NJSC «Kazakh national research technical university after K.I.Satbayev»
K. Turysov Institute of Geology, Oil and Mining
«Geological Survey, Prospecting and Exploration of Mineral Deposits» Department

EDUCATIONAL PROGRAM

«GEOLOGY AND EXPLORATION OF SOLID MINERAL DEPOSITS»
(profile direction (1.5 years)

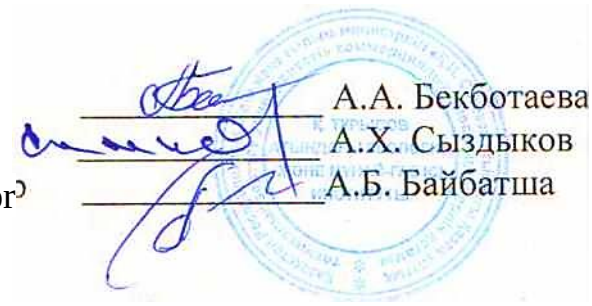
Master of Engineering Science in the educational program "7M07218 Geology and Exploration of Solid Mineral Deposits"

1st edition
in accordance with the State Educational Standards of Higher Education in 2018

Almaty 2021

The program is drawn up and signed by the parties:

From KazNRTU after K.Satpaev:
1. Head of GSPaEMD department А.А. Бекботаева
2. Director of K.Turysov IGOaM А.Х. Сыздыков
3. Chairman of department's UMG, professor А.Б. Байбатша



From employers:
1. Chief Researcher of the Institute of Geological Sciences named after KI Satpayev, Candidate of Geological and Mineralogical Sciences Zhunusov AA
2. Director of LLP "ECC" GEO ", full member of PONEN - BM Kabaziev
3. Head of the geological prospecting site Pustynnoe JSC "AK Altynalmas", candidate of geological and mineralogical sciences Rassadkin V.V.

From partner university:
Professor of the Department of Geology of the Engineering School of Natural Resources of the Tomsk Polytechnic University, Doctor of Geological and Mineralogical Sciences Yazikov E.G.

*Approved at a meeting of the Academic Council of the Kazakh National Research Technical University named after K.I. Satpayev. Minutes No. 3 dated June 25, 2021

Qualification:
Level 7 National framework of qualifications:
7M07 Engineering, manufacturing and construction industries
7M072 Manufacturing and processing industries (master):
Geology and exploration of solid mineral deposits

Professional competence: Management of the geological industry, organization, conduct and control of exploration work at all phases and stages of geological research, be competent in matters of geology and exploration of the subsoil, the state and prospects of development of the industry, the legal framework for subsoil use, as well requirements for the quality of mineral raw materials and the conditions of the world, regional and local markets; expert in research work in the field of prospecting, exploration, exploitation of solid mineral deposits; teaching skills for work at universities and colleges.

Short description of the program:

Designed for the implementation of profile training of masters in the educational program «Geology and exploration of solid mineral deposits» at Satbayev University and developed as part of direction «Manufacturing and processing industries».

1. *The purpose of the master's education program «Geology and exploration of solid mineral deposits»* is training, taking into account the country's development prospects, competitive highly qualified personnel with high spiritual and moral qualities, capable of independent thinking and ensuring the progressive scientific, technical, social-economic and cultural development of society.

At the master's level, training in the specialty «Geology and exploration of solid mineral deposits» is carried out along trajectories involving the implementation of educational programs for the training of personnel in the geological sector, which have in-depth technical, analytical, scientific, pedagogical and prognostic training.

2 Types of work:

- scientific and production;
- project;
- organizational and management;
- scientific and pedagogical.

Master on specialty «Geology and exploration of solid mineral deposits» is depending on the type of professional activity prepared for the following professional tasks:

a. scientific and production activity:

– independent preparation and conduct of industrial and scientific-industrial field, laboratory and interpretation studies in solving practical problems (in accordance with the orientation (profile) of the master's program);

– independent selection, training and professional operation of modern field and laboratory equipment and instruments (in accordance with the focus (profile) of the master's program);

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

– complex processing and interpretation of field and laboratory information in order to solve scientific and production problems;

– determination of the economic efficiency of scientific and production work;

b. project activity:

– design and implementation of scientific and technical projects;

– participate in the examination of projects of scientific and research and scientific and production activities;

– participation in the development of normative methodological documents in the field of geological work;

c. organizational and management activity:

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

– planning and organization of scientific and scientific and production seminars and conferences;

3 Objects of professional activity of the graduate:

– earth, earth crust, lithosphere, rocks, solid mineral deposits;

– physical properties of rocks;

– minerals, crystals, geochemical fields and processes;

– geological environment, natural and technogenic geological processes; ecological functions of lithosphere.

PASSPORT OF EDUCATIONAL PROGRAM

1 Program volume and content

The term of study in a magistracy is determined by the amount of assimilated academic credits. When mastering the established amount of academic loans and achieving the expected learning outcomes for obtaining a master's degree, the educational master's program is considered fully mastered. In profile magistracy there are at least 92 academic credits for the entire period of study 1.5 year, including all types of educational and scientific activities of a graduate student.

The planning of the content of education, the method of organizing and conducting the educational process is carried out by the university and a scientific organization independently based on credit training technology.

The master's degree in the profile direction implements educational programs of postgraduate education for the training of management personnel with in-depth professional training.

The content of the master's educational program consists of:

1) theoretical training, including the study of cycles of basic and major disciplines;

2) practical training of undergraduates: various types of practices, scientific or professional internships;

3) experimental research work, including the implementation of a master's project - for a specialized master's program;

4) final certification.

Content of «Geology and exploration of solid mineral deposits» EP based on the development of a multi-level training system, the fundamentality and quality of education, the continuity and succession of education and science, the unity of training, education, research and innovation activity, aimed at maximizing customer satisfaction should ensure:

- obtaining a full and high-quality professional and scientific-pedagogical education in the field of geology of solid mineral deposits (MD), confirmed by the level of knowledge and skills, competencies, their assessment, both in content and volume
- providing training for masters for the geological industry who know the technology, organization and economics of the geological industry, methods and principles for its improvement and design.
- training of professional and competitive specialists in the field of geology, prospecting and exploration of mineral deposits;
- professional and competitive training - a high level of theoretical training in the field of social-cultural, economic, legal and professional disciplines, taking into account the trends of modern scientific, pedagogical and professional social development, the inclusion of leading domestic and foreign experts in the field of services in geology;
- – development of skills of design and research activities, implementation of projects aimed at the practical application of modern professional digital techniques and

technologies for organizing the activities of geological production enterprises, research and educational organizations;

– optimal balance in the educational process of theoretical and practical training (due to the purposeful organization of research and production practices);

– a personal-oriented approach to the educational process, focused on developing a responsible attitude to the results of their professional activities;

– the aspect of self-development, where the emphasis is on the organization of professional activities, in which the master's student is focused on continuous professional self-improvement.

Objectives of the educational program:

– Readiness of specialists for project work in the field of prospecting, exploration, and exploitation of solid mineral deposits.

– Readiness of specialists for production and technological activities that ensure the introduction and operation of new geological technologies at the local level.

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

– Readiness of specialists for informational, ideological and problematic communications in the professional environment and in the audience of non-specialists with a clear and deep justification of their position, to engage in organizational, managerial and service activities, to be aware of the responsibility for making their professional decisions.

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

2 Requirements for applicants

The previous level of education of applicants is higher professional education (bachelor's degree). The applicant must have a diploma of the established sample and confirm the level of knowledge of the English language with a certificate or diplomas of the established sample.

The procedure for admission of citizens to the master's program is established in accordance with the "Standard rules for admission to training in educational organizations that implement educational programs of postgraduate education».

The formation of a contingent of undergraduates is carried out by placing a state educational order for the training of scientific and pedagogical personnel, as well as paying for training at the expense of citizens ' own funds and other sources. The state provides citizens of the Republic of Kazakhstan with the right to receive free postgraduate education on a competitive basis in accordance with the state educational order, if they receive this level of education for the first time.

At the" entrance", the master's student must have all the prerequisites necessary for the development of the corresponding educational program of the master's degree. The

list of necessary prerequisites is determined by the higher education institution independently.

In the absence of the necessary prerequisites the master student is allowed to master them on a paid basis.

3 Requirements for completing training and obtaining a diploma

Degree/ qualifications awarded: The graduate of this educational program is awarded the academic degree "Master of Engineering and Technology" in the direction of "Manufacturing and Processing Industries" with a degree in "Geology and Exploration of Solid Mineral Deposits".

A graduate who has mastered master's programs must have the following general professional competencies:

- the ability to independently acquire, comprehend, structure and use new knowledge and skills in professional activities, develop their innovative abilities;
- the ability to independently formulate research goals, establish a sequence for solving professional problems;
- the ability to apply in practice knowledge of fundamental and applied disciplines that determine the focus (profile) of the master's program;
- the ability to professionally choose and creatively use modern scientific and technical equipment for solving scientific and practical problems;
- the ability to critically analyze, represent, defend, discuss and disseminate the results of their professional activities;
- possession of the skills of compiling and preparing scientific and technical documentation, scientific reports, reviews, reports and articles;
- willingness to lead a team in the field of their professional activities, tolerantly perceiving social, ethnic, confessional and cultural differences;
- readiness to communicate in oral and written forms in a foreign language to solve problems of professional activity.

A graduate who has completed the master's program must have professional competencies that correspond to the types of professional activities that the master's program focuses on:

production activities:

– the ability to independently conduct production field, laboratory and interpretative work in solving practical problems;

– the ability to professionally operate modern field and laboratory equipment and devices in the field of master's degree program;

– ability to use modern methods of processing and interpreting complex information to solve production tasks;

project activity:

– ability to independently prepare and submit research and production projects;

– willingness to design interdisciplinary scientific research and scientific-production work in solving professional problems;

organizational and managerial activities:

– readiness to use practical skills in organizing and managing research and production activities in solving professional tasks;

– readiness for practical use of normative documents in the planning and organization of scientific and production works;

When developing a master's program, all General cultural and professional competencies, as well as professional competencies related to the types of professional activities that the master's program focuses on, are included in the set of required results of the master's program.

4 Working curriculum of the educational program

4.1. Training period 1,5 years

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

SATBAYEV UNIVERSITY

APPROVED
Chairman of the Board -
Rector of the KazNRTU after K.Satbayev
M. M. Begentayev
"28" 06 2021

WORKING CURRICULUM
of the educational program for 2021-2022 academic year admission
Educational program 7M07218 - "Geology and exploration of solid mineral deposits"
Group of Educational programs M121 - "Geology"

Full-time study | Study duration: 1,5 years | Academic degree: master of engineering and technologys

year of study	Code	Name of course	Component	Academic credits	Total hours	audience volume, lec/ lab/ pr	SIW (including SIWT) in hours	Prerequisites	Code	Name of course	Component	Academic credits	Total hours	audience volume, lec/ lab/ pr	SIW (including SIWT) in hours	Prerequisites
	1 semester								2 semester							
1	LNG211	Foreign language (professional)	BD IC	5	150	0/0/3	105		GEO223	Methods of lithological research	PD OC	5	150	2/0/1	105	
	MNG725	Management	BD IC	3	90	1/0/1	60		GEO212	Geochemistry of radioactive elements			150	2/0/1	105	
	HUM208	Management Psychology	BD IC	3	90	1/0/1	60		GEO220	Metallogeny and ore formations of Kazakhstan	PD OC	5	150	2/0/1	105	
	GEO209	Geological modeling of mineral deposits	BD OC	5	150	2/0/1	105		GEO208	The geological structure of ore fields and deposits			150	2/0/1	105	
	GEO485	Genesis of the main industrial deposits			150	2/0/1	105		GEO231	Basics of petrology	PD OC	5	150	2/0/1	105	
	GEO218	Mineral deposits of Kazakhstan			150	2/0/1	105		GEO306	Petrochemistry			150	2/0/1	105	
	GEO246	Ecological geology	PD OC	5	150	2/0/1	105		GEO240	Regional geology of the UIC			150	2/0/1	105	
	GEO283	Actual problems of stratigraphy			150	2/0/1	105		GEO214	Advanced well logging	PD OC	5	150	2/0/1	105	
	GEO709	Geotectonics with geodynamics basics	PD OC	5	150	2/0/1	105		GEO211	GIS uranium deposits			150	2/0/1	105	
	GEO227	Mineralogy of radioactive and rare earth elements			150	2/0/1	105		GEO483	Actual problems of modern subsurface	PD OC	5	150	2/0/1	105	
	GEO714	Geology of uranium deposits			150	2/0/1	105		GEO210	Geological support of subsoil use			150	2/0/1	105	
									GEO212	Geochemistry of radioactive elements			150	2/0/1	105	
									AAP221	Master's student experimental research work, including internship and master's project implementation	MSERW	4				
		In total		26						In total		29				
	3 semester															
2	AAP246	Work placement	PD OC	10												
	AAP220	Master's student experimental research work, including internship and master's project implementation	MSERW	14												
	ECA206	Registration and defense of the master's thesis	FA	12												
		In total		36												

Decision of the Academic Board of KazNRTU after K.Satbayev. Protocol No. 3 of "25" 06 2021

Decision of the Academic Board of the Institute GPMI. Protocol No. 5 of "24" 12 2020.

Vice-Rector for Academic Affairs — B. Zhautikov

Director of the Institute — A. Syzdykov

Head of the Department — A. Bekbotayeva

Number of credits for the whole period of study	
Cycles of disciplines	**Credits**
The cycle of general education	0
A cycle of basic disciplines (BD IC, BD OC)	21
A cycle of profile disciplines (PD IC, PS OC)	40
All on the theoretical classes:	**61**
MSERW	18
Registration and defense of the master's thesis	12
In total	**91**

5 Descriptors of the level and volume of knowledge, skills, competencies

Requirements for the level of training of a graduate student are determined on the basis of Dublin descriptors of the second level of higher education (master's program) and reflect the mastered competencies expressed in the achieved learning outcomes.

Learning outcomes are formulated both at the level of the entire educational program of the magistracy, and at the level of individual modules or academic discipline.

Descriptors reflect learning outcomes that characterize the learner's abilities:

1) to demonstrate developing knowledge and understanding in the studied field of geology and exploration of solid mineral deposits, based on advanced knowledge of this field, in the development and (or) application of ideas in the context of research;

2) apply at a professional level their knowledge, understanding and ability to solve problems in a new environment, in a wider interdisciplinary context;

3) collect and interpret information to form judgments taking into account social, ethical and scientific considerations;

4) clearly and unambiguously communicate information, ideas, conclusions, problems and solutions to both specialists and non-specialists;

5) training skills necessary for independent continuation of further training in the studied field of geology and exploration of solid mineral deposits.

6 Competencies to complete the training

6.1 Requirements for the key competencies of graduates of scientific and pedagogical magistracy, should:

1) have an idea:

- on the role of science and education in public life;
- about modern trends in the development of scientific knowledge;
- on topical methodological and philosophical problems of the natural (social, humanitarian, economic) sciences;
- on the professional competence of a teacher of higher education;
- about the contradictions and socio-economic consequences of globalization processes;

2) know:

- methodology of scientific knowledge;
- principles and structure of the organization of scientific activity;
- Psychology of cognitive activity of students in the learning process;
- psychological methods and means of increasing the effectiveness and quality of training;

3) be able to:

- use the knowledge gained for the original development and application of ideas in the context of scientific research;
- critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena;

- integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions;
- through the integration of knowledge, make judgments and make decisions based on incomplete or limited information;
- apply the knowledge of pedagogy and psychology of higher education in their teaching activities;
- apply interactive teaching methods;
- to carry out information-analytical and information-bibliographic work with the involvement of modern information technologies;
- think creatively and be creative in solving new problems and situations;
- Fluent in a foreign language at a professional level, allowing for research and teaching of special disciplines in universities;
- summarize the results of research and analytical work in the form of a dissertation, scientific article, report, analytical note, etc .;

4) have skills:

- research activities, solutions to standard scientific problems;
- the implementation of educational and pedagogical activities on credit training technology;
- methods of teaching professional disciplines;
- the use of modern information technologies in the educational process;
- professional communication and intercultural communication;
- oratory, the correct and logical design of their thoughts in oral and written form;
- expanding and deepening the knowledge necessary for everyday professional activity and continuing education in doctoral studies.

5) be competent:

- in the field of research methodology;
- in the field of scientific and scientific-pedagogical activity in higher educational institutions;
- in matters of modern educational technologies;
- in the implementation of scientific projects and research in the professional field;
- in ways to ensure constant updating of knowledge, expansion of professional skills.

Competencies acquired by students in the development of the educational program "Geology and exploration of solid mineral deposits"

Core competencies (B)	
B1	Ability to abstract thinking, analysis, synthesis; willingness to act in non-standard situations, bear social and ethical responsibility for decisions made; readiness for self-development, self-realization, use of creative potential; the ability to use in-depth knowledge of legal and ethical standards in assessing the consequences of their professional activities, developing and implementing socially significant projects and using in practice the skills and abilities in organizing research and development, in managing a research team
B2	To possess knowledge of the philosophical concepts of natural science and the foundations of the methodology of scientific knowledge in the study of various levels of organization of matter, space and time; ability to active social mobility; willingness to lead a team in the field of their professional activity, tolerantly perceiving social, ethnic, religious and cultural differences
B3	The ability to apply modern computer technology in the collection, storage, processing, analysis and transmission of geographical information and for solving research and production and technological problems of professional activity; own methods for assessing the representativeness of the material, the volume of samples during quantitative research, statistical methods for comparing the data obtained and determining patterns
B4	The ability to freely use the state language and a foreign language as a means of business communication; ability to actively communicate in the scientific, industrial and socio-social spheres of activity; readiness for independent research work and work in a scientific team, the ability to generate new ideas (creativity)
Professional Competencies (PC)	
PC1	The ability to formulate problems, tasks and methods of scientific research, obtain new reliable facts based on observations, experiments, scientific analysis of empirical data, abstract scientific papers, compile analytical reviews of accumulated information in world science and industrial activity, summarize the results in the context of previously accumulated in science knowledge and formulate conclusions and practical recommendations based on representative and original research results
PC2	The ability to creatively use in scientific and industrial-technological activities the knowledge of fundamental and applied sections of special disciplines of the master's program. The ability to use modern methods of processing and interpretation of geological information when conducting scientific and industrial research
PC3	Own the basics of design, expert analysis and research using modern approaches, methods, equipment and computing systems. Ability to develop exploration projects, exploration, exploration, assessment and organization of such activities
PC4	They will understand the features of metallogeny, mineralogy, industrial types of deposits in the regions of Kazakhstan. They will be able to analyze the structural diagram of various age-related formations; compile a metallogenic map according to the type of mineral; analyze metallogenic maps. They will know about the laws of formation and crystallization of magmatic melts, modern classification and nomenclature, chemical and mineral composition, structure and genesis of the main types and varieties of magmatites.
PC5	They will understand modern methods and materials of remote sensing of the Earth and photogrammetry; physical fundamentals of Earth remote sensing; technology and image enhancement methods. They will be able to select and use remote sensing data in combination with other source data to solve various applied problems; perform processing of aerospace images using special software; to choose and justify the necessary resolution of images correctly; apply various ways to improve the image and extract the necessary information

	from it during geological mapping and prospecting; to generalize and analyze the information received; own basic methods, methods and means of obtaining, storing, processing information; work with spatial data in geographic information systems
PC6	They will understand and know the regional structures of the earth's crust of the studied territory in four positions: the principle of tectonic zoning of regional structures; the boundaries of each considered structure; know the features of the geological structure of the structure in the aspect of its stratigraphy and tectonics (development history); highlight the mineral structure. Learn to analyze the tectonic map and the map of tectonic zoning. They will be able to independently analyze, compare the geological data of one territory with another, reproduce the history of the geological development of the region and highlight the structure and types of mineral deposits associated with them.

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Matrix of competencies of the educational program "Geology and exploration of mineral deposits"

Discipline index	Name disciplines	Basic				Professional					
		B1	B2	B3	B4	PC1	PC2	PC3	PC4	PC5	PC6
Mandatory component											
LNG211	English language (professional)		x		x						
MNG725	Management	x	x	x							
HUM204	Psychology of management		x					x			
Elective courses											
GEO209	Geological modeling of MD	x		x		x	x			x	x
GEO218	Mineral deposits of Kazakhstan	x		x		x	x			x	x
GEO220	Metallogeny and ore formations of Kazakhstan	x				x	x		x		
GEO208	Geological structures of ore fields and deposits	x				x	x		x		
GEO214	Well Logging (Advanced)					x	x				x
GPH211	GIS of uranium deposits			**x**		**x**	**x**	**x**		**x**	
GEO207	Genesis of the main industrial deposits					x	x		x		x
GEO283	Actual problems of stratigraphy		**x**				**x**			**x**	
GEO203	Actual problems of modern subsoil use	x			x	x	x	x		x	
GEO210	Geological support of subsoil use		**x**			**x**	**x**	**x**			
GEO231	Fundamentals of Petrology			x		x	x		x		x
GEO306	Petrochemistry	**x**				**x**			**x**		
GEO240	Regional geology of the CIS countries					x	x	x			x
GEO709	Geotectonics with the basics of geodynamics			x			x	x		x	
GEO223	Lithological research methods	x	x	x			x	x	x		
GEO212	Geochemistry of radioactive elements	**x**				**x**			**x**		
GEO246	Environmental geology	x	x	x			x			x	
GEO714	Geology of uranium deposits	**x**				**x**			**x**		
GEO227	Mineralogy of radioactive and rare earth elements	**x**				**x**			**x**		
State final certification											
ECA206	Registration and defense of a master's thesis	x	x	x	x	x	x	x	x	x	x
Additional types of training											
AAP220-221	Experimental research work of a master student	x	x	x	x	x	x	x	x	x	x
AAP246	Internship	x	x	x	x	x	x	x	x	x	x

6.2 Requirements for the experimental research work of a master student in a specialized master's program:

1) corresponds to the profile of the educational program of the magistracy, according to which the master's thesis is implemented and defended;

2) relevant and contains scientific novelty and practical significance;

3) is based on modern theoretical, methodological and technological achievements of science and practice;

4) is performed using modern methods of scientific research;

5) contains research (methodological, practical) sections on the main protected provisions;

6) based on international best practices in the relevant field of knowledge.

6.3 Requirements for the organization of practices:

The educational program of profile magistracy includes two types of practices that are conducted in parallel with theoretical training or in a separate period:

1) industrial in the database cycle - at the university;

2) experimental-research in the PD cycle - at the place of the dissertation.

Industrial practice is carried out with the aim of developing practical skills in the professional field.

The experimental research practice of the undergraduate is carried out with the aim of acquainting with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data

7 ECTS Diploma Supplement

The application is developed according to the standards of the European Commission, Council of Europe and UNESCO / CEPES. This document is for academic recognition only and is not an official confirmation of an educational certificate. Without a diploma of higher education is not valid. The purpose of filling out the European Annex is to provide sufficient information about the holder of the diploma, the qualifications 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 about the national education system. In the application model, which will be used to transfer estimates, the European system of transfers or credit transfer (ECTS) is used.

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

English language (professional)
CODE - LNG211
CREDIT - 5 (0/0/3/2)
Prerequisite –Academic English, Business English, IELTS 5.0-5.5

GOAL AND OBJECTIVES OF THE COURSE
The goal of the course is to develop students' knowledge of the English language for their ongoing academic research and to increase the effectiveness of their work in the field of project management.

SHORT DESCRIPTION OF THE COURSE
The course aims to create vocabulary and grammar for effective communication in the field of project management and to improve reading, writing, listening and speaking skills at the Intermediate level. Students are expected to acquire replenishment of their vocabulary of business English and learn grammatical structures that are often used in the context of management. The course consists of 6 modules. The 3rd module of the course ends with an intermediate test, and the 6th module is followed by a test at the end of the course. The course ends with a final exam. Undergraduates also need to study on their own (MIS). MIS - independent work of undergraduates under the guidance of a teacher.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE
Upon successful completion of the course, students are expected to be able to recognize the main idea and the main message, as well as specific details when listening to monologues, dialogues and group discussions in the context of business and management; understand written and spoken language in English on topics related to management; write management texts (reports, letters, emails, minutes of meetings), following the generally accepted structure with a higher degree of grammatical accuracy and using business words and phrases, talk about different business situations using the appropriate business vocabulary and grammatical structures - in pairs and groups discussions, meetings and negotiations.

Management
CODE – MNG725
CREDIT - 3 (1/0/1/1)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The aim of teaching the discipline "Management" is to master the methodology of project management in various fields of activity, to foster a culture adequate to modern project management and information technology, to create conditions for the introduction of new information technologies in the implementation of projects. The course is based on international guidelines for project management (Project Management Body of Knowledge).

SHORT DESCRIPTION OF THE COURSE
The content of the discipline is aimed at studying modern concepts, methods, project management tools in order to apply them in further practical activities of a specialist to solve problems of planning and executing projects.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know:
modern standards in the field of project management and their characteristics; PMI approach to project management; planning of investment activities; accounting for project risks; methods of optimizing the use of available resources; ways of resolving conflict situations; analysis of actual indicators for timely adjustment of the progress of work.
Be able to:
prepare documents for the initialization phase of the project, such as feasibility studies, project charter, develop and analyze documents related to the planning of project activities, apply various methods of decision support; promptly monitor the execution of work and track deadlines; select personnel, resolve contradictions between team members; manage risks arising from project implementation.
Have skills:
project management in accordance with modern project management requirements - apply in the project management process using MS Project software

Psychology of management
CODE - HUM208
CREDIT - 3 (1/0/1/1)
PRE-REQUISIT - no

PURPOSE AND OBJECTIVES OF THE COURSE
teaching undergraduates the basics of higher school psychology, expanding their professional capabilities in terms of the application of psychological knowledge in the field of pedagogical activity.

BRIEF DESCRIPTION OF THE COURSE
Psychological education at the university. The psychological structure of the learning process, the psychology of cognitive activity, psychological methods and means of increasing the efficiency and quality of education in modern conditions, the psychology of the individual and the student body, the upbringing and formation of professional self-awareness, psychodiagnostics in higher education, the psychological characteristics of the pedagogical activity of a higher school teacher, a student as a subject educational activities, psychological and pedagogical communication, the psychology of pedagogical influence, the main psychological problems in pedagogical activity.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
At the end of the course, the undergraduate must master basic knowledge, skills and abilities about the socio-psychological nature of pedagogical activity, about the properties of mental and cognitive processes included in cognitive activity, about the content and specifics of psychological and pedagogical influence, about the individual characteristics of objects of influence of skills, be able to use the necessary psychological and methodological resources for the preparation and conduct of classes (lectures, seminars, SRSP and exams); be able to apply adequate psychodiagnostic methods for studying the personality of a student and student group; manage the learning process, in various aspects of communication in the field of professional activity, professional reflection, mastery of the main methods of psychological influence.

Geological modeling of mineral resources
CODE - GEO209
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of studying this discipline is to acquire knowledge, skills and abilities to work with software for three-dimensional geological modeling and assessment of mineral reserves. To give theoretical and practical knowledge in the field of computer modeling of deposits: in relation to the problems of geology. Deepening technological education in the field of computer technology.

BRIEF DESCRIPTION OF THE COURSE
Introduction. The emergence of the need for computer programs for visualization and interpretation of various geological exploration data in a 3D environment. 3D modeling of mineral deposits. Working with graphic applications. Field modeling and reserves estimation using Micromine software.
KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: methods and basic principles of geological modeling of mineral deposits in relation to problems solved in geology;
Be able to: based on primary geological materials, interpret and create wireframe, block models of ore bodies; build digital surface models (DMP); visualize interpreted geological, geochemical, etc.
Have skills: apply GIS technologies to solve geological and appraisal works mineral; estimate ore reserves using various methods of the Micromine program.

Ecological geology
CODE – GEO246
CREDIT – 5 (2/0/1/2)
PREREQUISITES: GEO 115 General geology

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of the course is to solve morphological problems related to the study of the composition, state, structure and properties of the analyzed system, its ecological and geological conditions as a whole. Retrospective tasks related to the study (or rather restoration) of the history of the formation of the object of research, the formation of its modern quality. Forecast tasks related to the study of the structure and development trends of the system under study in the future under the influence of various causes of natural and man-made origin.

BRIEF DESCRIPTION OF THE COURSE
Familiarization with the ecological functions of the lithosphere and the whole complex of environmental problems. Morphological, retrospective, and predictive tasks are solved. Theoretical basis of ecological Geology. Criteria for assessing the current state of ecosystems. Ecological, resource, ecological, geodynamic, geochemical functions of the lithosphere.

KNOWLEDGE, SKILLS AT THE END OF THE COURSE
Know: basic concepts, object, subject and tasks of ecological geology, the ratio of ecological geology and geoecology, ecological functions of the lithosphere, types of lithological systems and their ecological functions, criteria for assessing the current state of ecosystems, methodological foundations of ecological geology, the system of ecological and geological monitoring and methods of ecological and geological mapping, the content of engineering and environmental surveys, the role of environmental geology in the justification of environmental management.
Be able to: analyze the structure, historical development of ecological and geological systems, perform forecast constructions;
Have the following skills: building ecological and geological maps, organizing and conducting ecological and geological monitoring, and conducting engineering and environmental surveys.

Geotectonics with the basics of geodynamics
CODE - GEO709
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
Determination of the causes, features of manifestation, direction of action of tectonic movements in the section of the upper solid shells of the Earth - in the earth's crust and lithospheric mantle, as well as identifying the time and sequence of formation, development and stabilization of tectonic structures of the earth's crust of various ranks (structural elements of the earth's crust), formed as a result of tectonic stresses and in various tectonic regimes.

SHORT DESCRIPTION OF THE COURSE
Geotectonic hypotheses. "The doctrine of geosynclines" as the first paradigm of geological science. Types of tectonic movements. Modern tectonic movements, methods of their study. Geological formations and their deformation. Fixism and mobilism, their differences. Geological and geomorphological features of the oceans. Geological structures of the transition zone from oceans to continents. Fold belts of continents (young platforms). The ancient platforms of the continents are cratons. Areas of continental orogenesis. Principles of tectonic zoning and tectonic maps. The main stages of development of the Earth (AR-PR2). The main stages of the Earth's development (PR3-KZ).

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
The main types of the earth's crust, the general patterns of evolution of global and large tectonic structures of the earth's crust, the main modern views on the nature and features of the manifestation of tectonic processes, the main provisions of the geotectonic concept of "Plate tectonics (TLP)", which is the main paradigm of modern geological science, and also be able to read tectonic maps and sections and display geological structures of various ranks on such maps.

Metallogeny and ore formations of Kazakhstan
CODE - GEO220
CREDIT - 5 (2/0/1/2)
Prerequisite: no

GOAL AND OBJECTIVES OF THE COURSE
The aim of the course is to study the basic principles of general metallogeny and familiarize with the content of regional, historical, special metallogeny for the development of the geological foundations of the mining business, as fundamental principles for the development of the mineral industry.
The main tasks of studying the discipline are to master the terminology and conceptual framework of metallogenic science and the doctrine of ore formations, the principles of metallogenic and ore-formation analysis; get acquainted with the most important types of ore formations and metallogeny elements of the oceans, platforms and folded systems from the point of view of tectonics of lithospheric plates; have an idea of the metallogenic zoning of the world, the CIS and Kazakhstan

SHORT DESCRIPTION OF THE COURSE
The concept of metallogeny and mineralogy. Total metallogeny. The concept of ore-forming processes and systems. The concept of ore formation analysis. Geological, ore, metasomatic and metallogenic formations. General principles of metallogenic research. Metallogeny of modern seas and oceans, folded-geosynclinal belts. The basics of metallogeny from the standpoint of modern geodynamics. Metallogeny of rift environments, subduction-orogenic environments, noble metals, non-metallic, ferrous, non-ferrous, radioactive, rare metals of Kazakhstan.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE
To know: features of metallogeny and mineralogeny in the regions of Kazakhstan.
To be able to: conduct an analysis of the structural diagram of various age-related formations; compile a metallogenic map according to the type of mineral; analyze metallogenic maps.
To have skills: a comparison of typical ore and geological formations in Kazakhstan compilation and analysis of geological and genetic models of typical ore formations in Kazakhstan: iron ore, gold ore, copper ore.

Basics of Petrology
CODE - GEO231
CREDIT - 5 (2/1/0/2)
Prerequisite: GEO122 Petrography

GOAL AND OBJECTIVES OF THE COURSE
B ost endogenous deposits are closely associated with igneous rocks, and they themselves are often the minerals. Therefore, for undergraduates in the specialty "Geology and Exploration of the MPI", the main purpose of studying this discipline is to obtain knowledge about the composition, structure, conditions of formation of magmatites and the relationship of mineral deposits with them.

SHORT DESCRIPTION OF THE COURSE
Current data on magmas and their origin: physicochemical principles of crystallization of magmatic melts; the main causes of the diversity of magmatites; chemical and mineral composition, structures of magmatites and their genetic significance; rocks of ultramafic, basic middle, acid, foid composition and their types, varieties, conditions for the formation and connection with it of mineral deposits; their study using a polarizing microscope; igneous associations (formations) and series.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE
Know : about the laws of formation and crystallization of magmatic melts, modern classification and nomenclature, chemical and mineral composition, structure and genesis of the main types and varieties of magmatites .
To be able to: analyze the chemical composition of rock-forming minerals, restore the conditions for the formation of igneous rocks, make an assumption about the thermodynamic, chemical and physical conditions of crystallization of rocks.
Have skills: researching rock-forming minerals with a polarizing microscope .

Well logging (advanced)
CODE - GEO214
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of the course is an in-depth study of the physical foundations of methods widely used for well survey, as well as methods and ways of interpreting well logging data and modern software.
The objectives of the course are to give advanced concepts about geological objects of study, exposed by deep wells, and the spectrum of physical fields used to study rocks in the section of wells, carrying information about the geological section and its petrophysical properties.

SHORT DESCRIPTION OF THE COURSE
The physical nature and field of application of electric, electromagnetic, radioactive, acoustic, thermal, hydrodynamic and geological-technological methods of wells are described.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: the physical foundations of GIS methods; methods and ways of interpreting well log data.
Be able to: carry out standard processing and interpretation of GIS data; to obtain estimates of reservoir characteristics of reservoirs based on the interpretation of the well logging complex; use modern software tools for GIS interpretation; formalize the results of their research activities in the form of a scientific report.
Have skills: work in the package for processing and interpretation of well logging data Geooffice Solver, work in the package for processing and interpretation of well log data.

Actual problems of modern subsoil use
CODE - GEO203
CREDIT - 5 (2/0/1/2)
Prerequisite: no

PURPOSE AND OBJECTIVES OF THE COURSE - Acquisition of knowledge, skills and abilities on rational subsoil use within the framework of the legislation in force in the Republic of Kazakhstan.
Objective of the course:
- 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 Resolutions regulating subsoil use operations;
- mastering the basic principles of rational subsoil use and familiarity with departmental instructions and reporting of subsoil users;
- the acquisition of skills and abilities for the practical application of the knowledge gained while working in the specialty.

BRIEF DESCRIPTION OF THE COURSE
Legal 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 subsoil and natural environment. The environmental basis for conducting subsoil use operations. Safety of the population and personnel. State Subsoil Fund. Subsoil user's rights and obligations. Ownership of information on subsoil. Features of legal relations in the conduct of operations for the exploration and production of oil, groundwater, precious metals and precious stones and other minerals. Taxation of subsoil users

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
As a result of mastering the discipline, students should
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. Know the content of the state subsoil fund of the Republic of Kazakhstan.
2) be able to: draw up the necessary documents to obtain the subsoil use right and the draft subsoil use contract.
3) possess the skills: monitoring of subsoil use operations.

Mineral deposits of Kazakhstan
CODE - GEO218
CREDIT - 5 (2/0/1/2)
PREREQUISIT: GEO 115 General Geology

PURPOSE AND OBJECTIVES OF THE COURSE
The main task of the discipline is to obtain general information about mineral deposits in Kazakhstan, methods of their development, principles of mineral processing, etc.

BRIEF DESCRIPTION OF THE COURSE
State and prospects for the development of the mineral resource base of the Republic of Kazakhstan. Metallic minerals. Iron deposits. Manganese deposits. Deposits of chromium, titanium, vanadium. Deposits of copper. Deposits of lead and zinc. Deposits of aluminum, nickel, cobalt. Deposits of tungsten, molybdenum, tin. Deposits of tantalum, niobium, zirconium, rare earth elements. Deposits of noble metals (gold, silver). Deposit of radioactive metals. Uranium deposits. Non-metallic minerals. Deposits of building materials.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: Basic concepts and definitions of mineral deposits; basic concepts used to characterize different series of deposits; Basic minerals
Be able to: Analyze data; apply different approaches to data processing, Separate ore and vein minerals; Draw up a description of the deposit; Basic minerals
Have skills: Methods for determining minerals, rocks; Skills of working with geological literature on mineral deposits of various types; Skills of working with information sources on mineral deposits of various types; Skills in working with geological, technical and legal documentation; Skills in working with information sources on mineral deposits of various types

Geological structures of ore fields and deposits
CODE - GEO208
CREDIT - 5 (2/0/1/2)
PREREQUISIT: GEO 115 General Geology

PURPOSE AND OBJECTIVES OF THE COURSE
The aim of the course "Structures of ore fields and deposits" is to form undergraduates' ideas about the most important types of ore-bearing geological structures and the possibilities of using structural analysis to improve the efficiency of predictive research and prospecting and exploration.
Tasks - familiarization with the mechanisms of structure formation, mastering the methods of structural research in ore fields and deposits, the formation of skills in analysis
ore-bearing structures.

BRIEF DESCRIPTION OF THE COURSE
The course examines the main types of pre-ore structures of ore fields and deposits that are most widespread and identified on the basis of structural-genetic classification. The role and main types of intra-ore and post-ore structures are analyzed, the characteristics of ore pillars are given. The necessary information from the theory of deformation as applied to rocks is given. The physicomechanical and other properties of rocks that affect the structural conditions for the localization of ore bodies and deposits are considered. The fundamentals of special methods of structural studies in ore fields and deposits are presented.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: The main types of ore-bearing structures of deposits and ore fields, as well as the conditions and mechanisms of their formation and development.
Be able to: conduct a comprehensive analysis of ore-bearing structures of deposits for the purposes of forecasting, prospecting and exploration of ore bodies and deposits; predict the position of ore bodies and deposits in structures of different types.
Own: field and laboratory research methods at ore deposits.

GIS of uranium deposits
CODE - GEO211
CREDIT - 5 (1/0/2/2)
PREREQUISIT: GEO 115 General Geology

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of the course is to familiarize the undergraduate with the theoretical and geological foundations of methods for controlling the development of mineral resources, the possibility of using methods of geophysical research to solve geological and geophysical problems in the construction and operation of oil and gas fields, as well as for production, technological, experimental research, design activities

BRIEF DESCRIPTION OF THE COURSE
Determination of parameters of productive formations and wells by geophysical methods; formation of students 'theoretical foundations of methods of field geophysical research, development of students' ability to implement the acquired skills of conducting independent geophysical studies of wells and reservoirs; planning, carrying out and interpretation of the obtained results of geophysical studies for further application.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
The necessary conditions for mastering the discipline are:
Knowledge: the main indicators of the development of hydrocarbon deposits; basic properties of rocks; the basics of interpretation of well log data; the main instruments and equipment used in the conduct of geophysical research.
Ability: to use instruments and equipment for geophysical surveys of wells and reservoirs; interpret the results of geophysical studies of wells and reservoirs; determine the effectiveness of various GIS methods for solving

Geological support of subsoil use
CODE - GEO210
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of the course is to familiarize with the problems of interaction between man and geological space, patterns and forecast of anthropogenic changes in the geological environment, rational subsoil use and nature protection, legislative and regulatory documents.

BRIEF DESCRIPTION OF THE COURSE
Man-made processes at mining facilities, leading to the pollution of rocks, air, water, disruption of the stability of the subsoil and changes in the landscape, are described, the methodology for choosing a rational technology for the extraction of minerals, information on the disposal of waste during the extraction of minerals and waste products. The article presents a qualitative and quantitative ecological and economic assessment of the development of deposits and the necessary environmental protection measures, an assessment of the impact of mining on the environment. An environmental analysis of the development of new deposits is given.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
must know:
- to understand and have theoretical knowledge about the ecological functions of the lithosphere and the impact of technogenic activities on the geological space
should be able to:
- to assess the impact of mining on the elements of the geological environment;
must own:
- to foresee the reasons influencing the consequences of the impact of technogenesis on the natural geological environment.

Petrochemistry
CODE - GEO306
CREDIT - 5 (2/0/1/2)
PREREQUISIT: Petrography

PURPOSE AND OBJECTIVES OF THE COURSE
The aim of the course "Petrochemistry" is mastering knowledge for petrogenetic interpretation of the chemical composition of igneous rocks. Assimilation by students of knowledge about the composition and taxonomy of igneous rocks. Development of practical skills in applying modern methods of processing petrochemical data.
Tasks:
1.the development of basic concepts in modern concepts of the formation of rocks of various chemical composition;
2. development of the ability to control the quality of chemical analysis of rocks;
3. mastering the basic techniques for processing petrochemical data;
4. mastering the basic methods and approaches to the interpretation of petrochemical data for igneous rocks of various compositions.

BRIEF DESCRIPTION OF THE COURSE
The discipline "Petrochemistry" is aimed at mastering modern methods and approaches in the interpretation of petrochemical data for igneous rocks. Methods of chemical analysis of rocks and control of its quality, as well as sources of errors, are considered. Petrochemical modeling, Harker diagrams and trends on them, petrochemical coefficients and moduli, petrochemical recalculations, as well as statistical methods are considered. For each group of rocks (ultrabasic, basic, intermediate, granitoids), a complex of discriminant diagrams and approaches to the interpretation of petrochemical data is proposed.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: basic concepts in modern concepts of the formation of rocks of various chemical composition, variations in the concentrations of rock-forming components in the chemical composition of the main groups of rocks and the main factors that determine these variations.
Be able to: evaluate the quality of chemical analyzes of rocks, competently prepare rock samples for the analysis of chemical composition.
Own: methods of petrochemical recalculations, statistical methods of processing petrochemical data, modern approaches to the interpretation of petrochemical data.

Geochemistry of radioactive elements
CODE - GEO212
CREDIT - 5 (2/0/1/2)
PREREQUISIT: GEO 115 General Geology

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of teaching the discipline is to train specialists in the field of uranium geology with in-depth knowledge of the geochemistry of radioactive elements.
The main tasks in the study of the discipline are:
- deep understanding of the conditions and factors of migration and concentration of radioactive elements in geological processes;
- to gain knowledge about the mechanisms and forms of transfer and concentration of uranium and thorium in endogenous and exogenous processes;
- to gain skills in the development of prospecting geochemical criteria and signs of uranium mineralization.

BRIEF DESCRIPTION OF THE COURSE
This discipline provides for a detailed study of the geochemistry of uranium and thorium minerals characterized by a complex and variable chemical composition, which determines the variability of their physical properties. Many of these minerals have similar external features and optical properties, are metamict and X-ray amorphous, are easily transformed under the influence of superimposed processes (metastable), and are found in fine intergrowths with other minerals.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: the chemical composition of the Earth, its shells and the patterns of migration, concentration and dispersion of radioactive chemical elements in various geological processes and environments.
Be able to: analyze geochemical information and identify patterns of composition, structure and genesis of various geological formations.
Possess: the skills of thermodynamic assessment of the direction of geochemical processes and the environmental conditions necessary for their flow.

Geology of uranium deposits
CODE - GEO714
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The main goal of this academic discipline is to gain knowledge about the deposits of radioactive raw materials and rare elements, their genesis and industrial significance.

BRIEF DESCRIPTION OF THE COURSE
Principles of classification of uranium minerals. Features of the physical and physicochemical properties of uranium minerals. Mineralogy of uranium. Conditions for the formation of primary and secondary uranium minerals. Prevalence of radioactive elements. Geochemistry of uranium in endogenous and exogenous processes. Isotope geochemistry. Radiogeochemical mapping. Geological and industrial types of uranium deposits. Classification of deposits of rare and radioactive metals.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Having mastered the theoretical course and completing a set of laboratory tasks, the student will be able to solve the following tasks:
■ classify: deposits of rare and radioactive elements; geological and industrial types of deposits;
■ determine: genetic models of the formation of various types of deposits;
■ to establish patterns in the placement of deposits in the continental blocks of the Earth's crust

Mineralogy of radioactive and rare earth elements
CODE - GEO227
CREDIT - 5 (2/0/1/2)
PREREQUISIT: Mineralogy

PURPOSE AND OBJECTIVES OF THE COURSE
Training of specialists in the field of uranium geology with obtaining in-depth knowledge of the mineralogy of radioactive elements and their diagnostics. Students will gain knowledge on the mineral forms of finding radioactive and rare earth elements, methods of their diagnostics. Learn to distinguish paragenetic mineral associations according to the conditions of formation of specific minerals, assess the prospecting and industrial significance of the corresponding associations with the analysis of ore types and their belonging to the genetic classification of deposits.

BRIEF DESCRIPTION OF THE COURSE
This discipline provides for a detailed study of uranium and thorium minerals characterized by a complex and variable chemical composition, which
determines the variability of their physical properties. Many of these minerals have similar external features and optical properties, are metamict and X-ray amorphous, are easily transformed under the influence of superimposed processes (metastable), and are found in fine intergrowths with other minerals. Evaluation of external properties and signs, even supplemented by an optical characteristic, for individual minerals may be insufficient. In such cases, diagnostics and characterization of minerals are carried out on the basis of a complex of modern analysis methods.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: history, subject, tasks and methods of studying crystalline matter;
fundamentals of mineralogy and methods for the determination of uranium minerals (physical,
morphological) and their classification; possession of fundamental knowledge in the field of uranium geology and related disciplines at a high level;
Upon completion of the course, students should be able to: interpret the geochemical data of rare metal and radioactive elements (uranium and thorium and REE), determine by the optical, physicochemical characteristics of the minerals of the ores of rare and radioactive elements, master the methods of visual diagnostics of common minerals; generalize the parameters of elementary cells of minerals and diagnose them by their characteristic properties; conduct independent research in accordance with the developed program; use research results.

Genesis of the main industrial deposits
CODE - GEO 485
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
The aim of the course is to study the theory of the formation of deposits of various types of minerals and the proposed formation models. Discipline objectives: acquaintance with the existing ideas about the conditions for the formation of minerals; study of individual atypical forms of ore deposits; mastering the main provisions of the theory of magmatism, metallogeny and ore formation; study of the mechanism of formation of magmatic deposits; study of the formation mechanism of metamorphic deposits; the theory of the formation of groundwater and oil and gas fields.

BRIEF DESCRIPTION OF THE COURSE
World pyrite deposits, pyrite-bearing provinces, ore regions and nodes, typical deposits. Classification of genetic types: Cypriot, Ural, Brazilian type, the theory of their formation. Features of the formation of gold deposits in Kazakhstan. Spatio-temporal paragenetic connection of uranium and gold deposits, models of their formation. Uranium deposits, iron ore, copper deposits of Kazakhstan, their world analogues and the theory of their formation.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: industrial types of mineral deposits: iron, copper, gold, silver, lead, zinc and others. The theory of formation of pyrite, stratiform, hydrothermal and other deposits.
Be able to: analyze the geological position of the deposit and ore occurrences, highlight the structures of ore fields and bodies, draw up the order of mineral formation and recreate the tectono-stratigraphic conditions of the deposit formation.
Have the skills to analyze geological, tectonic maps, stratigraphic columns, based on a comprehensive analysis, be able to recreate and describe the genesis of industrial types of deposits.

Actual problems of stratigraphy
CODE - GEO 238
CREDIT - 5 (2/0/1/2)
PREREQUISIT: no

PURPOSE AND OBJECTIVES OF THE COURSE
Familiarization and assimilation of the stratigraphic development units by the undergraduates within the geological structures of Kazakhstan.

BRIEF DESCRIPTION OF THE COURSE
Stratigraphy is a special direction in a number of geological sciences, covering the issues of historical sequence, primary relationships and geographical distribution of sedimentary, volcanic, volcanic-sedimentary and metamorphic rocks that compose the earth's crust and reflect various stages of the Earth's development. The discipline covers the stratigraphic structure, problems and correlations in the territory of Kazakhstan.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Familiarization of undergraduates with the most important stratigraphic divisions of Kazakhstan; mastering the technique of dissecting sections of rock strata and identifying stratigraphic subdivisions of different rank; acquaintance with the principles of creating local, regional and interregional stratigraphic strata; regional and interregional stratigraphic correlation.

Regional geology of the CIS countries
CODE - GEO240
CREDIT - 5 (2/0/1/2)
PREREQUISIT: Geology of Mineral Deposits

PURPOSE AND OBJECTIVES OF THE COURSE
Acquaintance with the features of the geological structure, the history of geological development, the patterns of distribution of mineral deposits and their geological position in the earth's crust of the vast territory occupied by the neighboring countries (CIS and Baltic).

BRIEF DESCRIPTION OF THE COURSE
Fundamentals of tectonic zoning of the territory of the CIS and Baltic countries. Ancient platforms: East European platform, Siberian platform. Fold areas of the Ural-Mongolian belt: Ural-Novaya Zemlya fold area, South Tien Shan. Kazakh-Kyrgyz folded region, Zaysan folded system, Altai-Sayan folded region, Sayan-Yenisei folded region. Baikal and Transbaikalia. Taimyr-Severozemelskaya Oblast. Young Epipaleozoic plates of Eurasia: Scythian and Turanian plates, West Siberian plate. Areas of the Mediterranean belt of Cenozoic (alpine) folding within Europe: the Eastern Carpathians and the Mountainous Crimea, the Caucasian mountainous region. Areas of the Mediterranean belt of Cenozoic (alpine) folding within Asia: Kopetdag and Pamir. Areas of the Pacific belt of Mesozoic and Cenozoic (alpine) folding: Verkhoyansk-Chukotsak and Kamchatka-Koryak regions. Areas of the Pacific belt of Cenozoic (Alpine) folding: Mongol-Okhotsk, Sikhote-Alin and Sakhalin folded regions of the Far East of Russia. Kuril and Commander Islands.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: regional structures of the earth's crust of the studied territory in four positions: the principle of tectonic zoning of regional structures; the boundaries of each considered structure; know the features of the geological structure of the structure in terms of its stratigraphy and tectonics (development history); highlight mineral structures.
Be able to: analyze a tectonic map and a tectonic zoning map.
Have skills: analysis, comparison of geological data of one territory with another, reproduce the history of the geological development of the region and the allocation of structures and associated types of mineral deposits.

Lithological research methods
CODE - GEO 223
CREDIT - 5 (2/0/1/2)
PREREQUISIT: petrography

PURPOSE AND OBJECTIVES OF THE COURSE
Familiarization of students with the taxonomy of sedimentary rocks; methods of petrographic studies of sedimentary rocks; processes of lithogenesis, diagenesis, catagenesis and metagenesis. The general tasks of studying the discipline are: studying the petrography of sedimentary rocks, the processes of their accumulation and post-sedimentary changes; study of methods for studying sedimentary rocks; study of ways of describing sedimentary sections, constructing lithological columns and profiles, ways of interpreting them; study of methods for constructing lithological and paleogeographic maps.

BRIEF DESCRIPTION OF THE COURSE
Foundations of the theory of lithogenesis: hypergenesis, its factors, features of weathering in different climatic zones. Sedimentogenesis: features of the transport and accumulation of sediments, sedimentary differentiation. Diagenesis of sediments. Catagenesis, compaction of sedimentary rocks and processes of new formation of minerals. Sedimentary facies and their types; features of sedimentary rocks of various facies. Facial analysis methods: lithological, study of organic remains, study of the form of occurrence and structure of sedimentary rocks and their relationship with the surrounding formations, methods of facies mapping.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE
Know: the place of lithology in the cycle of geological sciences; classification of sedimentary rocks, the main features of sedimentary rocks and the possibilities of their interpretation, stages of sedimentogenesis, processes and results of diagenetic, catagenetic and metagenetic transformations of sedimentary rocks, minerals of sedimentary genesis.
Be able to: document sedimentary sequences, describe lithological thin sections, reconstruct, based on the observations made, the conditions for their formation and transformation.
Have skills: graphical presentation and geological interpretation of lithological data.

Master's thesis defense
CODE – ECA 203
The CREDIT – 12

The purpose of the master's thesis is:
demonstration of the level of scientific/research qualification of a master's student, the ability to independently conduct scientific research, checking the ability to solve specific scientific and practical problems, knowledge of the most general methods and techniques for solving them.

BRIEF DESCRIPTION
Master thesis – graduation qualification scientific work, which is a generalization of the results of independent studies undergraduates one of the pressing problems of a particular specialty relevant branch of science that has internal unity and reflects the progress and results of the development of the chosen topic.
Master's thesis-the result of research /experimental research work of a master's student, conducted during the entire period of study of the master's student.
The defense of a master's thesis is the final stage of master's training. A master's thesis must meet the following requirements:
– the work should be carried out research or solve current problems in the field of geology and exploration of solid mineral deposits
– the work should be based on the identification of important scientific problems and their solution;
- decisions must be scientifically based and reliable, have internal unity;
- the dissertation work must be written individually;

Content