, quantitative interpretation. Most important for a geologist is the ability to creatively apply geological knowledge to explain the causes of geophysical anomalies.

BRIEF DESCRIPTION OF THE COURSE
The physical and geological foundations, methods and techniques of work, processing and interpretation of the results of field, geophysical methods (electrical prospecting, magnetic prospecting, gravity prospecting, seismic prospecting, radiometry and nuclear geophysics) are outlined. The physical properties of rocks and the nature of the physical fields associated with them are considered. The principles of operation and the design of geophysical equipment, methods for performing field measurements and processing the data obtained are described, and the scope is indicated. Field geophysical measuring instruments require students to have knowledge of electrical engineering, electronic measurement systems. In terms of the volume of collected field geophysical data, their processing and interpretation requires the use of computer technologies.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
– modern ideas about the geological nature of geophysical anomalies;
– methods of field geophysical work used in the search for mineral deposits;
– basic techniques for processing and interpreting the obtained geophysical data;
– basics of oil and gas potential forecasting based on geophysical data;
2) be able to:
– formulate tasks and substantiate the formulation of various types of field geophysical surveys;
– process, analyze and systematize field geophysical information using modern methods of its automated collection, storage and processing;
– to carry out a forecast for the study area using geophysical data;

3) master the skills:

– methods of quantitative and qualitative analysis of geophysical fields;
– skills of critical evaluation of scientific and scientific-technical information.

Drilling of the wells
CODE - PET406
CREDIT - 5 (2/1/0/2)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: is to study the methods of drilling exploration, technical wells and water wells; fundamentals of well drilling technology; possible complications that arise during drilling of wells and affect their operation in the future; possible reserves to improve the quality of wells and reduce their cost.
Course objective: acquisition of knowledge in the development of well construction technology, well design and drilling modes, justification of the drilling fluid used, cementing parameters.

BRIEF DESCRIPTION OF THE COURSE
The discipline "Drilling wells" plays an important role in the formation of specialists who will be engaged in the search and exploration of mineral deposits for oil, gas, fresh and mineral waters, as well as for solid minerals. Knowledge of this discipline makes it possible to correctly determine the physical and mechanical properties of rocks, to choose the most rational rock cutting tools (bits, drill bits) and technical means for sampling cores from wells, to analyze the phenomena occurring in the process of well formation, to predict the performance of bits and drill columns.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
- basic terms and definitions, well design, well classifications;
- history, problems and prospects for the development of well drilling technology;
- technological processes of the production process of well construction;
- methodology for designing well design, calculation of casing strings and plugging to ensure the main technological processes.

2) be able to:
- apply methods of modeling technological processes of drilling wells;
- calculate well designs;
- develop well drilling technology;

3) master the skills:
- methods for constructing the simplest mathematical models of typical professional tasks;
- mathematical methods for solving natural science problems;
- draw up and draw up scientific, technical and service documentation.

Fundamentals of the doctrine of minerals
CODE - GEO594
CREDIT - 5 (2/1/0/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: the study of the geology of mineral deposits, the conditions for the formation of endogenous, exogenous and metamorphogenic deposits.
Course objective:
- study of geological and physico-chemical processes of ore formation and conditions of formation of deposits;
- study of the geological structure of deposits, conditions of occurrence and morphology of ore bodies;
- study of typomorphic features of deposits of different genetic types;
- study of the mineral composition of ores, textures and structures of ores of endogenous, exogenous and metamorphogenic deposits;
- familiarization with typical examples of industrial-genetic types of mineral deposits.

BRIEF DESCRIPTION OF THE COURSE
Study of the geology of mineral deposits; conditions for the formation of endogenous, exogenous and metamorphogenic deposits; geological and physico-chemical processes of ore formation; geological structure of deposits, conditions of occurrence and morphology of ore bodies; mineral composition of ores, textures and structures of ores of endogenous, exogenous and metamorphogenic deposits; industrial-genetic types of mineral deposits and patterns of their placement for geological forecasting and determination of a rational set of methods for prospecting and exploration of deposits.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know: geological, physico-chemical conditions for the formation of various genetic types of mineral deposits, their relationship with certain structural and material complexes of rocks, the mineral composition of ores and classical examples of deposits.
2) be able to: distinguish between genetic groups and classes of mineral deposits according to available geological and other indirect signs.
3) master the skills: to determine the genetic type of mineral deposits from the available samples of ores and host rocks.

Methods of prospecting and exploration of mineral deposits
CODE - GEO595
CREDIT - 5 (2/1/0/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: the formation of students' knowledge in the field of theoretical foundations of prospecting, exploration, testing of various types of minerals, calculating reserves and evaluating deposits at various stages of exploration, as well as acquiring by students the skills of interpreting the data obtained, allowing them to effectively search and explore mineral deposits fossils.
Course objective:
- industrial types of mineral deposits - the main objects of geological exploration;
- the main requirements of the industry for the geological and industrial assessment of mineral deposits;
- stages and stages of geological exploration, tasks and basic requirements for the maintenance of various stages;
- geological foundations of prospecting and exploration of mineral deposits;
- criteria for the potential ore content of the earth's interior, geological prospecting prerequisites and prospecting signs of mineral deposits;
- geological documentation in prospecting and exploration of mineral deposits;
- sampling of minerals, tasks and types of sampling, methods of sampling and methods of testing ores;
- classification of deposit reserves and predicted mineral resources;
- the main methods for calculating the reserves of deposits and assessing the predicted resources of minerals.

BRIEF DESCRIPTION OF THE COURSE
The main tasks of searches; geological prospecting prerequisites and signs of mineral deposits; methods of prospecting for mineral deposits; influence of natural conditions on the choice of search methods; rational integration of search methods. Main tasks and principles of exploration of mineral deposits; staging of exploration works; intelligence systems and density of the exploration network; reconnaissance technical means; geological documentation and sampling; conditions for calculating reserves; calculation of reserves of mineral deposits; classification of deposit reserves and predicted mineral resources.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know: the geological foundations of prospecting and exploration of mineral deposits; the specifics of exploration of various types of mineral deposits; design methods and

production technology of exploration works; features of documentation of exploration workings; know the types and methods of testing mineral raw materials; basic methods for calculating mineral reserves; methods of organization, enterprise management; the state of the mineral resource base of the country and the prospects for its development.
2) be able to: correctly select and justify the methodology for conducting geological exploration in connection with the geological, mining and geographic and economic features of the research object; conduct geological and economic assessment of deposits at various stages of exploration; read graphs, diagrams, maps, diagrams, profile sections, horizontal plans characterizing the geological structure of deposits; carry out the calculation of reserves (resources) and technical and economic analysis of the processes of geological exploration and prospecting.
3) have the skills to: substantiate the methodology for conducting exploration work; to substantiate the density of the exploration network, the choice of a rational sampling methodology, the preparation of initial data for the calculation of reserves and the calculation of reserves by the main methods.

Historical geology
CODE - GEO596
CREDIT - 4 (2/1/0/1)
PRE-REQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: development of students' geological outlook; creation of a basis for further obtaining special knowledge, skills and abilities in the process of studying all subsequent geological disciplines.
The objective of the course: obtaining general ideas about the structure of the Universe, about the patterns of the geological development of the Earth, primarily its outer shells in their interaction.

BRIEF DESCRIPTION OF THE COURSE
The course "Historical Geology" is one of the main disciplines of the geological cycle of higher education. As its name indicates, it examines the history of the development of our Earth, primarily its outer shells in their interaction. Historical geology is a complex, synthetic discipline. It includes four main elements: geochronology, stratigraphy, paleogeography and paleotectonics - in their close, organic connection.
Geochronology is a calendar of geological events, an absolute scale of geological time spanning 4.6 billion years.
Stratigraphy studies the sequence of stratification of sedimentary and volcanic rocks, establishing their relative age and comparing them (correlation) according to the organic remains contained in them.
Paleogeography is engaged in the restoration of the physical and geographical conditions of the geological past - the distribution of land and sea, their heights and depths, as well as climatic zonality, which have experienced significant changes during geological history and even in the modern era.
Paleotectonics studies the history of movements and deformations of the earth's crust, leading to the formation of folded (fold-thrust, fold-cover) mountain structures and the subsequent formation in their place of stable blocks of continental crust - platforms (cratons) and the destruction of this crust with the emergence of new oceanic depressions.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know: the laws of the development of the Earth,
– geological activity of the main factors of its external and internal dynamics,
– patterns of formation of geological bodies; reconstruct the natural conditions that existed on the earth's surface, and the physico-chemical conditions in the bowels of the Earth; reveal the general genetic and chronological patterns of the occurrence and

distribution of minerals in the earth's crust; reveal evolutionary and catastrophic changes in the atmosphere, hydrosphere, lithosphere and biosphere.

2) be able to:

- independently determine the most common minerals and rocks and explain their genesis;
- recognize simple tectonic structures, geological bodies and landforms;

3. own skills:

- Determining the age of rocks;
- Restoration of the physical and geographical conditions of the earth's surface of the geological past;
- Reconstruction of the history of volcanism, plutonism and metamorphism.;
- Restoration of the physical and geographical conditions of the earth's surface of the geological past;
- Reconstruction of the history of tectonic movements.;
- Establishment of laws of development of the earth's crust.

Geology of hydrocarbon compounds
CODE – GEO612
CREDIT - 4 (2/0/1/1)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: a section of geochemistry that studies the prevalence, form of presence, origin, composition and chemical evolution of organic compounds in geological conditions.
Course objective: to study the chemistry of the process of transformation of living matter into fossil forms (including under the action of microorganisms), the study of the conditions and factors that determine the formation of different types of this substance (humus, sapropel, etc.), as well as the mechanisms of further transformation organic matter into rocks under the influence of heat, pressure, seismic, lithological and other geological factors leading to the formation of combustible minerals.

BRIEF DESCRIPTION OF THE COURSE
The content of the course is aimed at studying the sources of hydrocarbons in the subsoil and their role in sedimentary strata, types of high-molecular hydrocarbon compounds inherited from living organisms; biomolecular compounds; the concept of the oil system, the correlation of oils and organic matter residues based on paleobiomarkers; increasing the efficiency of the study of sedimentary basins in order to identify areas promising for oil and gas.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
- the main hypotheses of the organic and inorganic origin of oil, the composition of bioproducers and their role in the formation of the source substance;
2) be able to:
- identify oil and gas complexes, determine the types of migration and their driving forces; processes of transformation of oils in deposits;
3) master the skills:
- use of modern methods for studying the core of oil and gas wells.

Fundamentals of subsoil use
CODE - GEO443
CREDIT - 5 (2/0/1/2)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
Purpose of the course: The purpose of studying the discipline "Fundamentals of subsoil use" is the acquisition by future specialists of the geological profile of knowledge on the issues of rational subsoil use within the framework of the legislation in force in the Republic of Kazakhstan.
Course objective:
- acquisition by students of knowledge of the Laws of the Republic of Kazakhstan: "On Subsoil and Subsoil Use", "On Licensing", "On Oil", etc., as well as Government Decrees regulating subsoil use operations;
- mastering the basic principles of rational subsoil use and familiarization with departmental instructions and reporting of subsoil users;
- acquisition of skills and abilities for the practical application of the acquired knowledge when working in the specialty.

BRIEF DESCRIPTION OF THE COURSE
Legislative framework for subsoil use in Kazakhstan. Ownership of subsoil, minerals and mineral raw materials. Competence of executive bodies in the field of subsoil use. Subsoil use right: types and subjects of law, its origin, provision and transfer. The procedure for granting the right to conduct exploration, production, combined exploration and production. Types, terms of validity, conclusion and execution of the contract. Work program as an integral part of the contract. Protection of mineral resources and the natural environment. Ecological basis for subsoil use operations. Safety of the population and personnel. State Subsoil Fund. Rights and obligations of a subsoil user. Ownership of information about the subsoil. Peculiarities of legal relations during operations for the exploration and production of oil, groundwater, precious metals and precious stones and other minerals. Taxation of subsoil users

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know: the main goals, objectives and principles of subsoil use in the Republic of Kazakhstan. Know all types of subsoil use operations, sources of their financing, as well as the system of taxation of subsoil users. To know the content of the state subsoil fund of the Republic of Kazakhstan.
2) be able to: draw up the necessary documents for obtaining the right to subsoil use and the draft Subsoil Use Contract.
3) have the skills to: monitor the operation of subsoil use.

Hydrogeology and fundamentals of engineering geology
CODE –GEO599
CREDIT - 4 (2/1/0/1)
PREREQUISITE -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course: to familiarize students with fundamental and applied problems of hydrogeology, issues of theory, methodology and practice of hydrogeological research in the search and exploration of deposits of solid minerals, oil and gas. The acquisition of theoretical knowledge about the engineering-geological features and properties of rocks, the geological and engineering-geological processes occurring in these rocks, the engineering-geological conditions of various territories, the study of which is necessary in order to predict their changes during economic development.
Course objective: - study of the conditions of occurrence, movement and formation of natural waters in the lithosphere; study of the theoretical foundations of hydrogeology; study of hydrogeological aspects of environmental protection.

BRIEF DESCRIPTION OF THE COURSE
Components of hydrogeology; physical properties and chemical composition of groundwater; methods of processing chemical analyzes of natural waters and forms of their display; types of movement of waters and brines in the earth's crust; aqueous solutions in the lithosphere; hydrogeological basins and geohydrodynamic systems; useful waters in the bowels; hydrogeological surveys and research; paleohydrogeology; hydrogeological conditions of migration, accumulation, ecological hydrogeology.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, students must
1) know:
- characteristics of groundwater, their properties and relationships with each other,
- communication with the atmosphere and underground hydrosphere,
- the field of nutrition and their distribution;
- purpose of their application.
2) be able to:
- conduct searches, exploration and evaluation of operational groundwater reserves for the purpose of water supply of settlements, agricultural and industrial enterprises;
3) master the skills:
providing a scientific basis for long-term planning of geological exploration, hydrogeological and other works.

Defense of the thesis/thesis project
CODE - ECA103
CREDIT - 6

The purpose of the thesis (project) is:
1) systematization, consolidation and expansion of theoretical knowledge and practical skills in the specialty and their application in solving specific scientific, technical, economic and industrial problems, as well as cultural purposes;
2) development of skills for conducting independent work and mastering the methodology of scientific research and experimentation in solving the developed problems and issues;
3) finding out the student's preparedness for independent work in the conditions of modern production, science, technology, culture, as well as the level of his professional competence.

SHORT DESCRIPTION
The procedure for defending a thesis (project) is determined by the Rules for conducting ongoing monitoring of academic performance, intermediate and final state certification of students in educational institutions, approved by orders of the Ministry of Education and Science of the Republic of Kazakhstan. The thesis (project) is defended at an open meeting of the state attestation commission with the participation of at least half of its members. The defense of the thesis (project) is organized in a public form, with the presence of students, teachers of the graduating department. The supervisor, representatives of the organization on the basis of which the thesis research was conducted and other interested persons can also be invited to the defense. The duration of the defense of one thesis, as a rule, should not exceed 30 minutes per student. To defend the thesis, the student makes a presentation to the state attestation commission and those present for no more than 15 minutes. All those present in the form of questions or speeches can take part in the discussion of the thesis (project). After the discussion, the secretary of the commission reads out a review (if present, the supervisor can speak in person) and a review. If there are comments in the review and / or review, the student must give a reasoned explanation of their essence. Based on the results of defending the thesis (project), an assessment is made according to the point-rating letter system. This takes into account the level of theoretical, scientific and practical training, the review of the supervisor and the assessment of the reviewer.