NJSC «Kazakh national research technical university named after K. Satbayev»

Mining and metallurgical Institute named after |O.A. Baykonurov

Department of "Mining"

EDUCATIONAL PROGRAMM

6B07205 - "MINING ENGINEERING»

Bachelor of engineering and technology in the educational program

2st edition

in accordance with the state standard of higher education 2018

Almaty 2021

The program is drawn up and signed by the parties:

From KazNRTU named after K.I.Satbayev

Director of the mining and metallurgical Institute named after O.A. Baykonurov — Rysbekov K.B.

Head of the Department Mining — Moldabayev C.K.

Chair of the TG of the department, Professor — Sandibekov M.N.

From the employer:

1. Member of the Board of Directors of Kazakhaltyn Mining and Metallurgical Concern JSC, expert of Kazakhmys Corporation LLP, doctor of technical sciences, Professor Bitimbaev M.Zh.;
2. Director of the Inctitute of Mining named after D.A. Kunaev, doctor of technical sciences, professor Buktukov N.S.;
3. Vice president of LSC "Altynalmas" Bachramov B.A.

Approved at the meeting of the Academic Council of Kazakh national research technical university named after K.I. Satbayev. Protocol № 3 of 25.06.2021

Qualification:

Level 6 National Qualifications Framework:
B07 Engineering, manufacturing and construction industries
B072 Manufacturing and manufacturing industries (bachelor)

Professional competency: Providing deep theoretical knowledge and practical skills in the field of development of solid minerals; the ability to make effective engineering and technical decisions on the operation and reconstruction of mining enterprises, various objects on the surface and underground; the presence of professional skills in working with a computer as a means of control, with general-purpose software; knowledge of the main technological processes at the mining enterprises of ferrous and non-ferrous metallurgy, heat and power complex, nuclear industry, metro construction, depending on the chosen direction of training.

Content

1 Normative references

Table 1 - a List of regulatory and other documents, links to which are present in the document

№	Document's name	Storage
1	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 from 04.07.18, No. 171-VI.	Registrar Office (RO) http://online.zakon.kz/Document/?doc_id=30118747
2	State compulsory standard of higher education (Appendix 7 to the order of the Minister of Education and Science of the Republic of Kazakhstan dated 10.31.18, No. 604	RO http://online.zakon.kz
3	European Higher Education Qualifications Framework	RO http://ecahe.eu/w/images/7/76/A_Framework_for_Qualifications_for_the_European_Higher_Education_Area.pdf
4	Dublin descriptors	http://ecahe.eu/w/index.php/Dublin_Descriptors
5	GOST 3.1105-2011 Unified system of technological documentation (ESTD). Forms and rules for processing general-purpose documents	http://online.zakon.kz/document/?doc_id=31194118
6	Regulations Satbayev University	Department of Internal Audit
7	National qualifications framework. Astana, 2016	https://atameken.kz/uploads/content/files/Национальная рамка квалификаций_2016.pdf
8	Professional standard	https://atameken.kz/uploads/content/files/.pdf
9	Образовательная программа «Горная инженерия»	https://official.satbayev.university/download/document/17466/Горная инженерия ру 2018.pdf

2 Abbreviations used, terms and definitions

Table 2 - Abbreviations Used

Abbreviation	Full name
ECTS	European credit transfer and accumulation system
SU	Satbayev university
ME&SRK	Ministry of Education and Science of the Republic of Kazakhstan
PPS	Professorsko-prepodavatel'skiy sostav
EP	Educational program
RO	Registrar Office
SP	OP curriculum

Table 3 - Terms and definitions used in the text of the document

Term	Definition
1st Cycle (Бакалавриат)	The level of higher professional education with the award of the academic degree "Bachelor"
Bachelor (Бакалавр)	Academic degree awarded to individuals who have completed the undergraduate education program
Dublin descriptors (Дублинские дескрипторы)	An integral part of the European framework for higher education qualifications describing the degree of development of competencies
Competency (Компетенции)	The ability of students to apply the knowledge acquired in the learning process in the professional activity
Audit (Контроль)	Qualitative characteristic of student assessment system
Credit Education (Кредитная технология обучения)	Learning on the basis of the choice and independent planning by the student of the sequence of studying disciplines using credit as a unified unit of measuring the volume of academic work of the student and teacher
Matrix of Competencies (Матрица компетенций)	Based on Dublin descriptors describing the depth of development of competencies in the framework of the EP
Cycle (Модульное обучение)	The segment of mastering and the depth of mastering by a student of competencies having an intermediate completed cycle
Curriculum (Образовательная программа или ОП)	Description of the educational process based on the achievements of learning outcomes and competencies for obtaining a recognized diploma in a specific field of professional activity
Trainees (students)	Undergraduate students
Assessment (Оценка)	The quantitative characteristic of the student assessment system
Associate Degree, Short Cycle (Прикладной бакалавриат Общеинженерный)	Completion of the minimum undergraduate framework with the development of at least 124 credits of theoretical training
Curriculum (Рабочий учебный план)	A document containing a complete list of academic disciplines of the compulsory component and a component of choice, indicating the number of credits, the sequence of study of disciplines, types of studies and forms of control
Framework of Competencies (Рамка компетенций)	Based on Dublin descriptors describing the depth of development of competencies
Outcome results (Результаты обучения)	Knowledge, skills, qualification characteristics, competence
Sub-competency (Субкомпетенции)	The ability of students to apply the knowledge acquired in the learning process, skills within the framework of a specific competency
Graduate (Студент выпускного курса или выпускник)	Persons from among the students (students) who have successfully mastered the full theoretical course of study

3 Brief description of the program

The specialty "Mining" has its own characteristics. The educational program (OP) takes into account the mining operations by open and underground methods, the geotechnology of developing uranium deposits (PSV uranium), the construction of mines and underground structures, and mine surveying. In OP, depending on the learning path, modern trends in the development of mining in market conditions are taken into account under various mining methods.

In OP, depending on the learning path, modern trends in the development of mining in market conditions are taken into account under various mining methods.

The purpose of the educational program:

Training for enterprises of the mining complex of professionally educated and competent specialists who are able to work in primary engineering and technical positions and efficiently produce natural resources in various mining and geological and mining conditions based on advanced technologies and modern mining transportation equipment.

The objectives of the educational program:

- the study of the cycle of *general educational* disciplines to ensure social and humanitarian education on the basis of the laws of socio-economic development of society, history, modern information technologies, the state language, foreign and Russian languages;
- study of the cycle of *basic disciplines* to ensure knowledge of natural sciences, general technical and economic disciplines, as the foundation of vocational education;
- The cycle of majors is focused on the study of key theoretical aspects of engineering and technology to ensure the safe and effective implementation of various technologies for mining, processing of solid minerals and the rational use of natural resources;
- the study of disciplines on the development of uranium deposits, the extraction of natural resources by open and underground methods based on advanced technologies, planning the construction of industrial facilities at mining enterprises and urban underground structures for various purposes.
- the study of disciplines that form the knowledge of skills and planning skills and organization of research, mining design;
- familiarization with the technologies and equipment of enterprises during various types of practices.
- the acquisition of skills in laboratory research, technological calculations, equipment selection and design using modern computer technologies and programs.

The area of professional activity of the bachelor of the educational program "Mining" includes the engineering support of human activity in the bowels of the earth during operational exploration, mining and processing of solid minerals, construction and operation of underground facilities for various purposes.

The objects of professional activity of a bachelor are:

- the bowels of the Earth, including production facilities, equipment and technical systems for their development;
- equipment and technologies to ensure the safe and effective implementation of geotechnologies for mining, processing of solid minerals and rational use of natural resources;
- mining machinery and equipment for various functional purposes (for open and underground mining);
- measures to ensure the safe operation of mining machinery and equipment and reduce their technological pressure on the environment.

Types of professional activity are:

Organizational and managerial:

- organization, planning and management of mining and construction works;
- carrying out organizational and planned calculations for the creation (reorganization) of production sites;
- development of operational work plans for production units;
- preparation of baseline data for the selection and justification of scientific, technical and organizational decisions based on economic calculations.

Production and technological:

- Organization of the production process during the construction, operation and reconstruction of mining enterprises, various objects on the surface and underground;
- ensuring the implementation of mining and construction works in accordance with projects, technical requirements and safety rules;
- selection of equipment and materials to ensure production processes;
- the effective use of materials, equipment, algorithms and programs for the selection and calculation of process parameters.

Experimental research.

- collection and systematization of scientific and technical information of domestic and world experience in relation to solving the problems of mining;
- mathematical modeling of mining processes and mining facilities based on standard packages of computer-aided design and research;
- planning, conducting experiments according to specified techniques, mathematical processing and analysis of results.

Settlement and design and analytical:

- the formation of the goals and objectives of the project (program), providing a modern level of technology for the construction, operation and reconstruction of mining enterprises;
- collection and analysis of information source data for design;
- development of design documentation for the construction, operation and reconstruction of mining enterprises;

- conducting a preliminary feasibility study of design calculations;
- implementation of projects in production and field supervision.

The subjects of the professional activity of the bachelor is the improvement of the technology of mining, the development and creation of new equipment and technology for mining, considering the needs of the mining and nuclear industries of the Republic of Kazakhstan.

The specific types of professional activities for which the bachelor mainly prepares are determined by the higher educational institution together with students, scientific and pedagogical workers of the higher educational institution and associations of employers.

4 Volume and content of program

The volume of the undergraduate educational program is 260 credits, regardless of the form of study, the educational technologies used, the implementation of the undergraduate program using the online form, the implementation of the undergraduate program according to an individual curriculum, including accelerated learning.

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

- obtaining a full-fledged and high-quality professional education in the field of development of mineral deposits (MPI), confirmed by the level of knowledge and skills, competencies, on the basis of criteria established by the State educational standard, their assessment, both in content and volume

-provision of preparation of bachelors for the mining industry, knowing the technology, complex mechanization, organization and economics of mining, methods and principles of its improvement and design. For example, highly mechanized coal mines of Ekibastuz (Bogatyr Komir LLP, Vostochny open pit, Eurasian Energy Corporation JSC), enterprises of high production culture on the basis of iron ore deposits (Sokolovsko-Sarbaisky mining and processing industrial association JSC) and uranium mines under development deposits (KazATOMPROM), etc:

- training of professional and competitive specialists in the field of development of mineral resources and the creation of new technologies for mining and production management;

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

-use of methods for analysis and evaluation of experimental results;

- knowledge of modern problems of mining;
- contribute to the acquisition of practical skills in the development of minerals,

mathematical processing of scientific research results, compilation of technological passports of technological processes using modern information technologies;

- the ability to use 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 the students' teamwork skills, production and ethical responsibility, the ability to understand the problem and from working with various specialists to 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 solve problems independently;

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

- be able to conduct analysis and monitoring, as well as make managerial decisions based on their results;

- possess erudition, knowledge of modern social and political problems, speak state Russian and foreign languages, instruments of a market economy, safety and environmental issues.

5 Requirements for candidates

The admission of persons entering KazNITU is carried out by placing a state educational order (educational grants), as well as tuition fees at the expense of citizens and other sources.

Admission is carried out at the request of an applicant who has completed the full secondary, specialized secondary education on a competitive basis in accordance with the points of a certificate issued according to the results of a single national test (hereinafter - UNT) or complex test. To participate in the competition, you must score at least 65 points when entering a national university.

Special requirements for admission to the program, if any, including for graduates of 12 summer schools, colleges of applied undergraduate programs, etc.

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

Credit transfer rules for accelerated (shortened) education on the basis of 12-year secondary, secondary technical and higher education

Code	Competence	Description of competence	Results of competence	Person in charge
TOTAL (It implies full training with possible additional depending on the level of knowledge)				
G1	Communication	-fluent monolingual oral, written and communicative skills; -the ability to not fluent communication with a second language; -the ability to use communicative in various situations; - there are the basics of academic writing in the native language; - diagnostic test for language level	Full 4-year training with the development of at least 324 academic loans (of which 196 contact classroom academic loans) with the possible transfer of loans in a second language where students have an advanced level. Language level is determined by a diagnostic test	Department of Kazakh and Russian, Department of English
G2	Math skills	- basic mathematical thinking at the communication level - the ability to solve situational problems on the basis of the mathematical apparatus of algebra and the beginnings of mathematical analysis; - diagnostic test for mathematical literacy in algebra	Full 4-year training with the development of at least 324 academic loans (of which 196 contact classroom academic loans). With a positive diagnostic test, the level is Mathematics 1, with a negateve - the level of Algebra and the beginning of the analysis	Math department
G3	Base competence in technical sciences	- a basic understanding of the scientific picture of the world with an understanding of the essence of the basic laws of science; -understanding of basic hypotheses, laws, methods, formulation of conclusions and estimation of errors	Full 4-year training with the development of at least 324 academic loans (of which 196 contact classroom academic loans). If the diagnostic test is positive, the level is Physics1, General Chemistry, if it is negative, the level of the Beginning of Physics and the Basic Principles of Chemistry	Departments in the areas of natural sciences
SPECIFIC (implies reduced training by transferring loans, depending on the level of knowledge of competencies for graduates of 12-year schools, colleges, universities, including humanitarian and economic areas)				
S1	Communication	- fluent bilingual oral, written and communication skills; - the ability to not fluent communication with a third language; - writing skills of various styles and genres; - skills of deep understanding and interpretation of one's own work of a certain level of complexity (essay); - basic aesthetic and theoretical literacy as a condition for full	Full transfer of loans by language (Kazakh and Russian)	Department of Kazakh and Russian languages

		perception, interpretation of the original text		
S2	Math skills	-special mathematical thinking using induction and deduction, generalization and concretization, analysis and synthesis, classifi-cation and systematization, abstraction and analogy; - the ability to formulate, justify and prove the provisions; - application of general mathematical concepts, formulas and extended spatial perception for mathematical problems; - full understanding of the basics of mathematical analysis	Transfer of credits in the discipline Mathematics I (Calculus)	Math department
S3	Special literacy in natural sciences (Physics, Chemistry, Biology and Geography)	- a wide scientific perception of the world, involving a deep understanding of natural phenomena; -critical perception for understanding the scientific phenomena of the world; - cognitive abilities to formulate a scientific understanding of the forms of existence of matter, its interaction and manifestations in nature	Loan transfer on Physics I, General chemistry, General biology, Introduction to geology, Introduction to geodesy; Training practice, etc	Departments in the areas of natural sciences
S4	English	- readiness for further selfstudy in English in various fields of knowledge; - willingness to gain experience in design and research using English	Transfer of English loans above academic to professional (up to 15 credits)	English department
S5	Computer skills	- basic programming skills in one modern language; -the use of software and applications for training in various disciplines; -the presence of a global standard certificate of language level	Relocation of loans in the discipline Introduction to information and communication technologies, Information and communication technologies	Progrmming engineering department
S6	Social and humanitarian competencies and behavior	- understanding and awareness of the responsibility of every citizen for the development of the country and the world; - ability to discuss ethical and moral aspects in society, culture and science; -critical understanding and ability to debate for debating on modern scientific hypotheses and theories	Transfer of loans on the modern history of Kazakhstan (with the exception of the state exam) Relocation of loans in philosophy and other humanitarian disciplin	Natural sciences department

PROFESSIONAL (implies reduced training by transferring loans depending on the level of knowledge of competencies for graduates of colleges, AV schools, universities, including humanitarian and economic areas)				
P1	Professional skills	- critical perception and deep understanding of professional competencies at the level of 4, 5 or 6; - Ability to discuss and debate on professional issues within the framework of the mastered program	Relocation of loans in basic professional disciplines, including introduction to a specialty, construction of a mining enterprise, destruction of rocks by mining, mining technology, rock physics, aerology of mining enterprises,mineral processing and enrichment, educational and industrial practice	Main department
P2	Basic engineering skills	- basic engineering skills and knowledge, ability to solve engineering problems and problems; - be able to use application packages for processing experimental data, solving systems of algebraic and differential equations	Relocation of credits in general engineering disciplines (Engineering graphics, descriptive geometry, fundamentals of mechanics, fundamentals of hydrodynamics, fundamentals of electrical engineering, fundamentals of microelectronics, fundamentals of thermodynamics, etc.)	Main department
P3	Engineering computer skills	- basic skills in the use of computer programs and software systems for solving general engineering problems	Relocation of loans in the following disciplines of computer graphics, the basics of CAD, the basics of CAE, etc.	Main department
P4	Engineering work skills	- skills and abilities to use technical means and experimental devices for solving general engineering problems	Relocation of credits in academic disciplines of the experimental direction: if there are certificates of an assistant excavator driver, an assistant drilling rig operator, an assistant driller, etc.	Main department
P5	Social-economical skills	- critical understanding and cognitive ability to reason on contemporary social and economic issues; - a basic understanding of the economic valuation of objects of study and the profitability of industry projects	Relocation of loans in socio-humanitarian and technical and economic disciplines to offset the elective cycle	Main department

The university may refuse to transfer credits if a low diagnostic level is confirmed or the final grades for completed disciplines were lower than A and B.

6 Requirementsforcompletingeducationandreceiving diploma

The graduate of this educational program is awarded the academic degree “Bachelor of Engineering and Technology”.

Graduated bachelors must have in-depth knowledge and skills in the field of mining mineral deposits. They should have practical experience based on the study of basic and specialized disciplines, and the study of engineering and technology during all types of practices. They should have the knowledge and skills to analyze equipment and technologies, and identify existing problems. Graduates should be able to develop engineering projects based on integrated technical and economic calculations.

Bachelors must have communication skills to be able to present their ideas and information, verbally and in writing. The specialist should be able to present graphical information in the form of drawings, 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, be able to adapt to new situations in a professional environment. A specialist should have the ability to perceive diversity and intercultural diversity, appreciate the diverse approaches to understanding and solving society's problems.

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

Bachelors should have a good knowledge of Kazakh, Russian and foreign languages, be capable of working in the international community, and maintain ethical rules in society, at work and in interpersonal communication. They must demonstrate skills in achieving goals, solving problems in unusual situations. Specialists should take care of environmental protection and, while improving their qualifications, serve the development of the welfare of the whole society.

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

Qualification:

Level 6 of the National Qualifications Framework:

B07 Engineering, manufacturing and construction industries

B072 Manufacturing and manufacturing industries (bachelor)

7 Workplan of the educational program

APPROVED
Chairman of the Board -
Rector of the "KazNRTU named after K.I.Satpayev"
_____ M.M. Begentayev
"__" ____ 2021

Full-time: study

Academic degree: bachelor of engineering and technology

Year of study	Code	Name of discipline	Cycle	Totel Credits	total hours	lec/lab/pr	SIS (including STIS), in	Code	pre-requisites
		1 semester (fall 2021)							
1	LNG 108	Beginner (A1)	G	5	150	0/0/3	105	S4	Diagnostic test
	LNG104	Kazakh/Russian (A2)	G	5	150	0/0/3	105	S1	Diagnostic test
	MAP519	Geodesy	B	5	150	1/0/2	105	P1-3	no
	PHY468	Physics	B	5	150	1/1/1	105		
	MAT101	Calculus I	B	5	150	1/0/2	105	S2	Diagnostic test
	GEN177	Engineering and Computer Graphics	B	5	150	1/0/2	105		no
	HUM129	Cultural studies	G	2	60	1/0/0	45		
	KFK101	Physical education I	G	2	60	0/0/2	30		
		in total:		34		21			
		3 semester (fall 2022)							
2	HUM132	Phylosophy	G	5	150	1/0/2	105		
	HUM122	Psychology	G	2	60	1/0/0	45		
	MNG487	Fundamentals of entrepreneurship, leadership, and anti-corruption culture	G	3	90	1/0/1	60		
	CHE451	Life safety	G	2	60	1/0/0	45		
	MIN109	Integrated information systems in mining	B	5	150	1/2/0	105		MIN101
	GEO475	Fundamentals of geology	B	5	150	2/1/0	105	P1-3	
	MIN442	Shattering process	B	5	150	1/1/1	105	P1-3	MIN101
	AAP122	Physical education I, II (G)	G	2	60	0/0/2	30		
		in total:		29		18			
		5 semester (fall 2023)							
3	ERG554	Operation of electrical installations with a voltage of up to and over 1000V	B	2	60	1/0/0	45		PHY001
	MIN453	Open-cast mining technology	B	5	150	1/0/2	105	P1-3	MIN101
	MET179	Processing and enrichment of minerals	B	5	150	2/1/0	105	P1-3	CHE192
	3217	Elective	B	5	150	2/0/1	105	P1-3	
	3218	Elective	B	5	150	2/0/1	105	P1-3	
	3303	Elective	P	5	150	2/0/1	105	P1-3	
		in total:		27		16			
		7 semester (fall 2024)							
4	MIN478	Aerology of consessions	P	5	150	2/1/0	105	no	MIN101
	4307	Elective	P	5	150	2/0/1	105		
	4308	Elective	P	5	150	2/0/1	105		
	4309	Elective	P	5	150	2/0/1	105		
		in total:		20		12			

Code	Name of discipline	Cycle	Totel Credits	total hours	lec/lab/pr	SIS (including STIS), in	Code	pre-requisites
	2 semester (spring 2022)							
LNG 108	Elementary English (A1)	G	5	150	0/0/3	105	S4	LNG 105
LNG104	Academic Kazakh/Russian (B1)	G	5	150	0/0/3	105	S1	
HUM100	Contemporary History of Kazakhstan (State exam)	G	5	150	1/0/2	105	S6	no
MAT102	Calculus II	B	5	150	1/0/2	105	S6	MAT101
MIN101	Bases of mining (Introduction to specialty)	P	5	150	1/0/2	105	S3	no
HUM128	Political science	G	2	60	1/0/0	45		no
CHE495	Chemistry	B	5	150	1/1/1	105		
KFK102	Physical education II	G	2	60	0/0/2	30		
	in total:		34		21			
	4 semester (spring 2023)							
CSE677	Information & Communication Technologies	G	5	150	2/1/0	105	S5	no
HUM127	Socialogy	G	2	60	1/0/0/	45		
CHE452	Ecology, life safety and sustainable development	G	2	60	1/0/0	45		
MIN443	Numerical 3D modeling of geomechanical processes	B	5	150	1/2/0	105		
MIN447	Physics of rock mass	B	5	150	1/2/0	105	P1-3	MIN101
MIN166	Classification of mining enterprises	B	5	150	1/1/1	105	P1-3	MIN101
MIN444	Datamine Workbook	B	5	150	1/0/2	105		MIN439
2214	Elective	B	5	150	1/0/2	105	P1-3	
AAP132	Physical education IV	G	2	60	0/0/2	30		
	in total:		36		22			
	6 semester (spring 2024)							
MIN445	Финансово-экономическая модель горного предприятия	B	5	150	2/0/1	105		
MIN458	Technology of underground mining operations	B	5	150	1/0/2	105	P1-3	MIN 126
3221	Elective	B	5	150	2/0/1	105		
3304	Elective	P	5	150	2/0/1	105		
3305	Elective	P	5	150	2/0/1	105		
3222	Elective	B	5	150	2/0/1	105		
	in total:		30		18			
	8 semester (spring 2025)							
4310	Elective	P	5	150	2/0/1	105		
4311	Elective	P	5	150	2/0/1	105		
ECA003	*Preparation	FA	6					
ECA103	Thesis (project) defence*	FA	6					
	in total:		22		6			

Other academic education (OAE)

Year of	Code	Name of discipline	Cycle	credits	Semester
		Obligatory education with P/NP assessment			
1	AAP101	Educational Internship (B)	B	2	2
1	AAP109	Industrial internship I (S)	B	3	4
2	AAP158	Industrial internship II (S)	P	5	6
		Other education			
2	AAP107,	Physical education III, IV	0	0	5-7
2-3	AAP500	Military training	0	0	3-6

	Credits			
		elective		
Cycle of general discipli	58			58
Cycle of basic disciplines (B)	87	25		11_
C				
	1			
Final attestation (FA)	12	0		12
Total:	1	65		
/ERALL:	1	65		

Decision of the Academic Council KazNRTU named after K.I.Satpayev. Minutes № 3, dated 25 06 2021.

"__" January 2

"__" ______ 2021.

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

Approved by:
Director of Geology, Oil and Mining institute
A.N.Svezhkov
«__» _____ 2021 .

MAJOR ELECTIVE DISCIPLINES for 2021-2022 academic year admission
Educational program 6B07205 - "Mining engineering"

Full-time study | Study duration : 4 years | Academic degree: bachelor of engineering and technology

year of study	Code of elective	Code of discipline	Name of discipline	Cycle	Credits	total times	lecture/ laboratory/ practice	SIS (including STIS), in hours	Prerequisites
			4 semester						
	2214	MIN449	Open-pit mining processes	B	5	150	1/0/2	105	MIN101
		MIN450	Deposit opening and devolopment when underground mining				2/0/1		MIN101
		MIN451	Deposit opening and devolopment when uranium undeground borehole				2/0/1		MIN101
		MIN452	Industrial explosives				1/1/1		MIN101
		MIN459	Mechanics of underground structures				2/0/1		MIN180
		MAP530	General course of surveying				1/0/2		MAP519
			In total:		5		6		
			5 semester						
	3217	MIN460	Interconnection and planning of open cast mining processes	B	5	150	2/0/1	105	MIN101
		MIN454	Underground mining operations processes				2/0/1		MIN101
		MIN461	Uranium deposits underground mining geotechnology				2/0/1		MIN101
		MIN462	Underground construction facilities				2/0/1		MIN101
		MAP529	Mine surveying drawing				0/0/3/2		MAP519
	3218	TEC186	Opencast mine mining and transport equipment	B	5	150	2/0/1	105	MIN101
		PED147	Mining-and-transport equipment of underground mines				2/0/1		MIN101
		MIN455	Shield tunneling complexes				2/0/1		
		MAP531	Surveying support of mining operations during the construction of mining enterprises				1/0/2		MAP519
	3303	MIN463	Special methods of conductieg open cast mining operations	P	5	150	2/0/1	105	MIN101
		MIN464	Design and computer style for mining operations development plans				1/0/2		MIN101
		MIN465	Горная графика при подземной добыче урановых месторождений				1/0/2		MIN101
		MIN456	Technology of construction of tunnels				2/0/1		MIN101
		MIN457	Ways to support underground structures				2/0/1		MIN101
		MAP520	Surveying-geodesy instruments				1/0/2		MAP519
			In total:		15		12		
			6 semester						
3	3221	MIN466	Resource-saving and low-waste technology on ore mines	B	5	150	2/0/1	105	MIN101
		MIN467	Mineral deposits underground mining systems				2/0/1		MIN101
		MIN468	Solutions hydraulics when uranium development				2/0/1		MIN101
		MIN469	Technology of construction of vertical mine workings				2/0/1		MIN101
		MAP532	Mathematical processing of surveying and geodetic measurements				1/0/2		MAP519
	3304	MIN470	Technological complexes of open cast mining operations	P	5	150	2/0/1	105	MIN101
		MIN131	Underground mines air supply				2/0/1		MIN101
		MIN471	Geotechnological wells drilling and operation				2/0/1		MIN101
		MIN472	Calculation of the design of underground structures				2/0/1		MIN101
		MAP528	GIS cartography in mining				1/0/2		MAP519
	3305	MIN473	Open development of building materials	P	5	150	1/0/2	105	MIN101
		MIN474	Technology and complex mechanization of underground mining				2/0/1		MIN101
		MIN475	Equipment of geotechnological fields at uranium dillhole in situ leaching				2/0/1		MIN101
		MIN476	Design of construction of mining facilities				2/0/1		MIN101
		MAP521	Mine surveying at open pit mining				1/0/2		MAP519
	3222	MIN477	Opening of career fields	B	5	150	1/0/2	105	MIN101
		MIN478	Subsoil use contract and license				2/0/1		MIN101
		MIN479	Geotechnological methods of development of solid minerals				2/0/1		MIN101
		MIN480	Special ways of building underground structures				2/0/1		MIN101
		MAP522	Mine surveying for the construction of mines				1/0/2		MAP519
			In total:		20		9		
			7 semester						
4	4307	MIN482	Conducting mine workings at quarries	P	5	150	1/0/2	105	MIN101
		MIN483	Rock conditions management				2/0/1		MIN101
		MIN484	Fields development in special conditions				2/0/1		MIN101
		MIN485	Special drilling and blasting operations				2/0/1		MIN101
		MIN486	Construction of underground hydraulic structures				2/0/1		MIN101
		MAP524	Geomechanics				1/0/2		MAP519
	4308	MIN487	Prospective and current planning of open cast mining operations	P	5	150	2/0/1	105	MIN101
		MIN488	Product guality management				2/0/1		MIN101
		MIN489	Technology and mechanization of piling works				2/0/1		MIN101
		MIN490	Separate methodes of uranium deposits development				2/0/1		MIN101
		MIN491	Designing of blasting operations				2/0/1		MIN101
		MIN492	Designing of construction of underground mining enterprises				2/0/1		MIN101
		MAP525	Mine Survey of underground development systems				1/0/2		MAP519
	4309	MIN493	Reclamation of disturbed lands on mines	P	5	150	2/0/1	105	MIN101
		MIN 494	Layout of underground mines plan				2/0/1		MIN101
		MIN501	Layout of underground deposits plan				2/0/1		MIN101
		MIN495	Technology of construction of horizontal and inclined mine workings				2/0/1		MIN101
		MAP523	Geometry of subsoil				1/0/2		MAP519
			In total:		15		9		
			8 semester						
5	4310	MIN496	Design of ore and coal mines	P	5	150	1/0/2	105	MIN101
		MIN497	Mines conservation				2/0/1		MIN101
		MIN498	Uranium deposits conservation				2/0/1		MIN101
		MIN499	Реконструкция шахт и подземных сооружений				2/0/1		MIN101
		MAP527	Mine survey software				1/0/2		MAP519
	4311	MIN500	Systems of open development of mineral deposits	P	5	150	1/0/2	105	MIN101
		MIN441	Sheet deposits underground mining				2/0/1		MIN101
		MIN432	Underground development of indigenous and alluvial deposits				2/0/1		MIN101
		MIN433	Technology of construction of urban underground structures				2/0/1		MIN101
		MAP526	Mine surveying of the construction of tunnels				1/0/2		MAP519
			In total:		10		6		

Credits numbers of elective disciplines over the entire period of study	
Cycles of disciplines	Credits
Cycle of general disciplines (G)	0
Cycle of basic disciplines (B)	25
Cycle of special disciplines (S)	40
Total:	65

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

Decision of the Educational and Methodological Board of KazNRTU named after K.I.Satpayev. Minutes № 6, dated "14" 06 2021.

Decision of the Academic Council of the School of Industrial Engineering. Minutes № 5, dated "24" 12 2020.

Head of the Department "Mining" S.K.Moldabayev

Chairman of the Specialty Council from employers N.S. Buktukov

8 Competencies acquired by students during the development of the educational program " 6B07205 - Mining engineering»

General cultural competences (GCC)	
GCC - 1	Ability to communicate orally and in writing in the state, Russian and foreign languages to solve problems of interpersonal and intercultural interaction
GCC - 2	Understanding and practical use of healthy lifestyle norms, including prevention issues, and the ability to use physical culture to optimize performance
GCC - 3	The ability to analyze the main stages and patterns of historical development of society to form a civil position
GCC - 4	The ability to use the basics of philosophical knowledge to form a worldview position
GCC - 5	Ability to critically use the methods of modern science in practice
GCC - 6	Awareness of the need and acquisition of the ability to independently study and improve their skills throughout their working life
GCC - 7	Knowledge and understanding of professional ethical standards, proficiency in professional communication techniques
GCC - 8	Ability to work in a team, tolerant of social, ethnic, religious and cultural differences
GCC - 9	Ability to use the basics of mathematical knowledge in various fields of activity, apply the theory of partial differential equations to solve and study applied problems, form ideas about the implementation of numerical methods for solving boundary value problems using Matlab
General professional competences (GPC)	
GPC -1	The ability to acquire new knowledge with a high degree of independence using modern educational and information technologies
GPC -2	Possession of computer skills sufficient for professional work with basic programming
GPC -3	Knowledge of the main methods, methods and means of obtaining, storing, and processing information, and the ability to use modern technical tools and information technologies for solving communication problems using traditional information carriers, distributed knowledge bases, and information in global computer networks
ОПК-4	Understanding the essence and meaning of information in the development of modern society, the ability to receive and process information from various sources, the willingness to interpret, structure and design information in a way that is accessible to others
GPC -5	Ability to solve standard tasks of professional activity on the basis of information and bibliographic culture with the use of information and communication technologies and taking into account the basic requirements of information security
GPC -6	Knowledge of the main methods and methods of MPI development, the main technological processes of mining production, opening schemes and PI development systems, as well as complex mechanization of mining operations
GPC -7	Understanding the nature and significance of the relationship between production processes and their impact on the efficiency of the entire mining industry, allowing rational use of natural resources, waste-free technology and reduce the negative impact on the environment
GPC -8	The ability to logically represent the acquired knowledge and understanding of system relationships in the production processes of mining, in the sinking of main and auxiliary mine workings

GPC -9	Perform basic calculations of the main parameters of technological processes when developing MPI by open and underground methods, well development of uranium deposits, and justify their choice
Professional competence (PC)	
P	Professional competencies, including according to the requirements of industry professional standards, providing deep theoretical knowledge and practical skills in the field of development of solid minerals
PC 1	A wide range of theoretical and practical knowledge in the professional field, technology and complex mechanization of mining and blasting operations, applied and promising methods for the full and integrated development of mineral resources taking into account industrial, environmental safety
PC 2	Identify the main rock-forming minerals, the main types of rocks and types of ores
PC 3	Master the issues of the main technological processes at the mining enterprises of ferrous and non-ferrous metallurgy, the heat and power complex, non-metallic building materials, the nuclear industry, the construction of the subway depending on the chosen direction of preparation
PC 4	Willingness to determine the spatio-temporal characteristics of the state of the earth's surface and subsoil, mining systems, underground and ground structures and display information in accordance with current regulatory requirements
PC 5	Willingness to monitor the status of mine workings, buildings, structures and the earth's surface at all stages of development and protection of mineral resources using digital technology
PC 6	Skills to apply modern information technology, automated production control systems to create SMART mines
PC 7	Independently draw up passports, technological regulations, plans for mining and technological processes of mining and to manage their implementation in primary positions
PC 8	Willingness to make a feasibility study of the conditions of construction, investment; to choose space-planning solutions and the main parameters of the engineering structures of underground facilities, to calculate them for strength, stability and deformability, to select materials for the engineering structures of underground and mining buildings and structures on the surface
PC 9	Own the modern assortment, composition, properties and field of application of industrial explosive materials, equipment and explosive devices approved for use in the Republic of Kazakhstan, the main physical, technical and technological properties of mineral raw materials and host rocks, characteristics of the state of rock massifs, construction sites and reconstruction
PC 10	The ability to develop, implement and control the quality and completeness of drilling and blasting projects in mining, mining and construction and special works, seismic exploration, as well as in other industries
PC 11	To be able to make effective engineering decisions, participate in the organization of the production process during the construction, operation and reconstruction of mining enterprises, various objects on the surface and underground
PC 12	Have professional skills of working with a computer as a management tool, ready to work with General-purpose software tools (Macromine, Datamine, etc.)

PC 13	The ability to independently master new technological, mining complexes, technological and technical documentation, regulatory documents to make adjustments to it in relation to operating conditions, correctly formulate the safe operation of technological equipment
PC 14	Skills for conducting scientific research, performing laboratory and experimental studies with subsequent processing of the results using modern computer technologies, improving existing and developing new research methods and techniques, technical and technological solutions and hardware for their implementation, selection of technical means for scientific and research work
PC 15	Skills to conduct marketing research, evaluate logistics, market and production risks
PC 16	The ability to analyze and apply when working laws on subsoil and subsoil use, industrial safety and the environmental code, regularly monitor changes and additions to these laws
PC 17	The ability to design systems for protecting people from dangerous and harmful factors in the production environment of mining enterprises on the basis of scientifically based methods and regulatory documents to ensure safe mining operations using various mining technologies, developing underground space, taking into account international experience and the requirements of international standards safety, and environmental protection
PC 18	The ability to choose the technology for the production of mineral processing works, to prepare the necessary documentation in accordance with current regulations

9 Matrix of competencies of the educational program “6B07205 - Mining Engineering”

Code	Name of discipline	General cultural									General professional										Professional																					
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
Mandatory component																																										
LNG 108	English	x		x		x	x	x	x																																	
LNG 104	Kazakh (Russian) language	x		x		x	x	x	x																																	
MAP 519	Geodesy											x										x						x														
PHY468	Physics I														x																											
MAT101	Mathematics I										x				x																											
GEN 177	Engineering and computer graphics											x	x	x										x																		
HUM 129	Culturology										x						x											x														
KFK 101	Physical education				x						x				x																											
HUM100	Modern history of Kazakhstan																																									
MAT102	Mathematics II										x				x																											
MIN 101	Mining Basics															x	x	x	x				x						x													
HUM 128	Political science						x					x											x																			
CHE 495	general chemistry																					x						x														x
HUM 132	Philosophy								x																																	
HUM 122	Psychology					x						x							x																							
MNG 487	Fundamentals of Entrepreneurship, Leadership and Anti-Corruption Culture				x	x											x						x																		
CHE 451	Life safety			x		x							x			x								x																	
MIN 109	Integrated information systems in mining													x	x		x	x		x						x		x														
GEO 475	Fundamentals of Geology															x	x	x			x		x																		
MIN442	Destruction of rocks by explosion															x	x	x	x	x	x		x	x				x	x												
CSE 677	Information and Communication Technologies (eng.)									x	x		x	x																												
HUM 127	Sociology			x			x				x								x			x																			
CHE 452	Ecology and sustainable development					x			x				x				x																								
MIN 443	Numerical 3D modeling of geomechanical processes															x	x	x	x	x																					
MIN 447	Rock physics															x	x	x	x	x	x		x																		
MIN 448	Construction of mining enterprises															x	x	x	x				x	x			x		x												
MIN 444	Datamine workbook															x	x	x	x																						

Code	Name of discipline	General cultural									General professional										Professional																		
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
2214	Elective																																						
ERG 554	Operation of electrical installations with voltage up to and above 100V														x	x	x		x																				
MIN 453	Open pit mining technology															x	x	x	x	x			x		x				x									
MET 179	Processing and beneficiation of minerals																	x				x																x
3217	Elective																																					
3218	Elective																																					
3303	Elective																																					
MIN 445	Financial and economic model of a mining enterprise															x	x	x	x	x					x	x			x									
MIN 458	Underground mining technology															x	x	x	x	x			x		x				x									
3221	Elective																																					
3304	Elective																																					
3305	Elective																																					
3222	Elective																																					
MIN481	Mining aerology																		x			x								x	x				x	x	
4307	Elective																																					
4308	Elective																																					
4309	Elective																																					
4310	Elective																																					
4311	Elective																																					
2214																																						
MIN449	Open pit mining processes															x	x	x	x				x			x			x									
MIN 450	Opening and preparation of deposits in underground mining															x	x	x	x	x			x			x			x									
MIN451	Opening and preparation of deposits in underground borehole leaching of uranium															x	x	x	x	x			x			x												
MIN 452	Industrial explosives																x	x					x					x	x					x			
MIN459	Mechanics of underground structures																x	x	x		x	x	x	x		x	x										
MAP530	General course of mine surveying																x	x	x				x				x										
3217																																						
MIN460	Interconnection and planning of open pit mining processes															x	x	x	x				x			x			x									
MIN454	Underground mining processes															x	x	x	x				x		x	x			x									

Code	Name of discipline	General cultural									General professional									Professional																	
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
MIN461	Geotechnology of underground mining of uranium deposits																x	x	x				x		x	x											
MIN462	Underground construction objects																x	x				x	x	x		x	x										
MAP529	Mine surveying drawing																x	x	x			x	x	x			x										
3218																																					
TEC 186	Mining and transport machines and equipment for quarries																x	x	x				x	x								x					
PED147	Mining and transport vehicles and equipment for underground mines																x	x	x				x	x								x					
MIN455	Shield tunneling complexes																x	x	x				x	x			x					x					
MAP 531	Mine surveying support of mining operations during the construction of mining enterprises																																				
MIN 466	Resource-saving and low-waste technologies in open pits																x	x	x				x			x											
MAP 531	Mine surveying of rocks during the construction of mining enterprises																																				
3303																																					
MIN463	Special methods of conducting open pit mining																x	x	x				x			x			x							x	
MIN464	Development and computer execution of mining development plans			x	x												x	x	x				x		x	x					x					
MIN465	Mining graphics for underground uranium mining			x	x												x	x	x				x		x	x					x					
MIN456	Tunnel construction technology																x	x	x		x		x	x		x	x									x	
MIN457	Methods for fixing underground structures																x	x	x				x	x		x	x										
MAP 520	Mine surveying and geodetic instruments																x	x					x	x													
3221																																					
MIN 466	Resource-saving and low-waste technologies in open pits			x	x												x	x	x				x		x	x					x					
MIN 467	Systems for underground mining of mineral deposits			x	x												x	x	x				x		x	x					x					
MIN 468	Hydraulics in uranium mining			x	x												x	x	x				x		x	x					x					
MIN 469	Construction technology of vertical mine workings			x	x												x	x	x				x		x	x					x					
MAP532	Mathematical processing of mine surveying and geodetic measurements			x	x												x	x	x				x			x										
3304																																					

Code	Name of discipline	General cultural									General professional									Professional																
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
MIN470	Technological complexes of open pit mining																x	x	x	x			x			x						x					
MIN 131	Ventilation of underground mines																x	x	x	x			x			x						x					
MIN471	Drilling and operation of geotechnical wells																x	x	x	x			x									x					
MI472	Calculation of the structure of underground structures																x	x	x			x	x	x		x	x										
MAP 528	Cartography and GIS in mining																																				
3305																																					
MIN473	Open pit mining of building rocks																x	x		x		x	x			x	x										
MI474	Technology and complex mechanization of underground mining																x	x		x			x	x		x						x					
MIN 475	Geotechnological field equipment for underground borehole leaching of uranium																x	x					x			x						x					
MIN 476	Design of construction of mining facilities																x	x		x			x	x		x	x			x							
MAP 521	Open-pit mine surveying																																				
3222																																					
MIN 477	Opening quarry fields																x	x	x	x			x			x											
MIN 478	Subsoil use contract and license																x	x					x			x					x		x	x			
MIN 479	Geotechnological methods for the development of solid minerals																x	x	x	x			x			x											
MIN 480	Special methods of construction of underground structures																x	x		x			x			x	x		x								
MAP 522	Mine surveying																																				
4307																																					
MIN482	Carrying out mine workings in open pits																x	x					x			x							x				
MIN483	Array state management									x	x						x	x			x	x						x									
MIN484	Field development in special conditions																x	x		x			x			x											
MIN 485	Special drilling and blasting operations																x	x					x			x			x								
MIN 486	Construction of underground hydraulic structures																x	x					x	x		x	x										
MAP524	Geomechanics																x	x					x	x													
4308																																					
MIN 487	Prospective and current planning of open pit mining																x	x		x			x			x				x			x				
MIN 488	Product quality management																x	x					x			x								x			
MIN 489	Technology and mechanization of stowing																x	x		x			x	x		x			x			x				

Code	Name of discipline	General cultural									General professional									Professional																		
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
	operations																																				
MIN490	Special methods for the development of uranium deposits																x	x		x			x			x											
MIN491	Blasting design																x	x	x	x			x			x			x	x			x			x	
MIN 492	Design of construction of underground mining enterprises																x	x	x	x			x	x		x				x			x			x	
MAP525	Mine surveying of underground mining systems																x	x					x														
	4309																																				
MIN 493	Reclamation of disturbed lands at mining enterprises									X						x	x	x					x			x					x				x		
xMIN 494	Design of underground mines						x						x					x			x				x			x			x				x	X	
MIN 501	Design of uranium deposits																	x	x				x			x				x		x		x		x	
MIN 495	Construction technology of horizontal and inclined mine workings													x				x						x			x				x	x					
MAP523	Subsoil geometry								x	x			x			x					x			x		x											
	4310																																				
MIN 496	Design of ore and coal pits									X						x	x	x					x			x					x				x		
MIN 497	Mine conservation						x						x					x			x				x			x			x				x	X	
MIN498	Conservation of uranium deposits																	x	x				x			x				x		x		x		x	
MIN 499	Reconstruction of mines and underground structures													x				x						x			x				x	x					
MAP527	Surveying software								x	x			x			x					x			x		x											
	4311																																				
MIN 500	Open pit mining systems															x	x		x			x			x												
MIN 441	Underground development of seam deposits															x	x	x	x			x			x			x	x			x			x		
MIN 432	Underground mining of primary and alluvial deposits															x	x	x	x			x	x		x				x			x			x		
MIN 433	Construction technology of urban underground structures																																				
MAP526	Mine surveying during the construction of tunnels																																				
	State final certification																																				
EC003	Preparation & writing of thesis (project)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x	x			

Code	Name of discipline	General cultural									General professional									Professional																				
		GCC -1	GCC -2	GCC -3	GCC -4	GCC -5	GCC -6	GCC -7	GCC -8	GCC -9	GPC -1	GPC -2	GPC -3	GPC -4	GPC -5	GPC -6	GPC -7	GPC -8	GPC -9	PC -1	PC -2	PC -3	PC -4	PC -5	PC -6	PC -7	PC -8	PC -9	PC -10	PC -11	PC -12	PC -13	PC -14	PC -15	PC -16	PC - 17	PC -18
ECA103	Thesis (project) defence																																							
Additional academic programes (AAP)																																								
AAP101	Physical education I, II																																							
AAP109	Internship																																							
AAP158	Industrial internship I																																							
AAP107	Sport Club																																							
AAP500	Military training																																							

10 Minor Continuing Education Policy

With the development of at least 12 credits in the disciplines of the program, including the following compulsory disciplines:

M1 - Crystallography and Mineralogy - 3 credits.

M2 - Petrography - 3 credits.

M3 - Structural Geology - 3 credits.

M4 - Geology of mineral deposits - 3 credits.

An additional Minor specialty “Applied Geology” is assigned with the issuance of an appendix to the diploma of the established sample

11 Appendices to ECTS standards

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. Purpose of filling

European application - the provision of sufficient data on 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. The application model, which will be used for the transfer of estimates, uses the European system of transfers or credit transfer (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, 6th level of the industry qualifications framework (OQF) with the right to work as Production Manager, 5-6 level - production engineer, technologist and 4 level - production shift master, dispatcher, senior dispatcher, quality engineer at the mining and metallurgical industry in accordance with the approved Protocol Meetings of industry commissions for social partnership and the regulation of social and labor relations for mining and metallurgy, chemical, construction industry and woodworking, light industry and ma inostroeniya on "16" August 2016 number 1.

SATBAYEV UNIVERSITY

Satbayev Uniuversity
СәтбаеваУниверситеті

DIPLOMA SUPPLEMENT
№ _____

This Diploma Supplement follows the model developed by the European Commission, 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 - judgements, 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)	
1.4	Student Identification Number	
2.	INFORMATION IDENTIFYING QUALIFICATION	
2.1	Title of Qualification and the Title Conferred	Bachelor in Technics and Technology. Level 6
2.2	Major	
2.3	Minor	
2.4	Name and Status of Awarding University in original language	Сәтбаев университеті
2.5	Name and Status of Awarding University in English	Satbayev Uniuversity
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
3.3	Access Requirements	
4	INFORMATION ON THE CONTENTS AND RESULTS GAINED	
4.1	Mode of Study	Full-Time
4.2	Program Requirements	129 credits of the Republic of Kazakhstan (240 ECTS credits), including General Studies – 30 (56 ECTS) credits, Basic Engineering Studies – 59 (110 ECTS) credits, Professional Studies – 40 (74 ECTS) credits, Elective Courses – 60 (112 ECTS) credits. Additionally, Practical Trainings – 6 (11 ECTS) credits, a Final Diploma Thesis – 3 (6 ECTS) credits
4.3	Program Details	*Attached in transcript of records*
4.4	Grading Scheme	

Evaluation	**GPA**	**Point %**	**Appreciation**
A	4	95-100	"Excellence"

			A-	3,67	90-94	"Excellence"
			B+	3,33	85-89	"Good"
			B	3	80-84	"Good"
			B-	2,67	75-79	"Good"
			C+	2,33	70-74	"Good"
			C	2	65-69	"Pass"
			C-	1,67	60-64	"Pass"
			D+	1,33	55-59	"Pass"
			D	1	50-54	"Pass"

5	INFORMATION ON THE FUNCTION OF THE QUALIFICATION	
5.1	Access to Further Study	Eligible for second-cycle higher education, graduate programs in master
5.2	Professional Status	Under legislation of the Republic of Kazakhstan, a person who was taken Bachelor in Technics is qualified for posts or positions in the industrial, public and scientific sectors for which the qualification requirement is a first higher education degree in major study. In some cases, the qualification requirement also includes the completion of studies in certain specified fields of minor study. The degree is also satisfied and corresponded to the Article 11 of the Directive of the European Parliament on the recognition of professional qualifications under level D of The European Union.
6	ADDITIONAL INFORMATION	
6.1	University Address	22 Satbayev Street, Almaty, 050013, Kazakhstan allnt@ntu.kzwww.satbayev.university
6.2	Further information source	http://edu.gov.kz/ru
7	CERTIFICATION OF THE SUPPLEMENT	
7.1	Place and Date	“____’ _____ 201__ Almaty, Kazakhstan
8	INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM	

The education system of the Republic of Kazakhstan consists of basic secondary education, general upper secondary education, vocational upper secondary education, higher education and graduate education. The basic education consists of a 9-year compulsory school for all children from 6 to 15 years of age.

Post-compulsory education is given by general upper secondary schools for 2 or 3 years and vocational upper-secondary institutions. The general upper secondary school provides a 2- or 3-years, at the end of which the pupil takes the Unite National Test (UNT) examination for 2-year study and the Matriculation examination for 3-year study. Vocational institutions provide 3-year programs, which lead to upper secondary vocational qualifications with further the Complex Test Attestation (CTA).

General eligibility for higher education is given by the UNT for a 4-year study, the Matriculation examination or the upper secondary vocational qualification with gained CTA results for a 3-year higher education.

Higher education studies are measured in credits. Study courses are qualified according to the workload required. One year of studies is equivalent to 1600 hours of student work on the average and is defined as 36 National credits or 60 ECTS credits. The credit system after recalculation complies fully with the European Credit Transfer and Accumulation System (ECTS)

8.1	University Degree	The Government Decree on University Degrees (GOSO/2016) defines the compulsory objectives, extent and overall structure of degrees. The universities decide on the detailed contents, curricula, forms of instruction and structure of the degrees they award.
8.1.1	First-Cycle (Bachelor)	The first-cycle university degree (Bachelor) consists of 99 (184 ECTS) credits for 3 years of full time study or 129 (240 ECTS) credits for 4 years. The degree is called Bachelor in Technics (Техникабакалавры) in all fields of study except Medicine and

		Architecture. The determined English translation for all the degrees corresponds to Bachelor of Science in the European countries and USA. Studies forwarding to the degree provide the student with: (1) functional knowledge of the fundamentals of the major and minor subjects or corresponding study entities or studies included in the degree program as well as the prerequisites for following study in the field; (2) functional knowledge and experimental skills needed for scientific thinking and the use of scientific methods for research needs; (3) functional knowledge and learning skills needed for studies leading to graduate university degrees and continuous learning; (4) professional skills and capacity for applying the acquired learnings to professional work at the field and beyond; (5) three-lingual language capacity (Kazakh / English / Russian) and communication skills. Studies forwarding to degree include at least General Studies – 30 (56 ECTS) credits, Basic Engineering Studies – 59 (110 ECTS) credits, Professional Studies – 40 (74 ECTS) credits, Elective Courses – 60 (112 ECTS) credits. Additionally, Practical Trainings – 6 (11 ECTS) credits, a Final Diploma Thesis – 3 (6 ECTS) credits
8.2.1	Second-Cycle (Master)	The second-cycle university degree (Master) consists at least 24 (45 ECTS) credits for 1-year full-time study, 36 (67 ECTS) credits for 1.5-years full-time study or 50 (93 ECTS) credits for 2-years full-time study. The degree is usually called Master in Technics or Master in Business Administration for 1 and 1.5-year full-time study; Master in Science for 2-years full-time study. The admission requirements for the second-cycle university degree (graduate) is a first-cycle university degree (undergraduate). General eligibility for the second-cycle education is given by a combination grade of the National Test of English Language unless an applicant has IELTS test results certified 6.0 overall and the Proficiency Examination, which is corresponding to GRE Subject Examination. Studies forwarding to the second-cycle university degree (Master) provide graduate with: (1) profound knowledge of the major subject or a corresponding entity and conversance with the fundamentals of the advanced studies in the field; (2) advanced knowledge and research skills needed to apply scientific knowledge and research approaches required for independent and demanding experimental work (dissertation); (3) good overall knowledge and professional skills in major field needed for operating as an expert and developer of the field; (4) scientific knowledge and interests needed for scientific (Doctoral) or postgraduate education devoted to cutting-edge science; (5) fluent professional English, communication and oral skills. Studies forwarding to degree include at least Intermediate Studies – 8 (15 ECTS) credits and Advanced Studies – 16 (30 ECTS) credits. Additionally, Internship improving expertise – 6 (11 ECTS) credits, a Final Dissertation Work – 6 (11 ECTS) credits
8.2	Doctoral Degree (PhD in Science)	Applicants can apply for doctoral (PhD) studies after the completion of a relevant second-cycle degree. General eligibility for PhD education is given by a combination grade of the National Test of English Language unless an applicant has IELTS test results certified 6.0 overall and the Proficiency Examination, which is corresponding to GRE Subject Examination, as well as at least 3 year research experience in the relevant field required. The aim of doctoral studies is to provide student with an in-depth, profound knowledge of their field of science through their scientific research and capabilities to produce novel scientific knowledge or solution independently. The Doctor's degree takes minimum 3 years to complete. An applicant who has been admitted to complete PhD Doctor's degree must take 12 (20 ECTS) credits of interdisciplinary study, show independent and critical thinking in the field of research and write PhD dissertation to defend in public

12 Short description

English
CODE - LNG108
CREDIT – 5 (0/0/6)
PREREQUISITE - Diagnostic Test / LNG1051-1056

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 improve his skills at the next stage of learning English.

Post requisites of the course: Elementary English.

Kazakh / Russian language
CODE – LNG 104
CREDIT - 5 (0/0/3)
PREREQUISITE - Diagnostic Test

GOAL AND OBJECTIVES OF THE COURSE

- To teach students to listen to statements on well-known topics related to home, study, free time;
- understand texts on personal and professional topics containing the most frequent words and phrases;
- be able to conduct a conversation on everyday topics; describe your experiences; tell your opinion; retell and evaluate the content of the book you’ve read, the movie you’ve seen;
- Be able to create simple texts on known topics, including those related to professional activities.

SHORT DESCRIPTION OF THE COURSE

The language material of the course is selected in such a way that the student, while assimilating the lexical and grammatical minimum, has the opportunity to get acquainted with typical communicative situations and he himself finds himself in such situations, is able to correctly evaluate them and choose the appropriate model (strategy) of speech behavior.

The main emphasis of training is shifted from the process of transferring knowledge to teaching the ability to use the studied language in the course of the implementation of various types of speech activity, such as reading (assuming reading comprehension), listening (under the same condition) and producing texts of

a certain complexity with a certain degree of grammatical and lexical correctness.

The material for the classes is selected so that students learning Kazakh/ Russian acquire the skills of reading, writing and understanding sounding speech based on the simultaneous mastery of the basics of grammar (phonetics, morphology and syntax) and word usage during constant repeated repetition with the gradual complication of tasks.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student, subject to the active organization of work in the classroom and conscientious fulfillment of homework at the end of the first semester, acquires skills corresponding to the pan-European level A2 (Threshold according to ALTE classification), that is, he is on the verge of independent language proficiency.

Geodesy

CODE - MAP 519

CREDIT - 5 (1/0/2)

PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the course is to familiarize students with science, which studies the shape and size of the Earth’s surface or its individual sections through measurements, in the mathematical processing of measurements with the construction of maps, plans used to solve engineering, cadastral and other problems. The study is based on methods for determining geometric proportions, sizes and the location of the most significant objects, in relation to each other using modern equipment and technology.

The objectives of the course - the formation of practical and applied skills:

- in angular and linear measurements by optical-mechanical and electronic geodetic instruments;
- 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 processed data on the plan or in the profile.

SHORT DESCRIPTION OF THE COURSE

The course contains a training program that gives basic concepts about the shape and size of the Earth, about coordinate systems used in geodesy, about orienting lines on terrain, about plans, maps, profiles, about scale, about terrain, about angular and linear measurements, about different high-altitude shooting. The course is designed in such a way as to teach the student not only basic concepts, but also to teach how to carry out field work of various horizontal and vertical surveys,

process field measurements of various horizontal and vertical surveys, to build and execute a plan or profile when solving engineering problems using engineering and technology, in accordance with the requirements of the labor market.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student will know:

- device basic geodetic instruments,
- a technique for performing angular, linear and altitude measurements on the earth's surface,
- rules for desk processing of geodetic measurements,
- basic requirements for the preparation of topographic documentation.

The student will be able to:

- work with geodetic instruments when performing angular, linear and altitude measurements on the ground,
- perform basic geodetic surveys,
- perform calculation and graphic work when processing the results of geodetic measurements
- solve engineering problems according to plans, maps and profiles.

Physics

CODE – PHY 468

CREDIT - 5 (1/1/1)

PREREQUISITE - Diagnostic Test / PHYS110-111

GOAL AND OBJECTIVES OF THE COURSE

The main purpose of teaching the Physics I and Physics II courses is to form ideas about the modern physical picture of the world and the scientific worldview.

SHORT DESCRIPTION OF THE COURSE

The disciplines of Physics I and Physics II are the basis of theoretical preparation for the 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 1" includes sections: the physical foundations of mechanics, the structure of matter and thermodynamics, electrostatics and electrodynamics. The discipline "Physics II" is a logical continuation of the study of the discipline "Physics 1", and forms a holistic view of the course of general physics as one of the basic components of the general theoretical training of bachelors in engineering. The discipline "Physics II" includes sections: magnetism, optics, nanostructures, the basics of quantum physics, atomic and nuclear physics.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF 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 system of professional activity.

Math I
CODE – MAT101
CREDIT - 5 (1/0/2)
REQUISITES - Elementary mathematics-school course / diagnostic test

GOAL AND OBJECTIVES OF THE COURSE

The main goal of the course is to give a future specialist a certain amount of knowledge on the sections of the course "Mathematics-I", necessary for the study of related engineering disciplines. To introduce students to the ideas and concepts of mathematical analysis. 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:

the acquisition of knowledge necessary for the effective use of rapidly developing mathematical methods; gaining the skill of building and researching mathematical models; knowledge of the fundamental areas of mathematics necessary for solving research and practical problems in the professional field.

SHORT DESCRIPTION OF THE COURSE

The course "Mathematics-I" gives an account of the sections: an introduction to analysis, differential and integral calculus

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Studying this discipline will allow the student to apply the course “Mathematics-I” to solve simple practical problems, find tools sufficient for their research, and get numerical results in some standard situations.

Engineering and computer graphics
CODE - GEN 177
CREDIT - 5 (1/1/1)
PRE-REQUISIT - no

PURPOSE AND OBJECTIVES OF THE COURSE

Discipline is a must. The course develops the following skills among students: to depict all kinds of combinations of geometric shapes on a plane, to carry out research and their measurements, allowing the transformation of images; create technical drawings, which are the main and reliable means of information that provides communication between the designer and the designer, technologist, builder. Introduces students to the basics of automated preparation of the graphic

part of design documents in the AutoCAD environment.

Cultural studies
CODE - HUM129
CREDIT - 2 (1/0/0)
PREREQUISITE - no

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the course: to form undergraduate students' 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, the ability in independent professional activity to carry out a strategy for preserving the cultural heritage of the Kazakh people in a dynamically changing multicultural world and society.

Course objectives:

- to describe the morphology and anatomy of culture as a system of parameters and forms in the contexts:

- nature, man, society;

- to 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;

- to organize information about the cultural heritage of the inhabitants of Kazakhstan and to determine the channels of their influence on the formation of the culture of the Kazakh people;

- to classify the cultural capital of the Turks, to organize 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;

- provide reasoned and reasonable information about the various stages of the development of Kazakh culture as a factor in the preservation of cultural heritage and the Kazakh language, including modern state programs for its development and modernization;

- to give an objective assessment of the national.

BRIEF DESCRIPTION OF THE COURSE

The course is intended for students of the EP «Cultural Studies» aimed at the development of a socio-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, SKILLS AT THE END OF THE COURSE

As part of the course, the student will master the practical use of methods of cultural studies in various aspects of life. The 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 organize 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;
- provide reasoned and reasonable information about the various stages of the development of Kazakh culture as a factor in the preservation of cultural heritage and the Kazakh language, including modern state programs for its development and modernization.

Physical education

CODE – KFK 101,102,103,104

CREDIT - 2 (0/0/2)

The course is intended for 1.2 year students of all specialties.

As part of the course, the student will master the practical use of the skills of performing the basic elements of the technique of athletics, sports games, gymnastics and a set of standards for general physical training, including vocationally applied physical training or one of the sports, methods of conducting independent physical exercises.

Basic knowledge and skills in the field of physical culture and sports, as well as methods of building and normalizing the load during independent studies will be presented; methodology for compiling hygienic gymnastics complexes and general developmental exercises;

The final stage of the course is a multivariate test and / or fulfillment of the established standards for general physical, sports and professional applied training.

After completing the course, the student must understand the role of physical culture and a healthy lifestyle; know the basics of physical education and a healthy lifestyle; possess a system of practical skills and abilities that ensure the preservation and strengthening of health, the development and improvement of psychomotor abilities and qualities.

The student should be able to:

- to dose the load during health-improving and independent physical exercises;
- evaluate the volume and intensity of physical activity, taking into account age and health status;
- use the methods and means of PPFP;
- use a set of exercises for general physical training, SFP and include sports and outdoor games, national games.

At the end of the course, the student should know:

- the purpose and objectives of physical training;
- the content of training sessions;
- the rules for constructing and standardizing the load during independent studies; - rules and methodology for compiling hygienic gymnastics complexes and general developmental exercises;
- focus of professionally applied physical training;
- sets of exercises on GPP, SPP and the content of games used in practical classes.

The modern history of Kazakhstan

CODE - HUM100

CREDIT -5 (1/0/2)

PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE

The aim of the course is to familiarize students of technical specialties with the main theoretical and practical achievemen

ts of domestic historical science on the problems of the history of modern Kazakhstan, an integrated 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;
- 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 citizenship of students;
- educate students in the spirit of patriotism and tolerance, ownership of their people, the Fatherland;

SHORT 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 is studying the national liberation movement of the Kazakh intelligentsia at the beginning of the 20th century, the period of the

creation of the Kazakh Autonomous Soviet Socialist Republic, and the process of formation of a multinational society.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF 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 Kazakh statehood;
- the ability to analyze complex historical events and predict their further development;
- the ability to work with all kinds of historical sources;
- the ability to write essays and scientific articles on the history of the Fatherland;
- the ability to operate with historical concepts;
- ability to lead a discussion;
- skills of independent analysis of historical facts, events and phenomena;
- public speaking skills.

Math II

CODE – MAT102

CREDIT -5 (1/0/2)

PREREQUISITE - Mathematics 1

GOAL AND OBJECTIVES OF THE COURSE

The purpose of teaching the course "Mathematics II" is the formation of 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 an almost acceptable result. To develop primary skills in mathematical research of applied issues and the ability to independently understand the mathematical apparatus contained in the literature related to the student’s specialty.

SHORT DESCRIPTION OF THE COURSE

The course "Mathematics II" provides an accessible presentation of the 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, SKILLS FOR COMPLETION OF THE COURSE

Studying this discipline will make it possible to put into practice the theoretical knowledge and skills obtained with a high degree of understanding of the sections of the course, to 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

Basics of mining (Introduction to the specialty)
CODE - MIN 101
CREDIT - 5 (1/0/2)
PREREQUISITE

GOAL AND OBJECTIVES OF THE COURSE

Mastering mining terminology, mastering the principles of mining operations in open, underground and borehole mining of mineral deposits, the basic concepts of mineral processing.

SHORT DESCRIPTION OF THE COURSE

Basic information about mining. The main production processes in the development of deposits by open, underground methods and in borehole mining. Types and types of mining machinery and equipment used in mining. Methods of preparing rocks for excavation, excavation, shipping, delivery methods of moving rocks and dumping. Basics of underwater mining and mineral processing.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: General information about the mining properties of rocks. Methods of destruction of rocks. The main production processes of mining. Features of the movement of rock mass in mining enterprises by various vehicles. Basic concepts of mineral processing (averaging, crushing, grinding, gravity, flotation, magnetic separation, etc.).

Political Science
CODE - HUM128
CREDIT - 2 (1/0/0)
PREREQUISITE – no

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the course is the political socialization of students of the Technical University, ensuring the political aspect of training a highly qualified specialist on the basis of modern world and domestic political thought.

The aim of the course is to give the future specialist primary political knowledge that will serve as a theoretical basis for understanding political processes, for the formation of political culture, developing a personal position and a clearer understanding of the measure of their responsibility.

BRIEF DESCRIPTION OF THE COURSE

The course of political science is designed to introduce students to the basics of political science and

form a general idea of politics, its main aspects, problems,

patterns and interaction with other spheres of public life.

KNOWLEDGE, SKILLS, SKILLS AT THE END OF THE COURSE

At the end of the course, the student should know:

- basic conceptual apparatus of political science;
- basic methodological approaches and paradigms of political science
- the 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 the cross-country 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 current problems of modern society, the essence of social processes and relationships.

General chemistry

CODE – CHE495

CREDIT - 5 (1/1/1)

PREREQUISITE - Diagnostic Test

GOAL AND OBJECTIVES OF THE COURSE

Course objective: Formation of knowledge on fundamental issues of general chemistry and skills of their application in professional activities.

Course Objective:

• transfer the basic theoretical knowledge of the course of chemistry;
• help students gain lab skills;
• to teach to solve typical problems and to write the equations of reactions;
which contributes to the informal assimilation of theoretical material;
• to form students' chemical thinking skills.

SHORT DESCRIPTION OF THE COURSE

The course “General Chemistry” considers the laws, theoretical principles 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, SKILLS FOR COMPLETION OF THE COURSE

As a result of mastering the discipline, students should

1) know:

• basic chemical laws and concepts,

• various chemical systems,

• basic laws of chemical reactions,

• 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 down the reaction equations,

• make calculations using basic chemical laws.

3. own skills:

- navigate the basic concepts of chemistry, the properties of non-metal elements and metals of the groups of the periodic system;

- to acquire skills in drawing up 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 take place.

Philosophy

CODE – HUM132

CREDIT - 5 (1/0/2)

PREREQUISITE - HUM100 Modern History of Kazakhstan

GOAL AND OBJECTIVES OF THE COURSE

The aim of the course is the formation of cognitive, operational, communicative, self-educational competencies

to solve problems:

- contribute to the development of adequate worldview guidelines in the modern world;

- to form creative and critical thinking among students;

- distinguish the ratio of spiritual and material values, their role in the life of a person, society and civilization;

- contribute to the determination of their attitude to life and the search for harmony with the outside world.

SHORT DESCRIPTION OF THE COURSE

"Philosophy" is the formation of a holistic worldview, which developed in the context of the socio-historical and cultural development of mankind. Acquaintance

with the main paradigms of the methodology of teaching philosophy and education in the classical and post-classical traditions of philosophy. Philosophy is called upon to develop sustainable life guidelines, acquiring the meaning of one's being as a special form of spiritual production. It contributes to the formation of the moral character of the personality with the ability to critical and creative thinking. The theoretical sources of this course are the concepts of Western, Russian, Kazakhstani scientists on the history and theory of philosophy.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- knowledge of basic terms, main concepts and problems of philosophy;
- knowledge of the basic philosophical methods of solving worldview issues in the context of culture;
- the ability to analyze the history of the development of philosophical thought;
- the ability to determine alternative ways of posing and resolving worldview issues in the history of human development;
- the ability to identify the main theoretical approaches in the relationship of man with society;
- the ability to master the technique of independent work;
- skills to search for systematization of material;
- skills to freely discuss and make rational decisions;
- skills of ethical principles in professional activities.

Psychology

CODE - HUM122

CREDIT - 2 (1/0/0)

PRE-REQUISIT – no

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the discipline is the formation of psychological knowledge, skills and competencies necessary in professional activity; development of students' psychological thinking and systematization of their knowledge based on the study of general psychological laws.

Objectives of mastering the discipline:

1) mastering basic psychological concepts, theories and approaches to the study of personality and society;

2) the formation of ideas about the basic principles of the functioning of socio-psychological phenomena, psychological patterns of age and cultural socialization of a person, factors of his learning and cognitive development;

3) instilling the skills of using the knowledge gained in the process of mastering psychology in professional activity.

4) to develop the skills and abilities of analytical and research thinking,

creative development of the content of psychological sources of foreign and domestic authors and methods of obtaining psychological information;

5) the formation of critical thinking skills and the ability to apply it in practice.

BRIEF DESCRIPTION OF THE COURSE

The discipline "Psychology" examines the patterns of the emergence, development and functioning of mental processes, states, personality traits involved in this or that activity, the patterns of development and functioning of the psyche as a special form of life. The study of this discipline is aimed at the formation of psychological culture, worldview, self-awareness, psychological thinking of the individual for social and professional interaction.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

As a result of studying the discipline, the student must:

know:

- characterization of psychology as a science, its methods, tasks and history of development;
- the essence and structure of the emergence and development of the psyche and mental phenomena, taking into account the age and social characteristics of manifestation;
- general psychological patterns of development of psychological phenomena;
- knowledge of the psychological laws of communication and interaction of people;
- the dynamics of development and structure of personality and human activity;

be able to:

- understand and explain the need for psychological and socio-psychological knowledge in professional activities;
- to analyze the main categories of psychology, interpersonal relationships in a group, the characteristics of the activities of various individuals;
- to apply psychological knowledge as a means of self-knowledge and self-development;
- to design effective methods of work in various spheres of social communication based on the content of psychological theories and ideas;

own:

- skills of argumentation, focused on achieving high results of educational and professional activities.
- the ability to work in a team, correctly defend one's point of view, propose new solutions, find compromises;
- skills of systemic thinking and holistic perception of psychological reality;
- the ability to analyze and form judgments about the psychological problems of a person in the modern conditions of the development of society.

Fundamentals of Entrepreneurship, leadership and anti-corruption culture

CODE – MNG 487
CREDIT – 3 (1/0/1)
PRE-REQUISIT - no

The discipline is aimed at forming students' organizational and legal form of the enterprise based on the goals of the enterprise and the specifics of the organization and functioning of enterprises in various forms; to assess the effectiveness of entrepreneurial activity; to assess external and internal risks for the enterprise; to develop business plans taking into account regulatory, resource, administrative and other conditions. Set goals and formulate tasks related to the implementation of professional functions. Organize team interaction to solve management tasks. Diagnose organizational culture, identify its strengths and weaknesses, develop proposals for its improvement. Develop measures to motivate and stimulate the organization's staff.

Life safety

CODE – CHE451
CREDIT 1 (1/0/0/0)
PREREQUISITES: none

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the discipline: to study the impact of anthropogenic hazards and risks in the conditions of new realities that disrupt the normal functioning of people, causing accidents, leading to emergencies and catastrophes, including environmental ones. To instill the skills to identify these dangers and master the prevention measures or the principles of protection against them.

SHORT COURSE DESCRIPTION

Life safety is concerned with the identification of hazards and risks that affect human health and life. Life safety gives an idea of the inseparable unity of effective professional activity with the requirements for human safety and security. Life safety includes the study of the basic principles of ensuring the safety of human interaction with his environment; rational and safe conditions of his activity; the consequences of human exposure to traumatic, harmful and damaging factors; means and methods of improving safety, environmental friendliness and sustainability of technical means and technological processes.

KNOWLEDGE, SKILLS, SKILLS AT THE END OF THE COURSE

Familiarization of students with the control of parameters and the level of negative impacts on their compliance with regulatory requirements; effective use of

protective equipment against negative impacts; development of measures to improve the safety and environmental friendliness of production activities; planning and implementation of measures to protect production personnel and the public.

Integrated information systems in mining
CODE - MIN109
CREDIT - 5 (1/2/0)
PREREQUISITE - MIN101

PURPOSE AND OBJECTIVES OF THE COURSE. As part of the course, the student will master the practical use of information systems for design in the development of minerals.

Basic knowledge and skills in the use of computer-aided design technology and information systems in the development of mineral deposits, for independent practice, as well as methods for planning open-pit and underground mining will be presented.

THE FINAL STAGE OF THE COURSE IS THE EXAM.

After completing the course, the student must demonstrate efficiency in calculation, analysis, synthesis and design, as well as distinguish between software systems.

THE STUDENT SHOULD BE ABLE TO: select software for solving production issues. Select commercially available equipment by calculation. To make a technical and economic assessment of the accepted schemes of open-pit and underground mining. At the end of the course, the student should know: modern complexes designed for solving problems in the field of mining, their features, methods of work (calculation, analysis, design, etc.), the properties of software, technical and economic indicators of the information complex.

The basics of geology
CODE – GEO 475
CREDIT - 5 (2/1/0)
PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the discipline is to study the structure, material composition of the Earth and the earth's crust; geodynamic processes that form the relief and structure of the earth's crust; minerals and mineral exploration methods; engineering and geological conditions of mineral deposits; readiness of mineral deposits for development.

The objective of the course: 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 of their study, the basic structures of the earth's crust.

SHORT DESCRIPTION OF THE COURSE

The course "Fundamentals of 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 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; ways to represent them on geological maps and sections, the concept of a geochronological (stratigraphic) scale.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of mastering the discipline, students should

1) to know: the internal structure of the Earth, the geological activity of the main factors of its external and internal dynamics, the occurrence of geological bodies, tectonic movements and methods for studying them, types of structures of the tecton 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; construction of geological maps of simple structure and geological sections; reading simple geological maps.

Rock destruction

CODE – MIN442

CREDIT- 5 (1/1/1)

PREREQUISITE – MIN 101

GOAL AND OBJECTIVES OF THE COURSE

Training of specialists in the field of explosives, their acquisition of the necessary skills for independent practical activities.

The task of studying the discipline is the study of modern explosives (BB) and means of initiation; blasting methods in mining and construction of underground structures.

SHORT DESCRIPTION OF THE COURSE

Drilling holes and boreholes, the fundamentals of the theory of explosion and detonation of explosive charges, methods for evaluating the efficiency and quality of industrial explosives, industrial explosives, means and methods of initiating industrial

explosives, the destructive, seismic and airborne effects of an explosion, the destruction of rocks by explosion, the destruction of rocks during sinking mining, industrial safety requirements for blasting.

KNOWLEDGE KNOWLEDGE, SKILLS FOR COMPLETING THE COURSE: after completing the course, the student will master the knowledge on the use and safe handling of industrial explosives, independently draw up projects and passports for blasting operations.

The student should know: the properties and scope of industrial explosives used in the mining industry; means and methods of detonating explosive charges; industrial safety requirements for blasting.

The student should be able to: determine the basic design characteristics of explosives and the basic properties of explosives, design blasting operations in the mining industry; count electric blasting networks; use explosive devices and machines, instrumentation; experience industrial explosives; to carry out blasting operations during underground operations.

Information and communications technology (English)

CODE – CSE 677

CREDIT - 5 (2/1/0)

PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE

- Training in the use of modern information technologies in the field of professional activity. The objectives of the course 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 a variety of representations, both tabular structured and unstructured;

- To teach to apply the basic principles of information security;

- Expand the concepts of data formats and multimedia content. Learn to work with typical multimedia data processing applications. Use modern approaches to presenting material;

- To reveal the concepts of modern social, cloud and email platforms and how to work with them;

- To teach how to use the methods of algorithmization and programming to solve tasks of automating business processes

SHORT 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 GOSO Model Curriculum, with a predominance of educating 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 to teach how to use these tools to solve applied problems. To teach you 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, SKILLS FOR COMPLETION OF THE COURSE

Students will know:

- Computer device;
- Architecture of computer systems;
- 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 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 for organizing business processes;
- Program in an algorithmic programming language;
- Analyze, model, design, implement, test and evaluate information and communication technology systems

Sociology

CODE - HUM127

CREDIT - 2 (1/0/0)

PRE-REQUISIT – 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 about existing sociological theories explaining social phenomena and processes.

Objectives of mastering the discipline:

- 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 effective professional activity of a future specialist, which is impossible in modern society without understanding social processes, as well as without mastering the skills of their correct interpretation.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE 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;

• basic 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 regularities 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 features of their application;

be able to:

• describe the processes and observed phenomena occurring in society using sociological terminology;

• explain differences in approaches to defining 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;

• the skills of independent individual preparation, constructive communication

and the performance of appropriate roles in the implementation of group projects, participation in the discussion;

• presentation of the results of individual and group analytical work in written and oral form;

• skills of academic and grammatically correct writing, text structuring, processing of sources, design of the reference apparatus.

Environmental and the Sustainable development

CODE – CHE 452

CREDIT - 2 (1/0/0)

PRE-REQUISIT – no

PURPOSE AND OBJECTIVES OF THE COURSE

Purpose of the course: Formation of knowledge on global environmental problems of our time and ways of achieving sustainable development for mankind, to provide knowledge about the biosphere capacity of the economic development of civilization, the principles and methods of achieving sustainable development for mankind

Objective of the course:

- to understand the reasons for the origin and development of environmental problems of our time;

- to master a system-integrated approach in solving environmental problems of our time;

- to acquire practical skills in the development and implementation of long-term environmental programs for the sustainable development of civilization.

BRIEF DESCRIPTION OF THE COURSE

The subject of study is the biosphere, a unified system with numerous synergistic effects with unique properties that explain its function and role in supporting life on Earth. The biosphere is open to other spheres and exchanges matter, energy and information with other spheres. However, the huge and steadily increasing impact of human activities on the biosphere has reached a level where human activities have a significant impact on global cycles and flows, in the form of climate change, pollution, catastrophic depletion of biodiversity on Earth and other global problems of our time. Solutions to these problems are spelled out for sustainable development.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

KNOW:

- Assessment of the state of the environment during global changes;

- the main stages of the development of civilization and environmental crises characteristic of each of them;

- principles of respect for nature and sustainable development of civilization;
- methodology for conducting field and laboratory environmental studies.

BE ABLE TO:

- analyze ecological processes and phenomena;
- to form an ecological worldview based on the use of the provisions of the concept of sustainable development.

OWN SKILLS:

- assessment of the state of the environment and human activities;
- analysis of the main stages of the development of civilization from the point of view of global ecology;
- acquisition of practical skills for adaptation and achieving sustainable development in the context of global changes.

Numerical 3D simulation of geomechanical processes

CODE – MIN 443

CREDITS - 5 (1/0/2)

PREREQUISITE – MIN 439 Integrated information systems in mining

PURPOSE AND OBJECTIVES OF THE COURSE. The aim of the discipline is to master modern numerical methods of solid mechanics to determine the stress-strain state of mining and technical objects and to assess their stability. The objectives of the course include: studying the basic relationships of rock and soil mechanics; the use of a numerical method (finite element method) to solve the problem of the rock mass stress-strain state, implementation of rock (soil) deformation models, strength and stability criteria depending on targets and the object being modeled.

BRIEF COURSE DESCRIPTION. Types of a solid stress state ; the relationship between stresses, strains and displacements; algorithm of the finite element method, numerical implementation of the main tasks of geomechanics, the concept of elastic and elastic-plastic model of the medium, strength criteria and their implementation in a digital model, assessment of the stability of geotechnical objects based on the three-dimensional stress-strain state of a rock or soil mass.

KNOWLEDGE, ABILITY, SKILLS FOR COMPLETION OF THE COURSE. As a result of studying the course, students will gain knowledge on modeling the stress-strain state of rocks and soils. The practical interpretation of the course will develop the ability to study geomechanical processes based on a three-dimensional numerical model of the object, take into account the mining and geological features of the environment, assess the stability of the object and the risks related to adverse factors.

The student should know: the basic relationships of solid mechanics, the algorithm of the numerical method and its implementation in the licensed software

RS3 (Rocscience), the principles of modeling the features of a geotechnical object, the principles of assessing the stability of geotechnical objects.

The student must be able: to perform geomechanical calculations using licensed software, interpret the results of 3D modeling, draw conclusions about the stable / unstable state of the object.

Rock physics

CODE– MIN 447

CREDIT - 5 (1/0/2)

PREREQUISITE – MIN 101

GOAL AND OBJECTIVES OF THE COURSE

Mastering by students of the essence of the physical and mechanical properties of rocks and processes formed during mining operations.

SHORT DESCRIPTION OF THE COURSE

Physical properties, phenomena and processes occurring in rocks during mining, processing and processing of minerals.

The essence, quantitative and qualitative characteristics of the physical and technical parameters of the rocks, their dependence on the composition and structure of the rocks, variability from the effects of external physical fields, methods for their measurement, as well as the values and application of the properties of the rocks in solving practical problems of studying the field and mining the creation of new technological methods, methods and mechanisms for mining. Quantitative and qualitative characteristics of the physical and technical parameters of rocks. Structural, mechanical and physical features of rock masses.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: the physical condition of the rocks in the massif; main mining and technological parameters of rocks.

The student should be able to: determine the most important physical and technical parameters of rocks; to distinguish between the physical nature of various processes occurring in rocks.

Construction of mining enterprises

CODE – MIN 448

CREDIT - 5 (1/1/1)

PREREQUISITE – MIN 101

COURSE PURPOSE AND OBJECTIVES:

Training of specialists for production and technological activities and design work in the field of design and construction of mining enterprises.

The objective of the discipline is to study the construction technology of mining enterprises, underground facilities and their structures.

SHORT DESCRIPTION OF THE COURSE

Classification of underground structures, rock pressure on the support of vertical, horizontal mining and inclined mine workings, support of horizontal mine workings, the basis for calculating supports and lining of horizontal workings, the choice of the type of support and determination of the cross-sectional dimensions of horizontal workings, mine shaft trunks, circular mine shaft trunks , workings and chambers, transport tunnels. metro facilities, underground hydroelectric power stations.

KNOWLEDGE KNOWLEDGE, SKILLS FOR COMPLETION OF THE COURSE:

After completing the course, the student will master the knowledge of the rationale for effective technology for the construction of mining enterprises, independently draw up projects for the construction of mining enterprises.

The student should know: technologies for the construction of underground facilities of mining enterprises, urban underground facilities, transport tunnels and other underground special structures.

The student should be able to: choose appropriate schemes for the construction of underground facilities, determine the load on the bearing elements of their lining, solve specific engineering problems associated with the design of underground structures.

Datamine Workbook

CODE – MIN 444

CREDIT - 5 (1/1/1)

PREREQUISITE – MIN 109 Integrated information systems in mining

COURSE PURPOSE AND OBJECTIVES:

The purpose of the course is to master the basics of Datamine software products for the design of open and underground mining operations. The objectives of the course are: familiarization with the interface; creation of frame models and toposurface; analysis of block models; creation of a quarry and underground mining; development of a mining schedule.

The course is devoted to the study of the integrated Datamine information system, which includes the capabilities of the program, its initial settings, functions and operations on objects, design of open and underground mining, block model analysis and calendar planning.

The student should know:

- the composition of the Datamine software package and its capabilities;
- the procedure for compiling block models and their analysis;
- fundamentals of Datamine software products in field design.

The student should be able to:

- to calculate and analyze the main parameters of the mine using office and special programs;
- build and analyze wireframe models;
- use the basic skills of the special Datamine software.

Open pit mining processes

CODE - MIN 449

CREDIT - 5 (1/0/2)

REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The formation of students' knowledge of the basic processes of mining: preparing rocks for excavation; stripping and mining operations; transportation of overburden and minerals; dumping and reclamation.

SHORT DESCRIPTION OF THE COURSE

General information about the properties of rocks and opencast mining. Technological processes in quarries: preparing rocks for excavation, excavation and loading operations, open cast mining using bulldozers and scrapers, transporting rock mass, overburden dumping, reclamation methods.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: physical and mechanical properties of rocks; equipment and technology for preparing minerals for excavation, technological and physicotechnical foundations of excavation and loading operations; technological characteristics of various types of mining transport, methods of dumping and reclamation.

Underground and field preparation during underground mining

CODE – MIN450

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the discipline "Opening and preparation of deposits" is the acquisition by students of the complex of necessary knowledge of the theoretical foundations and practical skills in opening and preparing ore deposits.

The objectives of the course is the acquisition by students of the complex of

necessary knowledge on the opening and preparation of the mine field during underground mining of solid mineral deposits.

SHORT DESCRIPTION OF THE COURSE

The opening of mineral deposits is the development of openings that provide access from the earth's surface to the field, for its development. In accordance with the program of this course, special attention will be paid to questions of methods of opening and preparation, for mining operations, determining the parameters of mines - the annual production capacity and size of mine fields.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- know the main and auxiliary processes,
- be able to calculate the main processes.
- be able to apply the main and auxiliary processes depending on the geological and mining conditions of the field.
- be able to choose rational methods of opening and preparation of ore deposits.

Opening and preparation of deposits during underground borehole leaching of uranium

CODE – MIN451

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of teaching the course is the acquisition of theoretical foundations and practical skills in discovering and preparing deposits during underground downhole leaching of uranium.

The objectives of the course is the acquisition by students of the complex of necessary knowledge on the opening and preparation of mining blocks during underground downhole leaching of uranium.

SHORT DESCRIPTION OF THE COURSE

Boreholes and their fastenings, preparation for daytime surface installation work (pipeline networks, pumps, compressors, etc.), preparation of chemical solutions, construction of workshops for processing productive solutions.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

In the process of studying the discipline, the student must learn the basics of uranium leaching, the hydrodynamics of solutions, the basic chemical reactions of leaching of uranium, strapping blocks, grid location of wells, types of wells with PSV.

Industrial Explosives
CODE - MIN452
CREDIT - 5 (2/0/1)
PREREQUISITE: MIN1463 Destruction of rocks by explosion

The purpose of the discipline is to study the types and classification of industrial explosives used in the destruction of rock massifs and solid minerals, the composition of components of industrial explosives, the conditions of their use and the choice of explosives.

Summary: Classification of explosives, nitroglycerin explosives (dynamites), ammonium nitrate explosives, etc. Properties and scope of industrial explosives used in the mining industry; the main components of industrial explosives; explosion theory and thermodynamics of the explosive process; methods of preparation of the simplest explosives. The use of mixed explosives; the dialectic of means of detonation: fire-conducting and detonating cords, electric detonation, the use of waveguides for the transmission of detonation, electronic (radio-controlled) detonation. Fundamentals of explosion theory, methods for evaluating the effectiveness and quality of industrial explosives, regulation of the degree of crushing of borehole and borehole charges. Requirements for the quality of the explosion, the degree of crushing of rocks by explosion and methods of its determination, the calculated specific consumption of explosives, the design of the charge. The impact of slaughtering on the efficiency of blasting, Mechanization of blasting operations. Safety of blasting operations and the main measures to ensure it.

Expected results: as a result of mastering the discipline, the student in-depth masters the types of industrial explosives and their main characteristics, the component compositions of industrial explosives, and the student will also learn how to choose explosives correctly, work safely with industrial explosives.

The mechanics of underground structures
CODE –MIN459
CREDIT - 5 (2/0/1)
REQUISITES - MIN 447

GOAL AND OBJECTIVES OF THE COURSE: the acquisition by students of the skills, knowledge and skills necessary for independent creative solving problems of assessing the interaction of an underground structure with a host rock mass, analyzing the stress-strain state of the structure-rock mass system, its strength and stability.

SHORT DESCRIPTION OF THE COURSE

The discipline considers the physicomechanical properties of rocky and rock-

free rock masses (soils) and mechanical processes in rock massifs that arise as a result of a violation of their natural stress-strain state during mining and construction works, patterns of behavior of rock outcrops and loose workings. Determination of mechanical characteristics of the enclosing array. The methods for calculating their strength and stability, taking into account the specifics of their interaction with the rock mass.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, students know the processes occurring in the rock mass, both when its deformed state changes and when the rock mass is destroyed, it knows how to analyze geomechanical processes in rock masses, and it can determine the stress-strain state of an underground structure and its enclosing mass with using field studies and calculations. He has the skills to objectively evaluate the results of calculations of the interaction of underground structures with a rock mass.

The student should know: physical and mechanical properties of rock massifs and their structural and mechanical features; mechanical processes in massifs of rocks arising as a result of violation of their natural stress-strain state during mining and construction works; patterns of behavior of pedigree outcrops and loose workings; constructions of supports and lining.

The student should be able to: build passports of volumetric strength of rocks and the strength of the output circuit, determine the stress in the array around the output, calculate the load on the lining and lining.

General course of surveying

CODE - MAP 530

CREDIT - 5 (1/0/2)

REQUISITES - MAR 519

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the course is to familiarize students with the branch of mining science, which is involved in spatial-geometric measurements and calculations with the goal of graphically depicting plans and sections of mine workings, the shape and elements of the occurrence of a mineral, its properties, and also the earth's surface within the boundaries of a mining allotment (mine field) ; solutions to various geometrical problems.

The objectives of the course - the formation of practical and applied skills:

- in mathematical processing and analysis of field data of underground surveys;
- in the sources of measurement errors and assessing the accuracy of survey results;
- in methods of orienting underground workings with the earth's surface;

- in solving problems of setting the direction of mining.

SHORT DESCRIPTION OF THE COURSE

The course contains a training program that gives basic concepts about underground surveying surveys, about geometric methods of orientation, about designing points with plumb lines, about ways to adjoin designed plumb lines, about transmitting elevations, about leveling methods in underground mine workings, about setting the direction of mining work. The course is designed in such a way as to teach the student to perform field work of underground surveying surveys, to geometrically process field data in accordance with the instructions, to build and design drawings for solving engineering problems.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: the procedure for laying underground plan-high-altitude networks in accordance with the requirements of the instruction; methods for performing angular, linear and high-altitude measurements on underground mine workings; the procedure for orienting underground mines; basic requirements for the compilation of mining and graphic documentation.

The student should be able to: work with surveying and geodetic instruments when performing angular, linear and high-altitude measurements on underground mine workings; perform basic surveying surveys; to perform calculation and graphic work when processing the results of field measurements on underground mine workings; to solve the tasks of setting the direction of the mine workings.

Operation of electrical installations with voltages up to and above 1000V

CODE – ERG554

CREDIT – 5 (1/0/0)

PRE-REQUISIT - no

PURPOSE AND OBJECTIVES OF THE COURSE

This course is aimed at familiarizing students with the Industrial Safety Rules for the operation of electrical installations with voltages up to and above 1000V.

BRIEF DESCRIPTION OF THE COURSE

Power supply for excavators, drilling rigs, electric locomotives and lighting of workplaces. Switching points and other equipment to provide power to electrical installations. Rules for their safe operation.

Open pit mining technology

CODE - MIN 453

CREDIT - 3 (1/0/2)

Prerequisite -

GOAL AND OBJECTIVES OF THE COURSE: Mastering the technology of stripping and mining operations in the open development of mineral deposits.

SHORT DESCRIPTION OF THE COURSE

Stripping technology for transportless, transport-dump and transport development systems. The mining technology of horizontal, gentle, inclined and steeply dipping fields. Combined field development technology. The technology of developing rocks hydraulically.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: Current status and development prospects of the mining industries. Technological features of overburden and mining operations in the field using various types of mining and transport equipment.

Processing and beneficiation of minerals

CODE – MET 179

CREDIT - 5 (2/1/0)

PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE The purpose of studying this discipline is to gain knowledge by the future engineer of the basics of mineral processing, processes, processing technologies and the integrated use of mineral raw materials. The study of the main directions in the enrichment of minerals.

The main tasks of studying the discipline are: basic concepts about the industry; general concepts about ores, methods of their enrichment and integrated use; enrichment indicators; ore preparation, crushing, grinding, screening and classification processes; gravity enrichment methods and equipment used; flotation enrichment methods, flotation machines; magnetic and electrical enrichment methods; special enrichment methods; dehydration of enrichment products; tailings and wastewater treatment of concentration plants; brief information about the main processing plants in Kazakhstan.

SHORT DESCRIPTION OF THE COURSE In this discipline, brief information on minerals and products of their processing is presented. The methods, processes and schemes of mineral processing taking into account the integrated use of raw materials and waste-free production are considered. The equipment for averaging, crushing, grinding, classification, enrichment, dehydration and dedusting of raw materials is described.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, the student should be able to:

- in specific conditions, select the necessary enrichment method and the equipment necessary for this;
- offer the appropriate technological scheme of mineral processing;

- select material for the necessary equipment and apparatus;
- in addition, when choosing a technological process, consider environmental issues.

As a result of studying the discipline, the student should know:
- the purpose and technological indicators of enrichment;
- preparatory processes and apparatus used;
- methods and technologies for the enrichment of various types of ores and the principles of operation of the equipment used;
- Methods of processing concentrates concentrates.

Interconnection and planning of open cast mining processes

CODE – MIN4601

CREDITS - 5 (2/0/1)

PREREQUISITE – MIN 442 Fundamentals of mining production

PURPOSE AND OBJECTIVES OF THE COURSE. The purpose of studying the discipline is to ensure in-depth mastering by the student of the methods of daily and long-term planning of open-pit mining operations in accordance with the specifics of the conditions for the development of mineral deposits.

BRIEF COURSE DESCRIPTION. Types of cargo flows in the quarry; the concept of complex types of mining and transport equipment. the interrelation of production processes in the quarry; the main organized work of complex equipment; accounting of complex equipment; provision of geological and surveying works of mining; quality assurance of work in the development process; quality of averaging of minerals; main tasks and structure of planning, management and calculation; information and management in the planning system and calculation; planning for a month of mining and drilling operations using computers; planning of repair of mining equipment; calculation of the technological schedule of work on the ledge; shift mining plan; basic operational dispatch management of mobile vehicles and cars.

KNOWLEDGE, ABILITY, SKILLS FOR COMPLETION OF THE COURSE. As a result of studying the course, students develop the ability to evaluate the technology and features of complex mechanization of open-pit mining in the development of deposits occurring in various mining and geological and natural conditions; the basics of equipment acquisition for production processes; methods for calculating technological complexes with a system of smooth and in-depth development.

The student should know: methods of regulation of mining modes in the main daily and long-term planning of mining operations and drawing up a calendar schedule of mining operations for the period of full operation of the quarry; advanced

methods of economic evaluation of technical solutions and their use in drawing up effective mining plans.

The student must be able: the student should be able to independently (including with the use of a computer) carry out daily and long-term planning of mining operations, taking into account the mining and geological, technical, technological and economic conditions of field development.

Underground mining processes

CODE – MIN454

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of teaching the course The purpose of the discipline is to study the classification of production processes, to distinguish between the main and auxiliary production processes. The student must learn to calculate the basic production processes.

Objectives of the course: Study of technology, mechanization and organization of production, loading, delivery of ore and basic requirements for the development of deposits.

SHORT DESCRIPTION OF THE COURSE

Mining and technical conditions of ore deposits. Classification of production processes. The structure of indicators of ore extraction. Economic damage from loss and dilution. Basic requirements for field development. Ore breaking. Mechanical and other methods of breaking. Secondary crushing. Technology, mechanization and organization of production, loading and delivery of ore. Scraper delivery, self-propelled delivery. Vibratory feeders. Conveyors. Explosive delivery. Rock Pressure Management. Transportation of ore mass. Calculation of the cost of ore breaking, delivery and transportation. Auxiliary manufacturing processes. In the study of this discipline all production processes of mining are affected: drilling, blasting, lifting, drainage, ventilation, transport, carrying out horizontal, inclined and vertical workings, their fastening.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

In accordance with the properties of the rocks and the conditions of their development, students will be able to correctly choose the types, sizes of mining and transport equipment; modes and technological parameters of processes; calculate equipment performance by processes; draw up technical documentation for mining operations; organize the implementation of basic and auxiliary processes in accordance with the requirements of the rules of technical operation and safety rules.

Geotechnology of underground mining of uranium deposits
CODE – MIN461
CREDIT -56 (2/0/1)
REQUISITES - MIN 101

PURPOSE AND OBJECTIVES OF THE COURSE: Mastering by students the physical and chemical foundations of geotechnological processes, opening, preparation and field development systems, production processes and equipment in geotechnology.

SHORT DESCRIPTION OF THE COURSE Features of geotechnology. The structure of the geotechnology of uranium deposits. Methods for opening uranium deposits. The choice of the method of opening. Key indicators of the autopsy method. Exploitation of uranium deposits. Methods for determining the efficiency of exploitation of easy leaching deposits. Deposits unacceptable to leaching. Tamponization of uranium deposits. Methods of plugging.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

To know the autopsy, preparation and development systems of deposits, means of mining, as well as information on environmental protection, the basics and specifics of designing geotechnological enterprises, to be able to calculate the parameters for mining by geotechnological methods.

Underground Facilities
CODE – MIN462
CREDIT - 5 (2/0/1)
REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE: To instill in students the knowledge and skills necessary for independent creative solving problems related to the implementation of technological processes for the construction of underground mining facilities and urban underground structures for various purposes; to teach creatively apply advanced equipment and technology, seeking to increase the pace of construction and labor productivity, improve the quality of work, reduce costs and rational use of labor resources.

SHORT DESCRIPTION OF THE COURSE

Basic concepts and features of the construction of mining enterprises. Stages and periods of construction of mining enterprises, i.e. construction of underground mine facilities, urban underground facilities, metro facilities, underground power plants, underground warehouses, underground plants and other underground structures. And also in the discipline the basics of organizing the construction of vertical, horizontal, inclined mine workings and underground chambers of large cross section are studied.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, students can master the following knowledge: - design the shapes and sizes of cross sections of mine workings and underground structures, be able to choose equipment and technologies for the construction of mountain and urban underground structures, find and make engineering decisions for the construction of underground facilities.

The student should know: the types of underground mining conducted to develop solid minerals, and the features of their location in the underground space; types of underground facilities being built for industrial, transport, economic, defense and other purposes; construction methods of mine workings and underground structures in arrays of unstable, medium stable and hard rocks; types of temporary supports and lining.

The student should be able to: independently calculate the shape and size of the cross section of the mine workings of the underground complex, select the equipment and technology for the construction of mountain and urban underground structures, search and make engineering, economic and organizational decisions and justify their adoption.

Mine Surveying

CODE – MAP529

CREDIT - 6 (0/0/3)

REQUISITES – MAP519

GOAL AND OBJECTIVES OF THE COURSE

The aim of the course "Surveying drawing" is to study the principles and techniques of technical and topographic drawing using modern technologies and technical means for compiling and maintaining mine surveying graphic documentation, using the example of AutoCAD computer-aided design (CAD) system.

The objectives of the course include: to familiarize students with the basic concepts and basic drawing skills in CAD AutoCAD; to acquaint students with the main types of surveying and mining and graphic documentation; the study of topographic symbols and conventional graphic symbols on mountain-graphic drawings; to teach students the use of computer technology in solving problems in the framework of future professional activities.

SHORT DESCRIPTION OF THE COURSE

The course “Surveying drawing” discusses the principles and techniques of technical and topographic drawing using modern technologies and technical means for compiling and maintaining mine surveying graphic documentation based on AutoCAD computer-aided design system. The use of computer technology forms a

modern creative approach to solving problems in the framework of future professional activities.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: the main features and functions of the AutoCAD program; AutoCAD tools for creating and editing topographic plans and the main types of surveying drawings: projections, plans, sections, profiles, etc .; conventional signs of large-scale topographic plans.

The student should be able to: correctly apply the functionality and AutoCAD drawing tools to solve problems that arise in the process of 2D-drawing; AutoCAD tools to create, edit, design, print mine surveying graphic documentation; read topographic maps and plans.

Mining and transportation machinery and equipment for underground mines

CODE –TEC 186

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The main goals and objectives of the discipline is to equip the students with theoretical knowledge and practical skills necessary to master the theoretical foundations of the working processes of underground mines equipment.

SHORT DESCRIPTION OF THE COURSE

Mining and transportation equipment of underground mines is one of the leading sections of the cycle of specialized disciplines used at all stages of mining - from the study of working processes in mines and mines in the extraction of mineral resources in general to the most detailed work on the production and operation of this equipment.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student must know: Fundamentals of technical and economic calculations characterizing the effectiveness of the use of mining transport vehicles; methods for determining workloads.

The student should be able to: Formulate the basic requirements for mining transport vehicles and equipment; use reference and informational materials.

Mining and transport machinery and equipment quarries

CODE – PED 147

CREDIT – 5 (2/0/1)

REQUISITES – MIN101

GOAL AND OBJECTIVES OF THE COURSE.

Students obtain knowledge in the field of designing the theory, calculation and operation of mining transport vehicles and quarry equipment necessary for making sound technical and organizational decisions on mining transport vehicles in organic connection with related technological processes of open cast mining and mining and technical conditions Based on the latest advances in quarry technology.

SHORT DESCRIPTION OF THE COURSE

Discipline is a branch of science that studies the working processes of mining-transport machines, analysis of the laws of operation of these machines, mechanisms and equipment, and based on these laws of development, methods of substantiating the optimal values of operating and constructive parameters of these machines and equipment. The machines under consideration are combined machines designed to separate from the mass of rock mass and load it onto mining vehicles.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: Operating conditions of mining transport vehicles of quarries; requirements for the functional bodies of mining transport vehicles; The main factors that determine the characteristics of work processes.

The student should be able to: Reasonably choose the means of complex mechanization of the technological processes of quarries: choose rational modes of operation of mining vehicles.

Shield tunneling complexes

CODE - MIN 455

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

THE PURPOSE AND OBJECTIVES of the COURSE of teaching the discipline is to obtain students knowledge and skills that allow them to solve engineering problems in the selection and use of shields and panel complexes in various geological and hydrogeological conditions.

SHORT DESCRIPTION OF THE COURSE General concepts and classification of tunnel shields and stackers of lining elements; technological processes for panel tunneling; design schemes and features, equipment and units of switchboards and switchboard complexes; non-mechanized shield systems; semi-mechanized shield complexes; mechanized shield complexes. Ways to choose the types of shields; the basics of calculating their design and technological parameters; Organization of work with panel technology. Roadheaders; Roadheaders with continuous drilling executive bodies.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETING THE COURSE As a result of studying the discipline, the student acquires the following knowledge: -

Designs of heading shields and their classification; Production technology using semi-mechanized shields; The technology of work using mechanized shields; The technology for the production of work using shields hydraulically; The construction of the lining with panel technology; Organization of work with panel technology.

The student should know:

Classification of heading shields and shield complexes according to their functional purpose; constructive scheme of panel systems; characteristics and principle of operation of shield systems; Organization of work with panel technology. Classification of roadheaders.

The student should be able to: Use the methodological support for the calculation and selection of mining tunneling complexes, combines; To carry out calculations for panel systems (combines) and justify their choice for the given mining and geological and mining conditions, and the volume of mining operations. Draw up a cyclic schedule for the implementation of panel technology.

Surveying support of mining operations in the construction of mining enterprises

CODE – MAP 531

CREDIT - 5 (1/0/2)

PREREQUISITE

PURPOSE AND OBJECTIVES OF THE COURSE: The purpose of mastering the discipline is to form students' clear understanding of the means and methods of surveying during the construction of a mining enterprise. The main objectives of mastering the discipline are to acquire skills in studying the construction project of a mining enterprise and its working drawings, checking them; transferring geometric elements of buildings, structures and capital mine workings to be built according to the project; carrying out surveying control during the construction of structures on the surface and mine workings for compliance with geometric elements rendered in kind; filming and drafting executive documentation displaying the actual position of buildings, structures and completed mine workings.

BRIEF DESCRIPTION OF THE COURSE

The course is focused on the study of issues related to surveying support for the construction of mining enterprises for the extraction of minerals by open and underground methods. At the same time, the following topics will be considered: general information about surveying works during the construction of quarries and mines; technical design of the organization of construction works; general construction plan; geological report on the approval of reserves; topographic and geodetic works; surveying support during the sinking of split and overburden trenches; general information about lifting complexes of mines; surveying work

during the sinking, fastening and reinforcement of the mine shaft; surveying work during the borehole workings; work during the deepening of the vertical shaft; general information about construction of subways;

The student will know:

- general information about mining technology in the construction of mining enterprises;
- tasks of the surveying service during the construction of mining enterprises;
- requirements for the maintenance of surveying documentation;
- ways to create support and filming networks;
- methods of center work;
- methods and technologies of surveying work during the sinking, fastening and reinforcement of trunks, installation of the lifting complex, carrying out near-barrel workings;
- rules for conducting briefings and conditions for safe mining operations.

The student will be able to: - to carry out planned, high-altitude and landmark-connecting instrumental surveys of mine workings during their construction;

- to ensure control and compliance with the parameters of technical structures for mining operations;
- perform an analysis of the accuracy of surveying work;
- choose the safe conduct of filming and center work;
- collect, systematize and analyze topographic and geodetic information for

Special methods of conducting open cast mining

CODE - MIN 463

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

PURPOSE AND OBJECTIVES OF THE COURSE Study on the basis of modern achievements of mining science to consider the main processes and phenomena occurring in the bowels under the influence of field development by hydraulic and geotechnological methods. The study of questions on the theory and technology of open hydraulic mining of PI deposits.

SHORT DESCRIPTION OF THE COURSE

Theoretical foundations and engineering methods for calculating hydraulic rock transport. Modes of pressure hydraulic transport. Water supply schemes for hydraulic installations. Equipment for pressure hydrotransport in quarries. Hydromonitor erosion of rocks in the massif. Schemes of hydromonitor erosion of rocks. Classification of hydraulic dumps. Processes and technology of hydraulic dumping. The technology of preparing rocks for erosion. Dredging technology. Design features of dredgers. Moving dredgers. Technology for the development of an underwater

quarry with dredgers. Open hydraulic field development systems. Opening of deposits during hydraulic development. Technological schemes of hydromonitor development of rocks. Types of hydraulic structures and their purpose.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: theoretical and practical knowledge on the theory, technology and design of processes of hydraulic and geotechnological methods of developing mineral deposits.

Development and computer design of mining development plans

CODE – MIN464

CREDIT - 5 (1/0/2)

REQUISITES - MIN 101

COURSE PURPOSE AND OBJECTIVES: Future specialists will be able to analyze mining conditions, mining planning, development of underground mining development plans and computer design of mining development plans.

SHORT DESCRIPTION OF THE COURSE:

In the course “Development and computer-aided design of mining development plans”, a development plan for underground mining, a development plan for uranium deposits, and software used to develop a mining development plan are discussed in detail.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying this discipline, students should know and be able to:

- conduct an analysis of mineral deposits;
- develop mining development plans and methods for their development;
- apply new software tools used in the development of mining development plans.

Mining graphics in underground mining of uranium deposits

CODE – MIN465

CREDIT - 5 (1/0/2)

REQUISITES - MIN 101

GOAL AND OBJECTIVES OF THE COURSE: Training of future specialists in the field of mining during underground and opencast mining in various mining and geological and mining conditions, methods, methods of using underground well leaching with linking materials in graphical form.

SHORT DESCRIPTION OF THE COURSE

The course “Mining graphics in underground mining of uranium deposits” discusses in detail the technology of downhole leaching, computer processing of

opening methods and preparation methods, design of opening schemes, well piping, location of filters, software used to develop a plan of uranium deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying this discipline, students should know and be able to: conduct an analysis of design graphic and other documents; to draw up graphic diagrams of opening, tying wells, the location of filters; apply new software tools for the development of graphic materials for underground well leaching.

Tunnel Construction Technology

CODE – MIN456

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

PURPOSE AND OBJECTIVES OF THE COURSE A statement of the main theoretical and practical provisions on engineering structures, the use of modern technology and technical means in the construction of tunnels for various purposes, using modern scientific achievements in the field of underground construction.

SHORT DESCRIPTION OF THE COURSE

The technology of construction of tunnels in the mountain way. The technology of building tunnels in a shield way. Tunnel construction technology in special ways. Open tunnel construction technology. The technology of construction of subway stations. The construction of mine shafts. Organization and planning of the construction of tunnels and subways. Repair, reconstruction and restoration of tunnels. The construction of artificial structures in transport. Repair of artificial structures.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Acquisition of skills to work with modern devices, equipment, software products and modern technologies for the construction of engineering structures, tunnels. To instill in the future bachelors the skills necessary for the competent solution of production problems arising in the process of creating engineering-complex objects of underground transport construction and other objects.

The student should know: modern technologies for the construction of underground engineering structures and tunnels; technological processes sequentially performed during tunneling; types of equipment used in the construction of tunnels and underground structures.

The student should be able to: work with software products used in the development of projects for the construction of tunnels and underground structures; types of machines and equipment used for the construction of underground structures, modern technologies for the construction of engineering underground structures and tunnels.

Methods of fixing underground structures

CODE – MIN457

CREDIT - 5 (2/0/1)

REQUISITES - MIN 101

PURPOSE AND OBJECTIVES OF THE COURSE.

Study of the theory and practice of choosing methods and means of maintaining underground workings for various mining and geological conditions, calculating the parameters of supports, analysis of the current state and trends of further development of supports, and the technology of its construction.

SHORT DESCRIPTION OF THE COURSE

The concept of lining and the process of fixing.Characteristics of rock stability.Classification of supports for mine workings and requirements for them. Fixing materials used for fixing mine workings and underground structures. Design features of fixing materials and methods for calculating their strength and stability, taking into account the specifics of their interaction with the rock mass. Mounting horizontal, inclined and vertical mine workings.Technology and equipment for the construction of roof supports.Technological schemes for the construction of roof supports.Means of mechanization for the construction of various types of supports. (monolithic concrete, anchor and spray concrete, etc.) and ways to improve them.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, students acquire the following knowledge:

- studies materials for concrete and reinforced concrete structures, wooden and metal supports, anchor and spray concrete supports, tubing structures; And also the course enables students to choose rational types of fixing materials, determine the load on the bearing elements, solve specific engineering problems associated with the design of underground structures.

The student should know: current regulatory documents; materials for concrete and reinforced concrete structures, metal, wooden, anchor and spray concrete supports; the content and volume of passports securing the mine workings; classification of types of supports; requirements for roof supports; trends in the improvement of the lining.

The student should be able to: analyze the means and methods of maintaining the mine workings; choose the main technological equipment for the construction of lining; Skillfully develop the technology of fastening mine workings with a view to minimizing labor and material costs; use the knowledge about new types of lining and the technology of their construction to improve the fixing process.

Surveying and geodetic instruments
CODE – MAP520
CREDIT– 5 (1/2/0)
PREREQUISITE - MAP 519

GOAL AND OBJECTIVES OF THE COURSE.

The aim of the course “Surveying and geodetic instruments” is the acquisition of theoretical knowledge and practical skills of working with modern surveying and geodetic instruments and their use for solving applied problems in mining.

The objectives of the course include: Studying the theory of optical systems for surveying and geodetic instruments; Studying the mechanical devices of instruments; Studying the types and designs of modern instruments; Studying the methods of researching instruments.

Surveying and geodetic instruments are accurate optical-mechanical devices, since when working with them, the main measuring operations are carried out simultaneously by optical systems (pointing a cross of a grid of threads on target targets, taking readings on rails, etc.) and mechanical devices providing making rotations around the axes, readings along the limbs, setting the axes and planes of the device in horizontal and vertical position by levels, etc. In accordance with this, the course sets out the basics of geometric optics and provides descriptions of the designs of instruments and tools within the limits necessary to understand the principles of operation and their correct application. The correct application is the ability to choose a tool for the measurement data, to research it and work with it.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE.

Students will know:to research instruments, to carry out their calibration and adjustment; methods and techniques of research and calibration of instruments; the main types of work using surveying and geodetic instruments; methods and techniques of proper operation with instruments.

Students will be able to: choose the right instrument for the qualified implementation of the assigned surveying and geodetic tasks; carry out verification and adjustment of the main surveying and geodetic instruments; perform the main types of surveying and geodetic works using appropriate instruments.

Financial-economic model of a mining enterprise
CODE – MIN 445
CREDITS - 5 (2/1/0)
PREREQUISITE – MIN 448 Construction of mining enterprises

PURPOSES AND GOALS OF THE COURSE. The purpose of studying the course is to teach students how to carry out a technical and economic assessment of

development options of mining operations in market conditions and to establish economically viable investments for the planned production capacity of a mining enterprise. The objectives of the course include: calculating the cost of production; structure and content of the financial and economic model of a mining enterprise.

SHORT DESCRIPTION OF THE COURSE. Composition, structure and value of production costs; the need of a mining enterprise or production site for financial resources; assessment of options in static and dynamic models; determination of the cost of production, profit and profitability of production.

KNOWLEDGE, ABILITIES, SKILSS UPON COMPLETION OF THE COURSE. Students will gain knowledge on the economic part of a mining enterprise project as a result of studying the course. The practical importance of the course consists of developing skills in calculating the cost of production and skills in drawing up a financial and economic model in tabular form with minimal investment to achieve the implementation of production programs for the development of mining operations.

Student should know: calculation of the final product cost and type of work; static and dynamic criteria for evaluating the design of mining enterprises; the structure and content of the financial and economic model of a mining enterprise; the procedure and sequence for determining the discounted present profit and the payback period of the investment.

Student should be able to: perform a feasibility study of comparable mining options; to compose the financial and economic model of a mining enterprise required in specific conditions and to carry out an assessment of an economically profitable option for the development of mining operations.

Underground mining technology
CODE - MIN458
CREDIT - 5 (1/0/2)
PREREQUISITE- MIN 101

PURPOSE AND OBJECTIVE OF THE COURSE

The purpose of the course: "Technology of underground mining" is a special discipline that forms a specialist - mining engineer-technologist. After studying the discipline, the student must know the mutual location in the space of all mining workings, which is a necessary condition for creative study of the issues of opening and preparation of mine fields, development systems for various mining-geological and mining conditions of deposits.

Course objective: As a result of studying the discipline in accordance with the state standard of higher education, students should know: the history of mining development on the territory of the Republic of Kazakhstan and in the CIS countries;

the level of mining and their need in the national economy; information about mineral deposits and conditions of their occurrence; methods of mining and prospects for the development of methods; the essence of mining; the main elements and their parameters; the essence of underground mining and the main mine workings; the main production processes and technical and economic indicators of the activity of mines; methods of opening and systems for the development of mineral deposits; main technological processes; technical and economic indicators.

BRIEF DESCRIPTION OF THE COURSE

The discipline includes sections: opening and preparation of deposits, underground mining processes, mining transport vehicles and equipment, underground mining systems.

KNOWLEDGE, SKILLS, SKILLS AT THE END OF THE COURSE

Mastering the discipline will allow students to be able to assess the mining and geological conditions of mining operations, to have an initial understanding of the ways of developing mineral deposits.

As a result of studying the discipline "Underground mining Technology" in accordance with the state general education standard of higher professional education, students should:

- have an idea of mining science and the objects of its study;
- know general information about rocks, open, underground mining of mineral deposits;
- be able to use the acquired knowledge in the study of subsequent special disciplines.

Financial-economic model of a mining enterprise

CODE – MIN 466

CREDITS - 5 (2/1/0)

PREREQUISITE –

PURPOSES AND GOALS OF THE COURSE. The purpose of studying the discipline is to teach students to master low-waste technologies with natural resources in ore pits and their importance in the development of extractive industries, rational use and protection of resources of rock mining enterprises, waste-free and low-waste technologies for the integrated use of mineral resources. The objectives of the course include: the importance of low-waste technologies with natural resources in ore quarries, features of open-pit mining of mineral deposits, mechanization technologies.

SHORT DESCRIPTION OF THE COURSE. Theoretical material on the main issues of resource-saving and low-waste technologies; management of resource-saving processes at enterprises and the ability to apply them in professional activities.

KNOWLEDGE, ABILITIES, SKILSS UPON COMPLETION OF THE COURSE. As a result of studying the course, students will gain knowledge on the basic concepts of resource-saving and low-waste technologies. The practical interpretation of the course will develop the ability to make the right organizational and technical decisions when performing various types of mining operations, to have competence in solving issues related to the basics of mining production.

Student should know: analyze tools, vehicles used in mining and loading operations in ores; calculate methods of preparing rocks for mining and loading; calculate and analyze the productivity of the enterprise, calculations for losses and dilution of rocks, economic indicators of the enterprise.

Student should be able to: have an idea about the methods of mining mineral deposits, about the environmental consequences of mining operations and their impact on the environment, about the tools of mechanization of the main and auxiliary processes.

Underground mining systems

CODE – MIN467

CREDIT - 5 (2/0/1)

REQUISITES - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of studying the course “Underground Mining Systems for Mineral Processing” is to deeply master the students ’underground mining systems for MIP and understanding of the main production processes of treatment excavations carried out in blocks (panels, chambers) for ore mining.

BRIEF DESCRIPTION OF THE COURSE The discipline "MPE Development Systems", which is a special discipline that defines the profile of a specialist in mining, arising from the need and demand for acquired knowledge, skills in production and the activation of cognitive and creative activities of students ..

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Studying the underground mining systems of ore deposits gives students the opportunity to get the skill in choosing a rational development system for specific deposits. The acquisition of theoretical knowledge about existing development systems, taking into account their advantages and disadvantages, is through the improvement of the applied systems designs, as well as their technical and economic indicators.

Hydraulics for Uranium Mining

CODE – MIN468

CREDIT - 5 (2/0/1)

REQUISITES - MIN101

COURSE PURPOSE AND OBJECTIVES Features of the development of uranium deposits, hydrodynamics of solutions, filtration rate in a simple environment of uranium infiltration deposits; hydrodynamic system for filtering solutions in porous media;

SHORT DESCRIPTION OF THE COURSE

The short-range principle in hydrodynamic systems of PSV metals; head optimization in technological wells during uranium mining; block acidification and leaching time; mathematical model of the concentration of a productive solution, specific acid consumption, spreading and loss of solutions; theoretical determination of the ratio to solid and the minimum cost-effective content of uranium in the productive solution by the criterion of profit.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETING THE COURSE As a result of studying the discipline, the student must know the working processes, purpose, basic parameters of the hydraulics of solutions, be able to use theoretical knowledge in the development of uranium deposits using the PSV method.

Construction Technology of Vertical Mines

CODE – MIN469

CREDIT - 5 (2/0/1)

REQUISITES - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of mastering the discipline "Technology for the construction of vertical mine workings" is to form students' ideas about the technology of building vertical shafts of mines and to obtain the basic knowledge and skills necessary for the student to carry out educational and professional activities of a specialist.

The task of studying the discipline is: to educate students in the development and design of technology for the construction of vertical mine shafts, as the most important elements of a mining enterprise for mining mineral resources underground.

SHORT DESCRIPTION OF THE COURSE

The course examines the main issues of the technology for the construction of vertical mine workings: the preparatory period, mining work in the trunk under normal and complex mining and geological conditions, as well as work to deepen the trunks. Selection and justification of technological schemes for construction, blasting operations, ventilation methods and fastening workings, loading and lifting rocks to the surface, etc. It also provides methods of a feasibility study for the selection of driving patterns, a complex of sinking equipment, type of support, and optimization

of the parameters of the sinking cycle.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The ability to develop technological schemes and a schedule for the construction of vertical mine workings, to choose methods, equipment and technology for mining construction, focusing on innovative developments; provide technological and environmental safety; to draw up the necessary technical documentation (passports of military intelligence, attachments, etc.); Willingness to provide technical management of mining and blasting operations in the construction of vertical mine workings.

The student should know: the methodology and methods of engineering design, the main processes and production operations, the methods and methods of conducting mining and construction works in ordinary and complex mining and geological conditions during the construction of vertical mine workings.

The student should be able to: independently determine the cross-sectional shape of vertical mine workings for various purposes, calculate the main parameters of the technology of tunneling work of vertical mine workings, choose technological schemes for driving shafts.

Mathematical processing of surveying and geodetic measurements

CODE – MAP532

CREDIT - 5 (1/2/0)

REQUISITES - MAP 519

GOAL AND OBJECTIVES OF THE COURSE Students study the theory of geodetic measurements. The objectives of the course include: Analysis of measurement results using mathematical methods; Assessment of the correctness of measuring solutions; Getting the desired values; Studying the patterns of distribution of measurement errors;

SHORT DESCRIPTION OF THE COURSE

The main parameters of the normal law. The normal distribution function and its relationship with the probability integral. The meaning of the probability integral. The probability of a normally distributed random variable falling over a given interval. Relationship formulas of mean and probable deviations with standard deviation. The central limit theorem is A.M. Lyapunov. The value of the normal law for the theory of measurement errors. The concept of other laws of distribution: uniform, student, Pearson. Problems of the theory of measurement errors. Classification of measurement errors. Gauss curve and its properties. Properties of random errors. The main postulates of the theory of errors.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student must know:

- study of the laws of occurrence and distribution of measurement errors and
- calculations;
- assessment of the accuracy of measurement results; setting tolerances -
- criteria indicating the presence of gross measurement errors;
- assessment of the accuracy of the functions of the measured quantities;

The student must be able to:

- Calculation of the results of equal and unequal measurements;
- Determine the root mean square, absolute and relative errors of surveying and geodetic measurements;
- Perform an accuracy assessment, calculate the pattern of error distribution to reduce their weight when determining measurement results;

Technological complexes of open cast mining

CODE - MIN 470

CREDIT - 5 (1/0/2)

PREREQUISITE – MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the course: Mastering in-depth theoretical knowledge of the technological complex of open cast mining, mastering the calculation methods for making technological decisions when completing equipment in relation to the particular conditions of development of solid mineral deposits.

Course Objectives: To instill in students solid skills in technology and complex mechanization of open cast mining in the development of deposits occurring in various geological and natural conditions; mastering the theoretical foundations of equipment for the implementation of production processes; the development of methods for calculating technological complexes with continuous, in-depth and combined development systems.

SHORT DESCRIPTION OF THE COURSE

The discipline includes sections: The theory of complex mechanization of mining and technological complexes with continuous, deep and combined development systems.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSEAs a result of studying the discipline, the student should:

- It is reasonable to choose the best technological complex for various mining and geological conditions;
- Justify the structure of the complex, types of equipment at all levels of the implementation of the main production processes;
- It is reasonable to choose the best development system for these conditions,

form the design of the working area and show its development from the beginning of the construction of the quarry to the end of the development of the field;

- Determine the operational performance of individual machines and the whole complex, as well as the main parameters and indicators of the development system when applying the selected technological complex;
- Independently solve engineering problems and complete the technological part of the graduation project.

Array state management

CODE – MIN483
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

THE GOAL AND OBJECTIVES OF THE COURSE is aimed at familiarizing with the approaches and methods for solving the practical problems of geomechanics that miners face in their daily activities.

BRIEF DESCRIPTION OF THE COURSE Under the control of the state of the rock mass, it is necessary to understand the regulation of the nature and parameters of geomechanical processes in order to increase the safety of mining operations and their effectiveness. By regulating the development of geomechanical processes in the rock mass, they strive to achieve such a situation that the processes develop in a safe direction and their parameters are within the limits of pre-set safe values.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- know the conditions and patterns of manifestations of rock pressure, gas-dynamic phenomena, endogenous fires and other hazards; theory and mechanism of impact on the rock stratum of preparatory and treatment works;
- be able to select and calculate the main parameters of the methods for controlling the properties and condition of the rock mass; make the most effective technological solutions for specific mining and geological conditions.

Drilling and exploitation of geotechnological wells

CODE – MIN471
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The acquisition of theoretical knowledge and practical skills of drilling and operating geotechnological wells.

SHORT DESCRIPTION OF THE COURSE Drilling of production and geotechnological wells considers: historical background of the development of exploration drilling; methods of drilling production and geotechnological wells;

varieties of machines and equipment for drilling production and geotechnological wells; features of preparation for operation of production and geotechnological wells of uranium deposits; creation of cavities in the bottom of the wells.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student must be able to choose and calculate the main parameters of the methods and the state of the rock mass; make the most effective technological solutions for specific mining and geological conditions.

Calculation of the design of underground structures

CODE – MIN472

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The purpose and objective of this discipline is to instill in students knowledge in the design and calculation of structures of underground structures. To teach the student to make optimal decisions on the organization of the construction of an underground structure and the calculation of its structure. Mastering the practical skills of choosing the best solutions for organizing the construction of underground structures, implementing the knowledge gained in the graduate design and subsequent engineering activities.

SHORT DESCRIPTION OF THE COURSE

Calculation of physical and mechanical properties of rocks; Prediction of stability of unsecured underground structures, calculation of loads on roof supports (lining); Classification of supports, requirements and initial data for choosing the type of supports; Structural analysis and calculation methods for monolithic concrete and reinforced concrete lining (lining); Structural analysis and calculation methods for precast concrete and reinforced concrete lining (lining); Structural analysis and calculation methods for cast-iron tubing and steel-concrete lining (lining); Structural analysis and calculation methods for spray-concrete lining (lining); Structural analysis and calculation methods for anchor support.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE As a result of studying the discipline, the student acquires the following knowledge: - on the basis of rock mechanics and a technical and economic analysis of structures, students can calculate the support parameters, choose the types of supports for specific conditions depending on the purpose of the development.

The student should know: regulatory documents governing the design and calculation of engineering structures of underground structures; general design principles, the composition and content of project documentation, scientific and engineering fundamentals of the choice of technologies for securing underground

structures and labor protection.

The student should be able to: calculate the structures of underground structures, determine their load-bearing capacity of reliability; to design the organization of work on the fastening of underground structures; to control and ensure the correct implementation of production tasks; make technical security decisions.

Cartography and GIS in mining

CODE – MAP 528

CREDIT - 5 (1/0/2)

PREREQUISITE – MAP 519

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of mastering the discipline "Cartography and GIS in mining" is the formation of students:

- understanding of theoretical positions, basic methods and technologies of geoinformation systems (GIS);
- acquisition of the ability to use GIS packages in the construction of digital maps and subsequent analysis of digital models of rock mass;
- acquisition of the ability to use GIS packages in the work of mine surveying.

BRIEF DESCRIPTION OF THE COURSE

The course discusses the classification, structure and functionality of GIS, features of spatial data modeling. After all, geoinformation modeling is the main method of creating digital models of spatial objects and phenomena of a wide spectrum. The data placed in a digital map - multi-scale, multi-temporal, non-precision and spatially coordinated in various ways, form a multi-layered organized object structure, which is a model of the territory. Examples of processing geodetic data in GIS, methods of analyzing an array of normative, statistical and other data, indicators of the effectiveness of creating digital plans and maps are shown.

KNOWLEDGE, SKILLS, SKILLS AT THE END OF THE COURSE

To know

- theoretical provisions, basic methods and technologies of geoinformation systems;
- the main methods of drawing up digital maps and plans.

be able to

- analysis of digital models of rock mass;
- determine the spatial position of objects based on the results of their computer modeling.

own

- work in GIS programs;

• methods of processing geodetic and surveying measurements.

Open pit mining of building materials
CODE – MIN 473
CREDIT - 5 (1/0/2)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSETeaching students the science-based methods of open development of deposits of building materials, providing high technical and economic performance of mining enterprises, the rational use of natural resources and environmental protection. Know the technology of mining in quarries of building materials.

SHORT DESCRIPTION OF THE COURSEFeatures of open development of building rocks. Technological properties of building materials.Features of the production processes of mining in the extraction of building rocks.Technology for preparing rocks for excavation and transportation.Development systems and technological complexes at the deposits of building rocks.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of the knowledge gained in the discipline, the student should be able to:

- assess the influence of rock properties, as well as the state of the rock mass on the choice of technology and mechanization of the development of building materials;

- to form technological schemes of mining operations, calculate the parameters of the elements of the development system, technological processes of mining, calculate the productivity of mining and transport vehicles and their complexes, choose a development system, opening, technology and mechanization of mining, taking into account the mining and geological features of deposits of building materials.

Technology and complex mechanization of underground mining
CODE – MIN474
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

PURPOSE AND OBJECTIVES OF THE COURSE: The purpose of teaching the discipline is to provide students with deep professional knowledge about the order, sequence and volume of preparatory cutting work, mechanization and organization of technological processes for the cleaning excavation, choosing a rational development system and optimizing its parameters. Prospects for the

development of underground mining of mineral deposits.Improving the technology and mechanization of automation of underground mining operations.

SHORT DESCRIPTION OF THE COURSE order, sequence and volume when conducting preparatory-rifling workings and dividing into panels, chambers, floors, layers, etc.; the design of development systems for the development of horizontal, gentle, inclined and steeply falling ore deposits; technological schemes for breaking, production and delivery of ore, roof management; development system parameters; technical and economic indicators; directions for improving ore mining technology and design of mining systems; methods for choosing a rational development system for specific conditions.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- be able to reasonably choose the most safe and effective technological development scheme for specific mining and geological conditions, design a system and calculate the main parameters and treatment work, analyze technical and economic indicators and ways of improvement.

The equipment of the geotechnological field for underground downhole leaching of uranium

CODE – MIN475

CREDIT - 5 (2/0/1)

PREREQUISITE – MIN101

GOAL AND OBJECTIVES OF THE COURSE: The purpose of the discipline is to train specialists in the field of uranium mining using the PSV method, and to acquire the necessary skills for independent practical activity.

SHORT DESCRIPTION OF THE COURSE

During the course, the student will study the basic equipment of the geotechnological field, methods for binding blocks, the design of the head of geotechnological wells, the equipment of technical units for receiving and distributing solutions, technical units for acidification, types and designs of pipelines for transporting working solutions.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Make decisions on the selection of geotechnological field equipment for underground borehole leaching.

Design of construction of mining facilities

CODE - MIN 476

CREDIT - 5 (2/0/1)

PREQUISIT - MIN101

PURPOSE AND OBJECTIVES OF THE COURSE

Training of specialists for production and technological activities and design and construction work in the field of construction of surface structures of mining enterprises.

The task of the discipline is to study the methods of calculating the load-bearing structures of the surface structures of mining enterprises.

SHORT DESCRIPTION OF THE COURSE

Classification of buildings and structures, basics of calculating load-bearing structures, basics of calculating load-bearing structures, calculation of beams, determination of moments of external and internal forces, calculation of beams and roof trusses, calculation of beams and roof trusses, calculation of floor beams, calculation of floor beams, calculation of columns, calculation of foundations and foundations, earthworks, technology for the construction of mining buildings and structures.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

After completing the course, the student will master the knowledge of choosing an effective technology for the construction of mining buildings and structures, independently draw up projects for the supporting structures of buildings and structures.

The student should know: calculation methods for the main load-bearing structures: roof beams, floor beams, columns, foundations and foundations, the composition of concrete of the main load-bearing structures of buildings and structures.

The student should be able to: choose appropriate construction technologies, calculation schemes, determine the load on the load-bearing elements of buildings, solve specific engineering problems associated with the design of mining buildings and structures.

Open pit mine surveying

CODE –MAP521

CREDIT - 5 (1/2/0)

REQUISITES – MAP519

PURPOSE AND OBJECTIVES OF THE COURSE: To acquire the necessary knowledge for conducting surveying work in the design, construction and operation of quarries, to master the methods of creating basic geodetic and surveying networks for surveying, to conduct surveying work at the stage of exploration, construction and operation of the field.

SHORT DESCRIPTION OF THE COURSE

It is necessary to learn how to compile surveying plans, sections, and solve

engineering problems that are necessary when developing a deposit in an open-pit mine at the stage of pit construction, as well as during operation and closure of a pit or when combined work of a pit and underground mine.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should be able to make shooting substantiation in the quarries, transfer data from the project in kind, installation and operation of mining and transport equipment, provide drilling and blasting operations on the quarry. to monitor the stability of the quarry sides, plan the development of mining operations, provide reclamation, make all kinds of surveys made at the quarries during construction, operation of quarries, creation of waste dumps, and reclamation of the area.

Subsoil use contract and license

CODE – MIN 477
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose of the discipline is to deepen and consolidate the theoretical knowledge acquired by students in the process of independent study of educational material, as well as improving practical skills in the application of mining legislation, protecting the rational use of subsoil resources and state management of the mining industry.

The objectives of the discipline are:

1. The study of the mechanism for regulating relations arising in connection with the development, research, use and protection of subsoil resources;

2. The development of knowledge of regulatory documents that determine the procedure and conditions for the use of subsoil resources in industry, which every specialist in this field of public relations should possess;

3. The formation of a high general, scientific and legal culture, the development of abstract, analytical thinking.

SHORT DESCRIPTION OF THE COURSE Ownership in subsoil use. Features of state regulation in subsoil use. The specifics of the subsoil as an object of use. Subsoil users Subsoil use restrictions. Terms of use of subsoil plots. State licensing system. Organizational support of the state licensing system. License for the right to use subsoil. The content of the license for the right to use subsoil. Provision of mineral resources for the development of deposits of common mineral resources. Grounds for termination of the right to use subsoil. Basic requirements for the rational use and protection of mineral resources. State control over the rational use of mineral resources and the protection of mineral resources. State examination of mineral reserves. Land use conditions of mineral deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE.

A specialist who has studied the course “Contract and license for subsoil use”:

- must be ready to put his knowledge into practice;
- navigate in the ongoing economic and technological policies in the field of ecology and subsoil use of the Republic of Kazakhstan;
- know the laws and regulations in this branch of legislation, be able to search for legal norms governing the rights in the field of ownership, use and disposal of natural resources;
- own the mechanism for applying laws and by-laws; have experience in regulating public relations in the activities of a mining enterprise from its creation, operation and liquidation.

Subsoil use contract and license

CODE – MIN 478

CREDIT -5 (2/0/1)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose of the discipline is to deepen and consolidate the theoretical knowledge acquired by students in the process of independent study of educational material, as well as improving practical skills in the application of mining legislation, protecting the rational use of subsoil resources and state management of the mining industry.

The objectives of the discipline are:

1. The study of the mechanism for regulating relations arising in connection with the development, research, use and protection of subsoil resources;
2. The development of knowledge of regulatory documents that determine the procedure and conditions for the use of subsoil resources in industry, which every specialist in this field of public relations should possess;
3. The formation of a high general, scientific and legal culture, the development of abstract, analytical thinking.

SHORT DESCRIPTION OF THE COURSE Ownership in subsoil use. Features of state regulation in subsoil use. The specifics of the subsoil as an object of use. Subsoil users Subsoil use restrictions. Terms of use of subsoil plots. State licensing system. Organizational support of the state licensing system. License for the right to use subsoil. The content of the license for the right to use subsoil. Provision of mineral resources for the development of deposits of common mineral resources. Grounds for termination of the right to use subsoil. Basic requirements for the rational use and protection of mineral resources. State control over the rational use of mineral resources and the protection of mineral resources. State examination of mineral reserves. Land use conditions of mineral deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE.

A specialist who has studied the course “Contract and license for subsoil use”:

- must be ready to put his knowledge into practice;
- navigate in the ongoing economic and technological policies in the field of ecology and subsoil use of the Republic of Kazakhstan;
- know the laws and regulations in this branch of legislation, be able to search for legal norms governing the rights in the field of ownership, use and disposal of natural resources;
- own the mechanism for applying laws and by-laws; have experience in regulating public relations in the activities of a mining enterprise from its creation, operation and liquidation.

Geotechnological methods for developing solid minerals

CODE – MIN 479
CREDIT -5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The main methods of geotechnological methods in the development of solid minerals. The composition of the productive solutions. Fundamentals of ion exchange processes.

SHORT DESCRIPTION OF THE COURSE Questions of geotechnological methods of mining. Physical and chemical foundations of geotechnological processes. Opening, preparation and field development systems, production processes and equipment in geotechnology. Specificity of designing geotechnological enterprises.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE To know the stages of geotechnology design, constant and determinable parameters and influencing factors in the design of geotechnology Environmental aspects of mining and prospects for geotechnology in this direction. To be able to apply the obtained theoretical knowledge in production during crane production using the PSV method.

Special methods of building underground structures

CODE – MIN480
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose and task of studying the discipline is to train specialists in the field of mine and underground construction, to acquire the necessary skills for independent practical activity in the construction of underground structures in difficult mining and geological conditions.

SHORT DESCRIPTION OF THE COURSE The discipline considers the strengthening of soils and rocks by physicochemical methods: cementation, bitumenization, silicatization, resinization, etc. The main special methods for constructing underground structures: tunneling with preliminary freezing of rocks, the construction of underground structures under compressed air, with lowering groundwater , construction of underground structures using the “wall in the ground” method. Special methods for penetrating the mouth of the trunks in unstable rocks.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, the student acquires the following knowledge: - methods of driving mines and underground structures in difficult mining and geological conditions; methods of sinking with preliminary freezing of rocks; rock plugging methods; modern physico-chemical methods of strengthening rocks; determine the necessary parameters and characteristics when using special methods of building underground structures; to find a rational scope for each of the studied special methods of building underground structures.

The student should know: the history of the development of special construction methods; the essence of each method and the possibility of its application; names, properties of the materials used and equipment characteristics; technology and sequence of work in one or another special way in the construction of vertical shafts, horizontal and inclined mine workings in various geological conditions; regulatory documents and technical documentation.

The student should be able to: independently choose a special method of construction for specific mining and geological and hydrogeological conditions; independently calculate the main parameters, select the necessary materials and equipment to perform work in this way; manage the implementation of a special method in practice; to improve the technology for performing these works; comply with environmental requirements during construction and improve the safety conditions for workers.

Mine surveying in mine construction

CODE - MAP 522

CREDIT - 5 (1/0/2)

PREREQUISITE - General course of mine surveying, Construction mining facilities.

PURPOSE AND TASKS OF THE COURSE

The purpose of teaching the discipline " Mine surveying in mine construction" is to train future specialists to carry out surveying services and monitor the correctness of the passage of mine workings in accordance with the requirements.

The student should be well aware of all the issues of mining construction,

without which it is impossible to properly solve mining technical problems with surveying support.

BRIEF DESCRIPTION OF THE COURSE

When laying the mine shaft and building surface structures on the earth's surface, the surveying service performs the creation of a geodetic reference network, compiling data for terrain planning, breaking down and fixing the centers and axes of the shaft shafts, transferring the design contours and axes of buildings and structures to the terrain, servicing the installation of copra and installation of lifting equipment.

When penetrating and reinforcing the barrel, the survey service provides the correctness of the laying of the trunk, controls the verticality of the trunk, the correctness of the mounting installation.

In addition, the surveying service sets the direction for near-shaft and capital workings and controls the accuracy of performance. These important points are considered when studying this discipline.

KNOWLEDGE AND SKILLS TO COMPLETE THE COURSE

Students will know:

During the construction of a mining enterprise, vertical and inclined workings with the help of special measurements brings the elements of the project into nature, as well as establishing the relationship between underground mine workings and the earth's surface, which are studied in this discipline.

Students will be able to:

- to carry out in the process of construction of buildings and conduct mine workings in compliance with the geometric elements of the project,
- perform surveying surveys,
- to make plans and sections of the actual position of the newly constructed structures and the mine workings covered in the depths.

Aerology mining enterprises

CODE – MIN481

CREDIT - 5 (2/0/1)

PREREQUISITE – MIN 101

GOAL AND OBJECTIVES OF THE COURSE: To gain knowledge about the mine atmosphere and the atmosphere of quarries, the laws of air movement, measures to ensure safe working conditions for workers, ways to ventilate mines, face faces and quarries.

SHORT DESCRIPTION OF THE COURSE Mine air. Change in the composition of the air when it moves through the mine workings. Components of mine air. Poisonous and radioactive admixtures of mine air. Gas abundance of mines and quarries. Methane. Physico-mechanical properties of methane. Types of methane

emission. Permissible norms of methane content in mine air. Degassing of mine workings. Mine dust. Combustible, explosive properties and factors affecting the explosiveness of dust mixtures. Thermal conditions of mines and quarries. Microclimate of mine workings. Thermo-humid parameters of mine air. Mine air conditioning. The basic equations of mine aerostatics. Types of pressure in moving air. The basic equations of mine aerodynamics. Modes of air movement and types of air flow. The similarity of mine ventilation flows. Venting dead-end workings. Schemes and methods of ventilation of mines. The choice of ventilation scheme for mines. Air leaks in the mines. Fans of the main ventilation on the surface of the mines. The work of underground auxiliary fans. Means of ventilation and ventilation structures. Schemes of natural ventilation of quarries. Assessment of the effectiveness of natural ventilation of a quarry. Dust ventilation service of mines and mines. Organization of dust ventilation service. Design of ventilation of mines. Calculation of economic indicators of mine ventilation.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

At the end of the course, students should know:

- change in the composition of the air during its movement through the mine workings and types of air flows in the mine workings;
- mine dust and gas abundance of the mine, combustible and explosive properties, MPC of dust and gases, as well as measures to combat explosions of dust and gases;
- thermal regime of mines and laws of air movement;
- methods and schemes for ventilation of mines and quarries, ventilation design.

Carrying out mine workings in quarries

CODE - MIN 482

CREDIT - 5 (1/0/2)

PREREQUISIT - MIN101

PURPOSE AND OBJECTIVES OF THE COURSE

The goal is to study the theory and practice of mining in open pits, mastering the computational methods of making technological decisions in relation to the geological features of solid mineral deposits.

The objectives of the course are to instill in students knowledge and skills on:

- Methods of penetrating inclined and cut trenches, the design of transport communication systems, its development from the beginning of the construction of the open pit to the last period of its operation.

Calculation of the volume of capital mining during the construction of an open pit, according to the terms of sinking and operation of capital and cut trenches.

- Formation of the design of working zones and its development from the

beginning of the construction of the open pit to the end of the development of horizontal, gentle, inclined and steeply dipping mineral deposits.

SHORT DESCRIPTION OF THE COURSE

The course "Carrying out mine workings in open pits" provides a presentation of the sections: Geological features of solid mineral deposits, trenches, types, classification of trenches. Methods for driving capital inclined, cut trenches, floor trenches with various excavation and loading equipment. Technological schemes for driving mine workings in the development of horizontal, gentle, inclined and steeply dipping mineral deposits at various stages of their operation. Parameters, passports of technological schemes.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

The study of this discipline will allow the student to apply the knowledge gained in solving practical engineering and technical problems of mine workings, different in difficulty, and prepare for the implementation of the technological part of the diploma project.

Array state management

CODE – MIN483

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

THE GOAL AND OBJECTIVES OF THE COURSE is aimed at familiarizing with the approaches and methods for solving the practical problems of geomechanics that miners face in their daily activities.

BRIEF DESCRIPTION OF THE COURSE Under the control of the state of the rock mass, it is necessary to understand the regulation of the nature and parameters of geomechanical processes in order to increase the safety of mining operations and their effectiveness. By regulating the development of geomechanical processes in the rock mass, they strive to achieve such a situation that the processes develop in a safe direction and their parameters are within the limits of pre-set safe values.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- know the conditions and patterns of manifestations of rock pressure, gas-dynamic phenomena, endogenous fires and other hazards; theory and mechanism of impact on the rock stratum of preparatory and treatment works;
- be able to select and calculate the main parameters of the methods for controlling the properties and condition of the rock mass; make the most effective technological solutions for specific mining and geological conditions.

Field development in special conditions

CODE – MIN484

CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose of the discipline is to teach the future specialist - a mining engineer the wide use of special methods of blasting, both in underground conditions and on the surface in various mining and geological, mining and cramped conditions. Making plans for the liquidation of the accident in underground work.

SHORT DESCRIPTION OF THE COURSE Allows you to more deeply study the issues of safe blasting and the design of explosive materials warehouses, which in the production environment will be met by future specialists often and they will have to solve these problems. A specific feature of the subject is that it pays more attention to determining the parameters of blasting operations ensuring the safety of blasting.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, the student must acquire and know:

- blasting methods depending on local conditions, ensuring the safety of blasting from flying pieces of rock mass;
- ensuring safety during storage of VM from lightning;
- determination of blasting parameters that can ensure safety, efficiency and necessary labor productivity during blasting operations.

Special drilling and blasting operations

CODE – MIN 485
CREDITS - 5 (2/1/0)
PREREQUISITE – MIN 442 Destruction of rocks by explosion

PURPOSES AND GOALS OF THE COURSE. The acquisition by students of the knowledge and skills necessary for the successful performance of work related to the use of modern technologies for drilling and blasting operations in mining and construction (dams, embankments, underground structures). The objectives of the course include: getting an idea of existing technologies for special drilling and blasting operations, the possibility of their application in specific conditions, making optimal decisions when applying these technologies.

SHORT DESCRIPTION OF THE COURSE. Influence of properties of rocks and other materials on destruction processes; explosion impulse as the main factor of destruction. Physical processes and geometric semblance of an explosion; assessment of the impact of the explosion on the rock mass and the environment. Technical and regulatory documentation for special blasting operations.

KNOWLEDGE, ABILITIES, SKILSS UPON COMPLETION OF THE COURSE. As a result of studying the course, students will gain knowledge on

substantiating the parameters of the influence of various physical factors on the indicators of technological processes in the extraction and processing of minerals, including in the development of resources of the shelf of the seas and oceans, as well as in the construction and operation of underground structures.

Student should know: calculate the parameters of the explosion; develop technical documents regulating the performance of blasting operations; determine the characteristic parameters of the destruction of rocks; control the compliance of the developed projects with the requirements of standards, technical specifications and other regulatory documents of industrial safety.

Student should be able to: improve existing and develop new resource-saving and environmentally friendly technologies for explosive mining of mineral raw materials, determine the quantitative and qualitative characteristics of crushing the massif; calculate the magnitude of the impulse of the explosive pressure of the explosive charges; develop technical and other documents regulating the order, quality and safety of blasting operations.

Construction of underground hydraulic structures

CODE – MIN 486

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose and task of studying this discipline is to develop students' knowledge and development of skills in conducting hydrological calculations in underground construction, necessary when designing hydraulic structures in close interconnection with environmental protection; familiarization with the types and designs of hydraulic structures for water supply and sanitation, discharge tunnels and methods for calculating them based on the current state of reservoirs and fixing methods used by progressive structures of hydraulic structures; formation of skills in working with normative literature; development of engineering thinking.

SHORT DESCRIPTION OF THE COURSE Selection of the main parameters affecting the hydraulic structures according to their intended purpose. The technical condition, the calculated characteristics of the materials and soil of the base of the reconstructed structures, and their elements should be determined by special studies.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Use when performing educational research analytical work, term papers, practical training and writing final qualification work.

The student should know: Methods of researching water resources and predicting them in time based on the current state of questions about the hydrological regime of reservoirs. Constructive solutions of various types of hydraulic structures

used in water supply and sanitation, ways to improve them.

The student should be able to: Independently choose methods of hydrological calculations in order to regulate the flow and determine the parameters of reservoirs. Conduct runoff monitoring data to determine estimated hydrological characteristics. Justify the design of hydraulic structures.

Geomechanics
CODE – MAP524
CREDIT - 5 (1/0/2)
PREREQUISITE – MAP519

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the course "Geomechanics" is the development of future mining engineers knowledge, skills and ideas necessary to solve the problems of geomechanical support of subsoil use.

The objectives of the course include: obtaining reliable operational information about the mechanical properties and the natural stress-strain state of the rock mass; clarification of the laws of development of deformation processes and the dependence of its parameters on the main influencing factors; development in it of the processes of deformation and fracture under the influence of natural and technological factors; monitoring the development of deformations of the earth's surface and protected objects with the aim of timely adoption of protective measures to prevent or reduce the harmful effects of mining while approaching the observed deformations to their permissible or limit values.

SHORT DESCRIPTION OF THE COURSE

The course contains a training program aimed at obtaining the theoretical basis for the movement of rocks in the underground mining of mineral deposits. It contains a full range of topics, according to the GOSO Model Curriculum, with a predominance of educating practical skills in monitoring the state of the massif with underground and combined mining systems.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: theoretical basic solutions for the problems of rock displacement during underground mining of mineral deposits; designing an observation station, conducting geomechanical monitoring of the subsoil; modern surveying instruments used to monitor surface and underground mine workings; mathematical processing of monitoring results using computer technology; graphical processing of monitoring results to obtain movement graphs.

The student should be able to: work with modern methods and means of monitoring the state of the rock mass; work with modern application software to work with data of various nature and purpose; solve geomechanics problems with

open, underground and combined methods of subsurface development; apply various anti-deformation methods and methods

Prospective and ongoing planning of open pit mining

CODE - MIN 487
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

Obtaining in-depth knowledge of the methods of prospective and current planning of open cast mining in relation to the peculiarities of the conditions for the development of solid mineral deposits.

SHORT DESCRIPTION OF THE COURSE

Fundamentals of prospective and current planning of mining operations in quarries. Mining geometric analysis of career fields. Mining mode. Mining and geometrical analysis of elongated quarry fields with inclined and steep fall of deposits according to the acad method. V.V. Rzhevsky. Mining-geometric analysis of the career field according to the method of prof. A.I. Arsentieva. Mountain geometrical analysis with horizontal and gentle deposits. Construction of schedules for the calendar distribution of mining volumes. Regulation of the mining regime and the calendar distribution of their volumes (recommendations of Acad. V.V. Rzhevsky). Determining the area of possible regulation of the mining regime by changing the slope angle of the quarry working sides (method by Prof. A.I. Arsentyev). Determination and averaging of the operating stripping coefficient according to the schedule V=f(P). Modern methods of economic evaluation of options for the regime and the mining schedule. The structure of the system of perspective and current planning of mining operations is the content of the mining plan. Information communications planning tasks. The contents of the mining plan. Fundamentals of the practice of forming mining plans.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should be able to: independently conduct prospective and ongoing planning of mining operations, taking into account the geological, technical, technological and economic conditions of field development.

Product quality management

CODE – MIN488
CREDIT - 3 (2/0/1)
Prerequisite - MIN101

GOAL AND OBJECTIVES OF THE COURSE Product Quality Management is

a special discipline forming a specialist - mining process engineer.

BRIEF DESCRIPTION OF THE COURSE Assessment of the level of product quality is a series of interrelated operations, including the selection of the range of quality indicators, the determination of their quantitative values and comparison with the baseline. In this case, the basic values of the product quality indicator are understood to mean such values that are taken as a basis for a comparative assessment.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- have an idea of mining science and the objects of its study;
- Features of methods for controlling the quality of ore during mining and their quantitative assessment;
- be able to use the knowledge gained in the study of subsequent special disciplines.

Technology and mechanization of filling works

CODE - MIN489
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN 101

PURPOSE AND OBJECTIVES OF THE COURSE Studying by students of technology and the procedure for the mechanization of laying work during the development of a deposit by underground method.

SHORT DESCRIPTION OF THE COURSE. Information about filling materials and methods of filling operations. Selection of filling materials. Methods of preparation and delivery of filling mixtures. Determination of strength characteristics of filling materials. Scope different bookmarks. Modern materials and additives to improve the characteristics of filling materials. Technology and mechanization of filling operations.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE.

- Know the basics of laying work and materials;
- be able to use the acquisition skills when choosing technologies and means of mechanization of laying works.

Special methods for developing uranium deposits

CODE – MIN490
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The aim of the discipline is to teach the future specialist special methods of

various mining and geological, mining and cramped conditions. Making plans for the liquidation of the accident in underground work.

SHORT DESCRIPTION OF THE COURSE

Currently, uranium ores are mainly developed by underground leaching. Uranium production is one of the sectors of the mining industry, technology and automation of technological processes.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

A further technical process in the technology of uranium mining and increasing the use of proven reserves in the subsoil is associated with this new method.

Design of blasting operations

CODE – MIN491

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN 442

THE PURPOSE OF STUDYING THE DISCIPLINE: is to train specialists in the field of blasting, mastering the basic principles of designing blasting operations in the mining industry.

SUMMARY: Requirements for documentation for the performance of blasting operations. The range of industrial explosives used in Kazakhstan and abroad. Design of blasting operations during the sinking of mine shafts; Design of blasting operations during the sinking of horizontal mine workings; Design of blasting operations during the sinking of inclined mine workings; Explosive technologies for underground ore mining; Methods for evaluating the effectiveness and quality of industrial explosives, Regulation of the degree of crushing of borehole and borehole charges. Preparation of BVR passports (projects). Technical and economic assessment of the BVR. Safety of blasting operations and the main measures to ensure it.

EXPECTED RESULTS: The student learns the design features of blasting operations performed in the mining industry.

Design for the construction of underground mining enterprises

CODE – MIN492

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN 101

GOAL AND OBJECTIVES OF THE COURSE

The purpose and objective of the discipline is the training of specialists in the field of mining, the acquisition by them of the necessary skills for independent practical activity. Mastering the scientific and practical foundations of designing the construction of underground structures.

SHORT DESCRIPTION OF THE COURSE

Methods of designing the parameters of individual underground objects are considered. Design methods and construction methods of the most complex objects of the mine and other underground structures (mine shafts, pairing the shaft with the mine yard, mine yard chambers). Calculation of the main and auxiliary processes in the construction of mining and underground structures. Methods of search and adoption of engineering, economic and organizational decisions on the construction of underground structures.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student acquires the following knowledge: - the principles of the feasibility study of the construction project of mining enterprises; mining design methods; drawing up a technical project of the facility; determining the estimated cost of the object; development of POR and PPR, as well as the preparation of a consolidated schedule for the construction of the facility. The student should be able to draw up a graduation project.

The student should know: to analyze in detail the essence and features of the design of underground complexes in the design of underground facilities of mining enterprises, the methods and stages of design, the composition of the design documentation and ways to determine the design parameters of the complexes.

The student should be able to: the ability to apply the obtained theoretical knowledge in the design process of underground complexes of mining enterprises.

Mine surveying of underground mining systems

CODE - MAP 525

CREDIT - 5 (1/0/2)

PREREQUISITE –MAP520

GOAL AND OBJECTIVES OF THE COURSE The purpose of teaching the discipline “Mine Surveying of Underground Mining Systems” is to train future specialists to carry out mine surveying services and monitor the correctness of mine workings with participation in drawing up mining development plans with the rational extraction of mineral resources from the bowels.

The student should have a good knowledge of all mining issues, especially underground mining systems, without which it is impossible to correctly solve mining problems with surveying support.

SHORT DESCRIPTION OF THE COURSE Underground workings are not available for direct visual perception. Therefore, to represent the mutual arrangement of underground mine workings and structures on the earth's surface, the shape of a mineral deposit, and geological disturbances, it is depicted on the plans and is carried out on the basis of surveying surveys. The mine surveying plan is, as it were, a mirror

of the mine's mining operations and serves as one of the main means of monitoring the correctness of mining operations. The mine survey plan provides an opportunity to establish the amount of extracted minerals and thereby verify the correctness of accounting for production at the mine. According to surveying data, mineral reserves are calculated and the completeness of its extraction from the subsoil is determined.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

In the study of this discipline, students will receive professional skills geometrically solving typical mine surveying tasks in relation to the conditions of the underground mining system.

Reclamation of disturbed lands in mining enterprises

CODE - MIN 493

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN 101

GOAL AND OBJECTIVES OF THE COURSE Obtaining in-depth knowledge of the methods of prospective and current planning of open cast mining in relation to the peculiarities of the conditions for the development of solid mineral deposits.

Study of technological schemes of reclamation, ways to improve reclamation work and reduce the environmental impact of open pit mining

SHORT DESCRIPTION OF THE COURSE Aspects of reclamation of disturbed lands in quarries. The importance of soil in the process of land reclamation. Landscape restoration work in open pit mining. Features of the selective formation of dumps taking into account the requirements of reclamation. Peculiarities of reclamation of the developed quarry space. Technical and economic assessment of land reclamation effectiveness. Comprehensive assessment of the condition of disturbed lands and recommendations for improving remediation work in quarries.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE Upon completion of the course

The student must know:

- Methods for the efficient use of natural resources and fruitful layers of the earth;
- The main environmental problems in the open development of mineral deposits;
- Ways of landfill reclamation;
- Fundamentals of land reclamation contaminated with heavy metals and toxic substances;
- Safety standards for land reclamation with spontaneously igniting rocks.

The student must be able to:

- Find ways to reduce the harmful effects of mining on the environment at the

design stage;

- Identify major environmental issues in quarrying.

Underground Mine Design

CODE – MIN494

CREDIT - 5 (2/0/1)

PREREQUISITE – MIN101

GOAL AND OBJECTIVES OF THE COURSE

Studying the basics of designing underground mining of mineral deposits, in particular, the basic documents governing the design and regulatory documents, principles of organization, types and procedures for performing design work.

SHORT DESCRIPTION OF THE COURSE

The course "Designing of underground mines" includes the following sections: general information about design, the composition of design documents, design stages, design software

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETING THE COURSE: As a result of studying this discipline, students should know and be able to:

- main types of projects and design documents;
- The main parameters and indicators of the project;
- choose and carry out calculations according to the method of opening and development; mineral deposits;
- choose and carry out calculations according to the development system;
- use software products for design.

Uranium Field Design

CODE – MIN501

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE Mastering the features, the procedure for the development, coordination and approval of the project for the development of uranium deposits by underground leaching.

SHORT DESCRIPTION OF THE COURSE

The course “Designing Uranium Deposits” includes the following sections: the main types of projects and design documents for the development of uranium deposits, the contents of the project of underground well leaching, design stages, software used in the extraction of uranium deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETING THE COURSE As a result of studying this discipline, students should know and be able to: main types of

projects and design documents in the development of uranium deposits; choose and carry out calculations according to the scheme of opening and development of uranium deposits; use software products for designing uranium deposits.

Construction technology of horizontal and inclined mine workings
CODE – MIN495
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The purpose and task of studying this discipline is to instill in students the knowledge and skills necessary for independent creative solving problems associated with the construction of horizontal and inclined mine workings for various purposes.

SHORT DESCRIPTION OF THE COURSE Definitions of the shapes of cross sections and the main parameters of horizontal and inclined mine workings for various purposes, as well as technological schemes for their construction in various mining and geological conditions. Technological operations: mine workings (rock mass destruction, loading and transportation of rock mass, mine workings fastening), as well as auxiliary production operations. Technical and economic assessment of construction methods for horizontal and inclined mine workings.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE Students should be able to independently design and determine technological schemes for the construction of horizontal and inclined mine workings in various geological conditions. Design the shape, the structural dimensions of the cross sections of the workings, choose the method of fastening the workings, and also develop special parts of the project.

The student should know: work with the necessary documentation, management methods and the appointment of underground horizontal and inclined workings.

The student should be able to: make calculations related to underground horizontal and inclined workings using regulatory documents and taking into account mining and geological horizons.

Subsoil geometry
CODE – MAP523
CREDIT - 5 (1/2/0)
PREREQUISITE - no

GOAL AND OBJECTIVES OF THE COURSE:
- disclose the basic concepts of the structure of geometrization and quality

indicators of the field;

- an in-depth study of the theoretical foundations of the geometrization of structural and qualitative indicators;
- to train in the use of structural and high-quality mining and geological graphs;
- teach to create volumetric graphs and models to characterize complex geological bodies.

SHORT DESCRIPTION OF THE COURSE The course contains a training program aimed at the totality of field observations, measurements, calculations and graphical constructions with the aim of geometric representation of the forms of mineral deposits, the conditions of their occurrence, etc. when solving mining and geological problems. It contains a full range of topics, according to the GOSO Model Curriculum, with a predominance of upbringing practical skills in working with data. The course is designed in such a way as to teach students the theoretical foundations of the field geometrization structure, as well as teach how to optimize processes, apply adequate methods for solving practical problems using modern methods and tools, automate routine processes, and be productive and efficient.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Students will know:

- the shapes and sizes of mineral deposits;
- conditions of occurrence of minerals;
- methods for determining and recording production;
- methods for calculating reserves and accounting for their movement in the development of deposits.

Students will be able to:

- know the geometrization of structural and qualitative indicators of deposits;
- be able to analyze theoretical aspects;
- determine the balance sheet and off-balance mineral reserves.

Design of ore and coal quarries

CODE - MIN 496

CREDIT - 5 (1/0/2)

PREREQUISITE - MIN 101

GOAL AND OBJECTIVES OF THE COURSE To provide the student with in-depth theoretical knowledge on the design of quarries, mastery of calculation methods for making optimal design decisions in relation to the peculiarities of the conditions for open development of solid mineral deposits.

SHORT DESCRIPTION OF THE COURSE Organization of the career design process. Source materials for design. Quarry design methods. Performance criteria for design decisions. Modern methods for evaluating design decisions. The main

parameters of the quarry; designing its contours. Designing the mining regime. Mining geometric analysis of career fields. Designing career performance. Construction of a schedule for field development. Areas of possible adjustments to the mining schedule. Designing complex mechanization of mining at a quarry. Designing a career opening. Designing a field development system. Requirements for the design of the master plan of a mining enterprise. Requirements for an environmental project.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: theoretical foundations and methods of designing open cast mining in the development of deposits occurring in various geological and natural conditions; the basics of dynamic phased design of mining enterprises; modern methods of economic evaluation of design decisions taking into account the time factor.

The student should be able to: independently conduct practical calculations of the main parameters of the quarry, parameters and indicators of technological complexes in their coordination, taking into account regulatory requirements for the rational use of mineral resources, environmental protection and compliance with safety regulations.

Mine Conservation

CODE – MIN497

CREDIT - 5 (2/0/1)

PREREQUISITE - MIN101

PURPOSE PURPOSE AND OBJECTIVES OF THE COURSE Studying by students of the order of conservation and liquidation of mining enterprises developing deposits underground.

SHORT DESCRIPTION OF THE COURSE Basic concepts, legislative acts and normative documents of the Republic of Kazakhstan related to the liquidation and conservation of enterprises, technical measures during the liquidation and conservation of enterprises, design basics and design decisions on technical processes and operations during the liquidation and conservation of enterprises, technical and economic indicators during the liquidation and conservation of enterprises underground mining of mineral deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The student should know: the main documents: “The Law of the Republic of Kazakhstan on Subsoil and Subsoil Use”, “Instruction on the Procedure for the Elimination and Conservation of Enterprises for the Extraction and Processing of Minerals”, “Safety Requirements for the Development of Ore, Non-Metallic and Alluvial Deposits by Underground Method”, “Unified rules for the protection of

mineral resources in the development of mineral deposits in the Republic of Kazakhstan".

Uranium deposits conservation
CODE – MIN498
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE The main problems of underground mining at the present stage.

SHORT DESCRIPTION OF THE COURSE The main legislative acts and regulatory documents of the Republic of Kazakhstan relating to the liquidation and conservation of enterprises, technical measures during the liquidation and conservation of enterprises, the basics of design and design decisions on technical processes and operations during the liquidation and conservation of enterprises, technical and economic indicators during the liquidation and conservation of enterprises for underground mining mineral deposits.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE The reason for conservation is changes in the mining, geological, hydrogeological or technical and economic conditions of the development of the field: for example, a change in state condition for the developed mineral, the absence of consumers for it.

Reconstruction of mines and underground structures
CODE – MIN499
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The main goal and objective of the discipline is to instill in students the knowledge and skills necessary for independent creative solving problems associated with the implementation of technological processes in the construction, reconstruction and operation of mines and underground structures.

SHORT DESCRIPTION OF THE COURSE General information on the reconstruction of mining enterprises. Types of work and capital costs, definition of concepts: expansion of existing enterprises, reconstruction, technical re-equipment, maintenance of existing facilities. Goals and reasons for the reconstruction. The main directions of reconstruction. Types of reconstruction of mines. The rationale for the reconstruction. Opening up new horizons. Deep vertical trunks. Repair, restoration and repayment of mine workings. Choosing a mining reconstruction scheme. Reconstruction of underground metro structures.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

As a result of studying the discipline, the student acquires the following knowledge: - the main goals and content of the project of the mining enterprise, the sequence and scope of work during the construction of the mine, modern technologies for the construction of workings for various purposes in ordinary and complex mining and geological conditions; goals, causes and main directions of reconstruction of mines; the most commonly used types of reconstruction; methods for opening new horizons and methods for deepening mine shafts; technology for repair, restoration and repayment of mine workings.

The student should know: the basis of construction and installation work during the reconstruction of underground structures and the deepening of vertical mine shafts, methods of opening new horizons; technology for repair, restoration and repayment of mine workings.

The student should be able to: develop technological passports of the mine workings, including - determine the main technical parameters of the mine workings; determine the parameters of the driving cycle; solve labor organization issues; navigate in the scientific and technical literature on the technology of construction and reconstruction of mining enterprises.

Surveying Software

CODE - MAP 527

CREDIT - 5 (1/0/2)

PREREQUISITE - MAP 519

GOAL AND OBJECTIVES OF THE COURSE

The purpose of the course is to familiarize and train students in the methods and methods of topographic mapping of objects and phenomena in the digital information processing system, creating and updating topographic plans for automated technology in the interests of the national economy, for research and environmental protection and natural resources.

The main objective of the discipline is to achieve compliance with the level of education of students with qualification characteristics.

SHORT DESCRIPTION OF THE COURSE

The course contains a training program giving basic concepts and teaching methods and methods for displaying objects and phenomena, obtaining spatial data by geodetic measurements, creating the base of the base map, using the attributes to give the map the required specificity of the latest generation GIS, in addition to the traditional georelational data model, use a new object Oriented geodata model. It provides work with real objects, and not just records in the database, and allows you to configure objects by setting methods for managing them in advance.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Students will know:

- understand the ideology of GIS and their place among other studied disciplines;

- possess theoretical knowledge about the structure of GIS and their components, about the basic principles of GIS functioning, about the analytical capabilities of modern GIS;

Students will be able to work with GIS technology programs in land management.

Open pit mining systems

CODE - MIN 500

CREDIT - 5 (1/0/2)

PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE

The goal is to study the theory and practice of mining in quarries, mastering the calculation methods of making technological decisions in relation to the geological features of solid mineral deposits.

The objectives of the course are to instill in students knowledge and skills in:

- Methods of sinking open inclined and split trenches, design of transport communications systems, its development from the beginning of the construction of the quarry to the last period of its operation;

-Calculation of the volume of mining and capital works during the construction of the quarry, the terms of penetration and operation of capital and cut trenches;

- Formation of the design of working areas and its development from the beginning of the construction of the quarry to the end of the development of horizontal, gentle, inclined and steeply dipping mineral deposits.

SHORT DESCRIPTION OF THE COURSE

The course "Conducting mining in quarries" gives an account of the sections: Geological features of solid mineral deposits, trenches, types, classification of trenches. Methods of driving capital inclined, split trenches, half trenches with various mining and loading equipment. Technological schemes for mining in the development of horizontal, gentle, inclined and steeply dipping mineral deposits at various stages of their operation.Parameters, passports of technological schemes.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

The study of this discipline will allow the student to apply the knowledge gained in solving various engineering and technical problems of mining workings of varying difficulty and will prepare for the implementation of the technological part of the graduation project.

Underground development of seam deposits
CODE - MIN 441
CREDIT - 5 (2/0/1)
PREREQUISITE - MIN101

GOAL AND OBJECTIVES OF THE COURSE Industrial characteristic, the concept of ore conditions. the study of a special discipline, forming a specialist - mining engineer-technologist, expanding and deepening students' knowledge on the issues of opening and preparing mine fields, systems for developing reservoir deposits for various mining and geological and mining conditions.

SHORT DESCRIPTION OF THE COURSE Types and structure of primary and placer deposits. Water availability and permafrost. The nature of the distribution of useful components and the testing of placers. Onboard content. Features of underground mining placers. Opening and preparation of primary and alluvial deposits. Mine fields and the procedure for their development.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

- know general information about reservoir deposits, methods of underground mining of mineral deposits; be able to use the knowledge gained in the study of subsequent special disciplines.

Underground mining of primary and alluvial deposits
CODE - MIN 432
CREDIT – 5 (2/0/1)
PREREQUISIT - MIN101

PURPOSE AND OBJECTIVES OF THE COURSE Industrial characteristics, the concept of ore conditions. study of a special discipline that forms a specialist - a mining engineer-technologist, expansion and deepening of students' knowledge on the issues of opening and preparation of mine fields, systems for developing stratal deposits for various mining and geological and mining technical conditions.

SHORT DESCRIPTION OF THE COURSE

Types and structure of primary and placer deposits. Water content and permafrost. Distribution of useful components and sampling of placers. Onboard content. Features of underground mining of placers. Opening and preparation of primary and placer deposits. Mine fields and the order of their development.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

- know general information about stratal deposits, methods of underground mining of mineral deposits; be able to use the knowledge gained in the study of subsequent special disciplines.

Technology for the construction of urban underground structures
CODE - MIN 433
CREDIT - 5 (2/0/1)
PREREQUISITE – MIN101

GOAL AND OBJECTIVES OF THE COURSE:

To instill in students the knowledge and skills necessary for independent creative solving problems related to the implementation of technological processes for the construction of urban underground structures for various purposes; to teach creatively apply advanced equipment and technology, seeking to increase the pace of construction and labor productivity, improve the quality of work, reduce costs and rational use of labor resources.

SHORT DESCRIPTION OF THE COURSE

Selection and calculation of structures of urban underground structures, fixing workings, the preparatory period for construction, construction of shafts, technology and organization of construction of approach and inclined workings, technology and organization of construction of distillation tunnels using mining shields, technological schemes for building metro stations, construction of three-vault metro stations, construction metro stations with advanced support and NATM elements, construction of metro facilities open method, the technology of building underground passages with the help of squeezing plants and microboards, the technology of building collector tunnels, the technology of building road junctions, the technology of building underground garages and other workings of large cross section.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE After graduation, the student will master the knowledge of choosing an effective technology for the construction of urban underground structures, independently draw up projects for the construction of subways, underground parking and pedestrian crossings.

The student should know: the purpose and location of the workings in the space and plan of the city, technological schemes for the workings in various mining and geological conditions; types of temporary supports and lining and the technology of their construction; advanced mining equipment and the principle of its work; main and auxiliary processes in the construction of underground structures.

The student should be able to: independently and justifiably choose and calculate the necessary lining of the underground structure, and if necessary, temporary support, design the shape and size of the cross section of the underground mine workings, select the engineering and technology for the construction of the urban underground structure, search and make engineering, economic and organizational decisions and justify their adoption.

Mine surveying in the construction of tunnels
CODE – MAP526
CREDIT - 5 (1/2/0)
PREREQUISITE – MAP519

GOAL AND OBJECTIVES OF THE COURSE

The aim of this course is to acquire theoretical and practical knowledge, allowing, taking into account modern requirements, to carry out a full range of surveying work in the construction of tunnels in a qualified and timely manner.

The objectives of the course include: To acquaint students with the main tasks of surveying support for the construction of tunnels and subways, their specifics, production methods, technical means, etc.; To acquaint students with the generally accepted methods of mine surveying in the world, the main provisions of regulatory documentation, on a number of well-known and constructed tunnels show the significance and uniqueness of the work; Teach students practical skills in calculating and designing the basic elements necessary for the removal of constructions projects in the nature and reporting documentation accompanying the adoption of facilities in operation.

SHORT DESCRIPTION OF THE COURSE

The tasks of surveying support during the construction and reconstruction of underground metro structures, the composition of project documentation for construction, the sequence of surveying work when transferring the project to nature, the main breakdown work, surveying control over the ratio of the geometric elements of the structures established by the project, compiling executive documentation, surveying accounting of the volumes of the main construction work.

KNOWLEDGE, SKILLS, SKILLS FOR COMPLETION OF THE COURSE

Students will know: the composition and content of project documentation for construction; types of surveying work in the construction of tunnels and subways; methods and methods for performing surveying work in the construction of tunnels and subways.

Students will be able to: work with project surveying graphic documentation; perform surveying work to ensure the construction of tunnels and subways; conduct reporting graphical documentation during the construction process; apply the knowledge and practical skills in surveying support for the construction of other underground structures for various purposes.

13 Defense of thesis / diploma project
CODE – ECA 003, 103

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 production problems, as well as cultural tasks;

2) the development of independent work skills and mastery of the methodology of scientific research and experimentation in solving developed problems and issues;

3) elucidation of 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 the defense of the thesis (project) is determined by the Rules for conducting current control 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 defense of the thesis (project) is carried out at an open meeting of the state certification 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. A scientific adviser, representatives of the organization, on the basis of which a diploma study and other interested parties can be invited, can also be invited to defense. The duration of the defense of one thesis, as a rule, should not exceed 30 minutes per student. To protect the thesis, the student makes a report to the state certification commission and those present no more than 15 minutes. Everyone present in the form of questions or speeches can participate in the discussion of the thesis (project). After discussion, the secretary of the commission reads a review (in case of presence, the supervisor can speak in person) and a review. If there are comments in the recall and / or review, the student should give a reasoned explanation of their nature. Based on the results of the defense of the thesis (project), an assessment is made according to a point-rating letter system. In this case, the level of theoretical, scientific and practical training, the opinion of the supervisor and the reviewer's rating are taken into account.

The results of the defense of the thesis are documented by the minutes of the meeting of the state certification commission individually for each student and announced on the day of the defense.

Educational geodetic practice

CODE - AAP 101

CREDIT - 2

PRE-REQUISIT – no

PURPOSE AND OBJECTIVE OF THE COURSE

The purpose of passing educational geodetic practice of students is:

- obtaining familiarization professional competence;
- mastering practical skills and abilities to work with devices, consolidation of theoretical knowledge gained during training;
- development of skills in conducting independent work, calculation and graphic work, as well as skills in drawing up reports;
- Ability to work in a team, perform joint field work, report protection.

SHORT DESCRIPTION OF THE COURSE

Educational geodetic practice is carried out for 1st year students, on the territory of the educational organization, training grounds. Methodical and material preparation of training practical lessons is carried out by the teacher leading this practical lesson.

Attendance and registration of the progress of educational practice is recorded by the teacher, upon completion of the educational practice, the student is given an assessment.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

As a result of passing educational geodetic practice, students acquire primary knowledge in the field of geodesy.

acquire skills: conducting business correspondence, acquiring practical skills in performing calculations and drawing up reports.

acquires skills: work with geodetic instruments in the field, work progress, team work, report protection.

Industrial practice I, II

CODE - AAP 109.158

CREDIT - 6

PRE-REQUISIT - no

GENERAL

Brief mining and geological characteristics of the deposit.

The origin of the deposit. Occurrence and position in space. The size of the deposit. Geological exploration drilling technique, its processing. Accepted exploration and sample handling technique. Characteristics of the mineral and host rocks: strength, stability, fracturing, water content, the presence and nature of the interlayer, textural features. Graphic material - geological map. Several cuts.

PURPOSE AND OBJECTIVES OF PRACTICE

The purpose of the practice is to familiarize students with the work of a mining enterprise and to consolidate theoretical knowledge obtained in both general engineering and special disciplines.

The tasks of the practice are to study and familiarize themselves with

technology, mechanization, automation and organization of work in tunneling and working faces. To get acquainted with the general plan of the surface, methods of processing (concentration and metallurgical processing) of the ore mass. To study the forms of organization and remuneration of labor, as well as technical and economic indicators of the mine. At the end of the internship, the student takes an exam for a working profession.

ORGANIZATION OF PRACTICE

The student is sent to the RAP for a period of three weeks.

The distribution of students to the practice bases is formalized by an order for the institute no later than one month before the start of the practice.

Before leaving for practice, students must receive a ticket at the department, a form of a diary, in the library - practice programs and be instructed on the procedure for passing practice, general instructions on industrial safety.

During practice, the student is obliged to fully comply with the internal rules of the enterprise.

A student who has not completed the internship program, received a negative review or an unsatisfactory assessment when defending the report, undergoes internship again during the holidays or by order of the rector is sent to production for a period of one year. In some cases, the issue of expulsion from the institute or transfer to a junior course may be considered.

FEATURES OF THIS TYPE OF PRACTICE

The student studies and gets acquainted with such major issues of mining as the geology and hydrogeology of the deposit, capital, operational and exploratory workings, their purpose, the size of the opening and ventilation scheme, methods of preparing the mine field, used

Form and type of reporting (diary, report, etc.) of students on internship

The practice report is drawn up directly at the mine in full compliance with the content set out in the program. The textual part of the report is presented on paper of standard size 29.5x20 cm in the amount of 30-35 handwritten pages.

The report should, in addition to the description, the content of the scheme and a brief description of the equipment and mechanisms. Descriptive partroduction processes should be sufficiently complete, and, if possible, with critical remarks to them, and reflect the state of safety at the given enterprise.

The report should also contain the main technical and economic indicators for the main technological mining processes and actual data on the productivity of mining machines and mechanisms. These materials are collected by students directly from the faces as a result of observing the relevant production processes (drilling holes and wells, delivery, loading rocks, etc.).

The report is defended at the enterprise before the commission.

Рецензия

на образовательную программу высшего образования по направлению подготовки «Горная инженерия» Бакалавр техники и технологий в области горного дела, разработанную кафедрой «Горное дело» Казахского национального исследовательского технического университета им. К.И. Сатпаева

Рецензируемая образовательная программа представляет собой систему документов, разработанную в соответствии с ГОСО высшего образования 2018 года

Образовательная программа учитывает производство горных работ открытым, подземным способами, геотехнологию разработки урановых месторождений (ПСВ урана), строительство шахт и подземных сооружений, маркшейдерское дело. В зависимости от траектории обучения учитываются современные тенденции развития горного производства в рыночных условиях и содержит цель и задачи программы, объекты и виды профессиональной деятельности, учебный план, дескрипторы уровня и объема знаний, умений, навыков и компетенций.

Дисциплины учебного плана по рецензируемой образовательной программе формируют весь необходимый перечень общепрофессиональных и профессиональных компетенций в области горного дела.

Качество содержательной составляющей учебного плана не вызывает сомнений. Включенные в план дисциплины раскрывают сущность актуальных на сегодняшний день проблем, структура плана логична и последовательна. Оценка аннотированных рабочих программ учебных дисциплин позволяет сделать вывод, что содержание дисциплин соответствует компетентностной модели выпускника. Образовательная программа наглядно демонстрирует использование активных и интерактивных форм проведения занятий, включая дискуссии, деловые игры, разбор конкретных ситуаций и

предусматривает профессионально-практическую подготовку обучающихся в виде практики, а именно учебная практика, производственная практика. Содержание программ практик свидетельствует об их способности сформировать практические навыки студентов.

Анализ программ дисциплин и практик показал, что при реализации программы используются разнообразные формы и процедуры текущего контроля и промежуточной аттестации.

К несомненным преимуществам образовательной программы следует отнести ее соответствие современному уровню развития науки, техники и производства.

В целом, рецензируемая образовательная программа, отвечает требованиям и основным требованиям профессиональных стандартов и способствует формированию общепрофессиональных и профессиональных компетенций по направлению подготовки «Горная инженерия».

Член Совета директоров АО
«Горно-металлургический концерн Казахалтын»,
Эксперт ТОО «Корпорация Казахмыс»,
Академик НИА РК, д.т.н., профессор, М.Ж.Битимбаев

ОТЗЫВ

на образовательную программу **«ГОРНАЯ ИНЖЕНЕРИЯ»**
бакалавра техники и технологии в области горного дела

Рецензируемая образовательная программа (ОП), реализуется в НАО «Казахский национальный исследовательский технический университет имени К.И. Сатпаева» по специальности **«Горная инженерия»**по направлениям (специализациям): Открытые горные работы; Подземная разработка полезных ископаемых; Разрушение горных пород и шахтное строительство; Скважинная добыча урановых месторождений.

ОП представляет собой систему документов, разработанную КазНИТУ имени К.И.Сатпаева с учетом требований рынка труда на основе государственного образовательного стандарта высшего образования РК по вышеперечисленным направлениям.

ОП регламентирует цели, ожидаемые результаты, содержание, условия и технологии реализации образовательного процесса, оценку качества подготовки выпускника по данному направлению подготовки и включает в себя: учебный план, программы учебных дисциплин и другие материалы, обеспечивающие качество подготовки обучающихся, а также программы, объекты учебной и производственной практик, обеспечивающие реализацию образовательной технологии.

Четко обозначены объекты и виды будущей профессиональной деятельности выпускника: организационно-управленческая, производственно-технологическая,экспериментально-исследовательская, расчетно-проектная и аналитическая. Расписаны профессиональные задачи в соответствии с видами профессиональной деятельности.

В образовательной программе бакалавриата предусмотрено, вне зависимости от формы обучения, применение образовательных технологий, реализации программы бакалавриата по индивидуальному учебному плану, в том числе ускоренного обучения.

В ОП достаточно полно раскрыты дескрипторы уровня и объема знаний, умений, навыков и компетенций требований для завершения обучения и получение диплома и академической степени «Бакалавр техники и технологий».

Освоение перечня учебных дисциплин, изложенных в данной ОП позволит

выпускнику обрести знания и умения в области разработки месторождений твердых полезных ископаемых, охватывающих вышеперечисленные направления подготовки.

Изложенное позволяет сделать вывод, что разработанная образовательная программа по направлению 6В072 – Производственные и обрабатывающие отрасли «Горная инженерия» бакалавра техники и технологии в области горного дела может быть одобрена и рекомендована для ее реализации в НАО «КазНИТУ им. К.И. Сатпаева» при их подготовке.

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РЕЦЕНЗИЯ

на образовательную программу **6В07205 «ГОРНАЯ ИНЖЕНЕРИЯ»** группа **В071 ГОРНОЕ ДЕЛО И ДОБЫЧА ПОЛЕЗНЫХ ИСКОПАЕМЫХ** бакалавра техники и технологии в области горного дела

составленной кафедрой «Горное дело» Satbayev University

Рецензируемая образовательная программа (далее ОП) по научно-педагогическому направлению представляет собой систему документов, разработанную Satbayev University с учетом требований рынка труда на основе Государственного образовательного стандарта послевузовского образования РК.

Содержание образовательной программы бакалавриата состоит из: теоретического обучения, включающее изучение циклов базовых и профилирующих дисциплин; различные виды практик, включающие выполнение дипломной работы.

В соответствии с требованиями рынка достаточно полно составлен паспорт специальности и матрица компетенций образовательной программы. Четко обозначены объекты и виды будущей профессиональной деятельности выпускника.

В ОП достаточно полно раскрыты цели, задачи, требования к уровню подготовки бакалавра на основе Дублинских дескрипторов высшего образования и отражают освоенные компетенции, выраженные в достигнутых результатах обучения, компетенции по завершению обучения.

Таким образом, содержание ОП «Горная инженерия» разработана на основе развития многоуровневой системы подготовки кадров, фундаментальности и качества обучения, непрерывности и преемственности образования и науки, единства обучения, воспитания, исследовательской и инновационной деятельности, направленной на максимальное удовлетворение запросов работодателей.

Освоение настоящей ОП позволит выпускнику обрести углубленные знания и умения первого уровня (бакалавриата) в области горного дела, а ВУЗу подготовить высококвалифицированных кадров высшей квалификации.

Вышеизложенное позволяет сделать вывод, что разработанная образовательная программа группы **В071 ГОРНОЕ ДЕЛО И ДОБЫЧА ПОЛЕЗНЫХ ИСКОПАЕМЫХ / 6В07205 «ГОРНАЯ ИНЖЕНЕРИЯ»** бакалавра техники и технологии в области горного дела составленной кафедрой «Горное дело» может быть одобрена и рекомендована для ее реализации в НАО «Satbayev University» при их подготовке.

Вице президент

АО "АК Алтыналмас" **Б.Бахрамов**