Non-Public JSC "Kazakh National Research Technical University named after K. Satpaev"
Institute of Architecture, Construction and Energetics named after TK Basenov
Department of Building and construction materials

CURRICULUM PROGRAM

6B07118 "Transport facilities"
Bachelor of Engineering and Technology
in area B166-Transport facilities

Almaty, 2022

Программа составлена и подписана сторонами:

от КазНИТУ им.К.И.Сатпаева:

1. Заведующий кафедрой СиСМ Наширалиев Ж.Т.
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3. Председатель УМС кафедры СиСМ Акмалаев К.А.
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От работодателя:

1. Представитель Совета от работодателей Зам.начальника Алматинской дистанции пути ПЧ-46 К.Н.Капсамалатов

Утверждено на Академическом совете Сатбаев университета. Протокол № 8 от 16.05.2022 г.

Brief description of the program

The field of professional activity can be the following industries: transport and communication, construction, oil and gas, engineering, chemical, manufacturing, industry.

The objects of professional activity are: construction and installation departments and organizations of transport construction, research and design institutes, in metro and road construction organizations, in centers for diagnosing the operational state of bridge and tunnel structures, as managers of construction and installation works. oil and gas enterprises, enterprises for the repair of road construction machinery and equipment, joint-stock associations for the construction of bridges and gas and oil pipelines, laboratories for technical diagnostics of pipelines, gas and oil pipelines, for quality control and certification of building materials and products.

Subjects of professional activity: organization and conduct of construction work, organization and conduct of work on the operation of bridges and gas and oil pipelines and technical equipment, work in research organizations under the guidance of leading experts, organization, planning and management in bridge and tunnel construction.

Types of professional activity. Bachelors by specialty "Transport facilities" can perform the following types of professional activities:

- carrying out construction and installation work on the construction, operation and reconstruction of bridges and gas and oil pipelines, gas and oil storage facilities, transport facilities; for the operation and repair of road-building machines, mechanical, electrical equipment and automation equipment; technological lines for the production of road building materials and products;
- design and development - to carry out design and development work on the construction and reconstruction of transport facilities, technical structures, engineering systems, mechanical and electrical equipment.
- design and survey - to organize and carry out work on engineering-geological, engineering-geodetic surveys in the design of transport construction facilities, highways, airfields, bridges and tunnels;
- organizational and technological - to organize the work of construction, production organizations and transport construction enterprises;
- scientific and pedagogical - to participate in the implementation of research work and conduct scientific and pedagogical activities in educational organizations.

Areas of professional activity: design, construction and operation of transport construction and technical facilities, production of road building materials, products and structures.

The content of professional activity: make calculations of elements of bridge structures of transport construction, draw up technical solutions, participate in the development of technical specifications for the construction and reconstruction of transport construction objects, taking into account the requirements of ecology and life safety, perform construction and installation work, develop options for a bridge structure; technology for the production of works in the construction of bridge structures and gas and oil pipelines and gas and oil storage facilities.

Entry Requirements

Admission of applicants to higher educational institutions is carried out on applications on a competitive basis in accordance with the points of the certificate issued on the basis of the results of the unified national testing (UNT) or integrated testing (CT), conducted by the technologies developed by the National Testing Center (NTC) of the MES RK, on the basis of Model rules for admission to studies in educational organizations that implement vocational curricula for higher education, approved by a decree of the Government of the Republic of Kazakhstan on "19» January 2012 No. 111 (with changes and additions as of 07/04/2014). The applicant must have a state document on secondary (full) general education or secondary vocational education.The specialty 6B07118" Transport facilities" at the Kazakh National Research Technical University named after K. Satpayev enrolls graduates of secondary education of the current year, who have passed the UNT and participants of complex testing, who scored at least 70 points according to test results.

Applicants are tested in the following subjects:the state or Russian language (language of instruction), history of Kazakhstan, mathematics and physics. Students are enrolled in the event that they receive at least 7 points in mathematics, and in other subjects at least 4 points. In the case of receiving one of the subjects passed under the UNT or integrated testing, less than 4 points, persons are not allowed to enroll in paid education or participate in the competition for the award of educational grants.

Code	Type of competence	Competency description	Result of competence	Responsible
GENERAL (It implies full training with possible additional depending on the level of knowledge)				
G1	Communication skills	- Fluent mono-speaking oral, written and communication skills - ability not fluent communication with a second language - Ability to use communicative communication in different situations - there are the basics of academic writing in their native language - language level diagnostic test	Full 4-year education with the development of at least 240 academic credits (of which 120 contact academic lending) with the possible transfer of credits in the second language where students have an advanced level. The language level is determined by taking a diagnostic test.	Department of Kazakh and Russian, Department of English
G2	Math literacy	- Basic mathematical thinking at the communication level - the ability to solve situational problems based on the mathematical apparatus of algebra and began mathematical analysis	Full 4-year study with the development of at least 240 academic credits (of which 120 contact academic lending). If the diagnostic test is passed positively, the level is Mathematics 1, if it is negative, the level is Algebra and the analysis is started	Department of Math

		- diagnostic test for mathematical literacy in algebra		
G3	Basic literacy in science education	- basic understanding of the scientific picture of the world with an understanding of the essence of the fundamental laws of science - understanding of the basic hypotheses, laws, methods, formulation of conclusions and evaluation errors	Full 4-year study with the development of at least 240 academic credit (including contact 120 auditory academic credits). When the positive delivery of diagnostic test level 1 Physics, General Chemistry, with a negative - the level of early physics and basic fundamentals of chemistry	Chair in the field of science
SPECIFIC (Implies abbreviated training at the expense of credit transfer, depending on the level of knowledge on competencies for graduates of 12-year-olds in schools, colleges, high schools, including the humanitarian and economic trends)				
S1	communicative	- Runaway bilingual oral and written communication skills - the ability to communicate with not fluent in a third language - skills in writing texts of various style and genre - skills of understanding and interpretation of his own work a certain level of complexity (the essay) - basic theoretical and aesthetic literacy as a condition of full perception, interpretation of the original text	Full credit transfer for languages (Kazakh and Russian)	Chair of Kazakh and Russian language
S2	Mathematical literacy	- Special mathematical reasoning using deduction and induction, generalization and concretization, analysis and synthesis, classifying and organizing, and abstracting analogy - the ability to formulate, validate and prove the situation - application of general mathematical terms, formulas, and the extended spatial perception to mathematical problems	Perezachet credits on discipline Mathematics (Calculus) I	Department of Math

		- a thorough understanding of the basics of mathematical analysis		
S3	Special literacy in natural sciences (Physics, Chemistry, Biology and Geography)	- Extensive scientific perception of the world, is now intended to deeper understanding of natural phenomena - critical perception for understanding scientific phenomena of the world - cognitive ability to formulate a scientific understanding of the forms of existence of matter, its interactions and occurrences in nature	ECTS in Physics I, General Chemistry, General Biology, Introduction to geology, introduction to geodesy; Teaching practice, etc.	Chair in the field of science
S4	English	- readiness to further self-education in the English language in various fields - the willingness to acquire experience in the design and research work using English	Perezachet English loans above the level of the academic to the professional (15 credits)	Department of English
S5	Computer skills	- Basic programming skills on a modern language - the use of software and applications for training in various disciplines -availability global certification standard for the level of language	ECTS in the discipline Introduction to Information and Communication Technology, Information and Communication Technologies	Department of Software Engineering
S6	Social and humanitarian competence and behavior	- understanding and awareness of the responsibility of each citizen for the development of the country and the world - The ability to discuss the ethical and moral aspects of society, culture and science	Credit Transfer on Modern History of Kazakhstan (except for state exam)	The department of social sciences
		- critical awareness and the ability to debate for debating on current scientific hypotheses and theories	ECTS philosophy and other humanities	
PROFESSIONAL (implies abbreviated training at the expense of credit transfer, depending on the level of knowledge on competencies for college graduates, AB schools and universities, including the humanitarian and economic trends)				
P1	professional competence	- critical perception and deep understanding of professional	ECTS on basic professional disciplines, including an	producing department

		competences at the level of 5 or 6 - The ability to discuss and debate on professional issues in the framework of implementation of the program	introduction to the profession, the structure and design of machines and systems for industry, servicing of machines for industry educational and industrial practice	
P2	general engineering competence	- basic general engineering skills and knowledge, the ability to solve general engineering tasks and problems - be able to use software packages for the analysis of experimental data, solving systems of algebraic and differential equations	ECTS of engineering disciplines (engineering graphics, descriptive geometry, basics of mechanics, fluid dynamics basics, basics of electrical engineering, microelectronics bases, fundamentals of thermodynamics, basics of geology, etc.)	producing department
P3	Engineering and computer competence	- the basic skills to use computer programs and softsistem solutions for general engineering tasks	Credit transfer in the following disciplines of computer graphics, the basics of CAD, CAE basics etc.	producing department
P4	Engineering and operational competence	- the skills and ability to use technical means and experimental tools for solving general engineering tasks	ECTS academic disciplines pilot areas: turning, plumbing, repair business, welding business, laboratory or analytical chemistry, laboratory physics, mineralogy, etc.	producing department
P5	Socio-economic competence	- Critical understanding and cognitive ability to reason by modern social and economic issues - Basic understanding of economic evaluation of the objects of study and profitability of the sector projects	ECTS for socio-humanitarian, technical and economic subjects in elective credit cycle	producing department

University may refuse to credit transfer is confirmed if the low level of diagnostic or subjects completed the final grades were lower than A and B.

Requirements for completion of training and a diploma

- *Description of mandatory standard requirements for graduation and awarding academic degrees of Bachelor of engineering and technology in the field of* construction and operation of transport facilities: the development of at least 240 academic credits of theoretical training and the final thesis.

Working curriculum of the educational program

SATBAYEV UNIVERSITY

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

APPROVED
Chairman of the Management Board-
Rector of Kaznitu named after K.Satpayev
M.M. Begentaev
_______ 2022 y.

CURRICULUM
of Educational Program on enrollment for 2022-2023 academic year

Educational program 6B07118 - "Transport facilities"
Group of educational programs B166 - "Transport facilities"

Form of study: full-time **Duration of study: 4 years** **Academic degree: Bachelor of Engineering and Technology**

Discipline code	Name of disciplines	Cycle	Total amount in credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in	Form of control	Allocation of face-to-face training based on courses and semesters							
								I course		II course		III course		IV course	
								1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 semester	8 semester
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)															
M-1. Module of language training															
LNG108	English language	GED, RC	10	300	0/0/6	210	Э	5	5						
LNG104	Kazakh (Russian) language	GED, RC	10	300	0/0/6	210	Э	5	5						
M-2. Module of physical training															
KFK101-104	Physical Culture	GED, RC	8	240	0/0/8	120	Difcredit	2	2	2	2				
M-3. Module of information technology															
CSE677	Information and communication technologies (in English)	GED, RC	5	150	2/1/0	105	E				5				
M-4. Module of socio-cultural development															
HUM100	Modern History of Kazakhstan	GED, RC	5	150	1/0/2	105	SE		5						
HUM132	Philosophy	GED, RC	5	150	1/0/2	105	E				5				
HUM120	Socio-political knowledge module (sociology, politology)	GED, RC	3	90	1/0/1	60	E				3				
HUM134	Socio-political knowledge module (culturology, psychology)		5	150	2/0/1	150	E			5					
M-5. Module of anti-corruption culture, ecology and life safety base															
HUM133	Fundamentals of anti-corruption culture	GED, CCH	5	150	2/0/1	150	E			5					
MNG488	Fundamentals of Entrepreneurship and Leadership														
HYD438	Ecology and life safety														
CYCLE OF BASIC DISCIPLINES (BD)															
M-6. Module of physical and mathematical training															
MAT101	Mathematics I	BD, UC	5	150	1/0/2	105	E	5							
PHY468	Physics	BD, UC	5	150	1/1/1	105	E	5							
MAT102	Mathematics II	BD, UC	5	150	1/0/2	105	E		5						
M-7. Basic Training module															
GEN429	Engineering and computer graphics	BD, UC	5	150	1/0/2	105	E	5							
CIV782	Introduction to transport construction	BD, UC	4	120	1/0/2	75	E	4							
2201	Elective	BD, CCH	5	150		105	E		5						
2202	Elective	BD, CCH	6	180		135	E			6					
CIV946	Building Mechanics I	BD, UC	5	150	1/0/2	105	E				5				
2203	Elective	BD, CCH	5	150		105	E			5					
2204	Elective	BD, CCH	5	150		105	E			5					
CIV100	Building structures	BD, UC	5	150	2/0/1	105	E				5				
2205	Elective	BD, CCH	5	150		105	E					5			
2206	Elective	BD, CCH	5	150		105	E				5				
SAF149	Occupational health and safety at industry	BD, UC	5	150	1/0/2	105	E					5			
2208	Elective	BD, CCH	5	150		105	E					5			
2209	Elective	BD, CCH	5	150		105	E					5			
2210	Elective	BD, CCH	4	120		75	E					4			
2211	Elective	BD, CCH	5	150		105	E					5			
2212	Elective	BD, CCH	5	150		105	E						5		
2213	Elective	BD, CCH	6	180		120	E							6	
M-8. Module "Technology of linear structures"															
2214	Elective	BD, CCH	5	150		105	E						5		
M-9. Module "Rules of technical operation for linear structures"															
2215	Elective	BD, CCH	5	150		105	E						5		
CYCLE OF PROFILE DISCIPLINES (PD)															
M-10. Module of professional activity															
2216	Elective	PD, CCH	5	150		105	E							5	
2217	Elective	PD, CCH	6	180		120	E							6	
2218	Elective	PD, CCH	4	120		75	E						4		
2219	Elective	PD, CCH	5	150		105	E						5		
2220	Elective	PD, CCH	5	150		105	E							5	
2227	Elective	PD, CCH	5	150		105	E							5	
M-11.Module "Design of linear structures"															
2221	Elective	PD, CCH	4	120		75	E						4		
2222	Elective	PD, CCH	6	180		120	E							6	
M-12. Module "Technology of linear structures"															
2223	Elective	PD, CCH	5	150		105	E							5	
2224	Elective	PD, CCH	5	150		105	E								5
M-13. Module "Rules of technical operation for linear structures"															

2225	Elective	PD, CCH	5	150		105	E									5
2226	Elective	PD, CCH	5	150		105	E									5
M-14. Module "Professional practice"																
CIV784	Educational practice	BD, UC	2						2							
CIV785	Production practice I	PD, UC	2								2					
CIV786	Production practice II	PD, UC	3										3			
M-15. Module of final attestation																
ECA003	Preparation and writing of a thesis (project)	FA	6													6
ECA103	Defense of the thesis (project)	FA	6													6
M-16. Module of additional types of training																
AAP500	Military affairs	ATT	0													
	Total based on UNIVERSITY:							31	29	28	32	29	31	33	27	
								60		**60**		**60**		**60**		

Number of credits for the entire period of study					
Cycle code	Cycles of disciplines	Credits			
		required component (RC)	university component (UC)	component of choice (CCH)	Total
GED	Cycle of general education disciplines	51	5		56
BD	Cycle of basic disciplines		41	71	112
PD	Cycle of profile disciplines		5	55	60
	Total for theoretical training:	***51***	***51***	***126***	***228***
FA	final attestation	12			12
	TOTAL:	63	51	126	240

Decision of the Academic Council of Kaznu named after K.Satpayev. Protocol № 13 **от "** 28 **"** 04 **20** 22 **y.**

Decision of the Educational and Methodological Council of Kaznu named after K.Satpayev. Protocol № 7 **от "** 26 **"** 04 **20** 22 **y.**

Decision of the Academic Council of the Institute_____. Protocol № 5 **от "** 28 **"** 04 **20** 22 **y.**

Vice-Rector for Academic Affairs B.A. Zhautikov

Institute Director B.U. Kuspangaliev

Department Head Zh.T. Nashiraliev

Specialty Council representative from employers D.K. Nusupov

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

SATBAYEV UNIVERSITY

APPROVED
Director of the Institute of Architecture and civil engineering named after T. K. Basenov
B.U. Kuspangaliyev
«__» ____ 2022 y.

Elective subjects of Educational Program on enrollment for 2022-2023 academic year

Educational program 6B07118 - "Transport facilities"
Group of educational programs B166 - "Transport facilities"

Form of study: full-time | Duration of study: 4 years | Academic degree: Bachelor of Engineering and Technology

Elective code according to the curriculum	Code of discipline	Name of disciplines	Cycle	Credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in hours	Form of control	Distribution of classroom classes by courses and semesters							
									I course		II course		III course		IV course	
									1 Semester	2 Semester	3 Semester	4 Semester	5 Semester	6 Semester	7 Semester	8 Semester
		CYCLE OF BASIC DISCIPLINES (BD)														
		M-7. Module of basic training														
2201	GEO414	Geodesy with the basics of topography	BD, CCH	5	150	2/1/0	105	Э		5						
	CIV589	Geotechnics in construction				1/0/2										
2202	CIV915	Computer graphics in transport construction	BD, CCH	6	180	1/1/2	120	Э			6					
	CIV916	Design of transport facilities				1/1/2										
	CIV917	Road Landscape Design Architecture				2/0/2										
2203	CIV947	Engineering mechanics 1	BD, CCH	5	150	1/0/2	105	Э			5					
	CIV515	Applied mechanics in transport				1/0/2										
2204	CIV596	Materials Science and Technology of Structural Materials	BD, CCH	5	150	1/1/1	105	Э			5					
	CIV533	Building materials				1/1/1										
2205	CIV822	Economics and management in construction	BD, CCH	5	150	1/0/2	105	Э					5			
	CIV939	Economics and construction management				1/0/2										
2206	ELC186	Electrical engineering	BD, CCH	5	150	1/1/1	105	Э				5				
	ELC101	Electrical and Electronic Engineering				1/1/1										
2208	CIV556	Building Mechanics 2	BD, CCH	5	150	1/0/2	105	Э					5			
	CIV948	Engineering mechanics 2														
2209	CIV945	Technology of building manufacture	BD, CCH	5	150	2/0/1	105	Э					5			
	CIV636	Construction works and processes				1/0/2										
2210	CIV940	Geotechnics I	BD, CCH	4	120	1/1/1	75	Э					4			
	CIV941	Fundamentals of hydrogeology and engineering geology				1/1/1										
2211	CIV515	Bridges and pipes	BD, CCH	5	150	2/1/0	105	Э					5			
	CIV918	Oil and gas pipelines				1/0/2										
	CIV514	Transport systems				2/1/0										
2212	CIV734	Geotechics II	BD, CCH	5	150	1/0/2	105	Э						5		
	CIV637	Geotechnics in foundation engineering				1/0/2										
2213	CIV942	Digital modeling of construction objects BIM	BD, CCH	6	180	1/1/2	120	Э							6	
	CIV925	Computer-aided design in transport construction				1/1/2										
		M-8.Module "Technology of linear structures"														
2214	CIV921	Technology for the construction of bridges, tunnels, and subways	BD, CCH	5	150	1/0/2	105	Э						5		
	CIV922	Oil and gas facilities construction technology				1/0/2										
	CIV527	Modern methods of calculating pavement				1/0/2										
		M-9. Module Rules of technical operation for linearcoopyжений														
2215	CIV639	Ensuring safety in transport construction	BD, CCH	5	150	1/0/2	105	Э						5		
	CIV513	Road traffic safety conditions				1/0/2										
		CYCLE OF PROFILE DISCIPLINES (PD)														
		M-10. Professional activity module														
2216	CIV658	Organization and planning of construction of bridges, tunnels and subways	PD, CCH	5	150	1/0/2	105	Э							5	
	CIV511	Organization and planning of construction of oil and gas facilities				1/0/2										
2217	CIV943	Machinery and equipment for the construction of bridges, tunnels and subways	PD, CCH	6	180	2/0/2	120	Э							6	
	CIV944	Machinery and equipment for the construction of oil and gas facilities				2/0/2										
2218	CIV606	Transport tunnels	PD, CCH	4	120	1/0/2	75	Э						4		
	CIV608	Oil and gas storage				1/0/2										
2219	CIV638	Fundamentals of organization and planning of construction of transport facilities	PD, CCH	5	150	1/0/2	105	Э						5		
	CIV928	Organization of construction				1/0/2										
	CIV548	Organization, planning and management in construction				2/0/1										
2220	CIV643	Subways	PD, CCH	5	150	1/0/2	105	Э							5	
	CIV644	Pumping and compressor stations in oil and gas production				1/0/2										
2227	CIV949	Metrology, standardization and certification of construction products	PD, CCH	5	150	1/1/1	105	E							5	
	CIV950	Metrology, standardization and certification				1/0/2										
		M-11. Module "Design of linear structures"														
2221	CIV929	Design of bridges and pipes	PD, CCH	4	120	1/0/2	75	Э						4		
	CIV930	Design of oil and gas pipeline systems				1/0/2										
2222	CIV931	Design of bridges and tunnel crossings	PD, CCH	6	180	2/0/2	120	Э							6	
	CIV932	Design of oil and gas storage facilities				2/0/2										
		M-12. Module "Technology of linear structures"														
2223	CIV654	Maintenance and repair of bridges and pipes	PD, CCH	5	150	1/0/2	105	Э							5	
	CIV655	Maintenance and repair of oil and gas pipelines				1/0/2										
	CIV662	Maintenance and repair of tunnels and subways				1/0/2										

2224	CIV661	Maintenance and repair of oil and gas storage facilities	PD, CCH	5	150	1/0/2	105	Э										5
	CIV535	Technological support of construction objects				2/0/1												
	M-13. Module "Rules of technical operation for linearcoopyжений"																		
2225	CIV709	Diagnostics of bridges, tunnels and subways	PD, CCH	5	150	1/0/2	105	Э										5
	CIV711	Diagnostics of oil and gas facilities				1/0/2												
2226	CIV935	Rules for the technical operation of transport facilities	PD, CCH	5	150	1/0/2	105	Э										5
	CIV936	Technical regulations of transport infrastructure				1/0/2												
M-17. Module "R&D"																			
2211	CIV748	The main provisions of scientific work	BD, CCH	5	150	2/0/1	105	П						5					
2219	CIV749	Research activity in transport construction 1	PD, CCH	5	150	0/0/3	105	П							5				
2223	CIV750	Research activity in transport construction 2	PD, CCH	5	150	0/0/3	105	П								5			
2225	CIV751	Patenting in transport construction	PD, CCH	5	150	1/0/2	105	П											5
	Total by UNIVERSITY:								0	5	16	5	29	33	43	20			
									5		21		62		63				

Number of credits in elective subjects for the entire period of study		
Cycle	Cycles of disciplines	Credits
BD	Cycle of basic disciplines	71
PD	Cycle of profile disciplines	75
	ИТОГО:	146

Decision of the Academic Council of the Institute of A and C. Protocol № 5 от "28" 01 2022 y.

Department Head Zh.T. Nashiraliyev

Specialty Council representative from employers Zh.K. Nusupov

Descriptors and level of knowledge, skills and competences

A - Knowledge and understanding of:

A1 -bases of architectural design, modern types of constructionstions of buildings and structures;

A2 -Basic physical and mechanical properties of building materials and their manufacturing technology, methods to improve the efficiency of consumptionNia;

A3- methods of engineering surveys in construction;

A4 - basic concepts, laws and methods of engineering mechanics;

A5 - fundamentals of calculation and design of buildings and structures, engineering systems, the selection of the composition of building materials, products and structures;

A6 - technology, organization, mechanization and automation of building production;

A7 - the basis of economic theory, economics, industry, management and marketing, accounting and auditing.

B - Application of knowledge and understanding:

B1 -self-development and launching of various ways to solve professional problems with the use of theoretical and practical knowledge;

B2 -the use of normative and legal documents relating to the professional activity;

B3 -perform calculations of buildings and structures, their bases and foundations, engineering systems, including the use of modern software products;

AT 4 - develop design solutions that meet the requirements of long-term development of the industry, using modern software products;

B5 - analyze production and economic activities of the division and / or the entire enterprise, including using ency-software variables;

AT 6 - to evaluate and monitor the quality of construction and installation work, as well as to carry out acceptance and executed works.

C - Formation of judgment:

C1 -the nature and social significance of their future profession, value disciplines that define a particular area of its activities, its relationship in a holistic system of knowledge;

C2 -of scientific, philosophical and religious paintings of the universe; variety of forms of human knowledge; spiritual values in a creative and everyday life;

C3- about trends in technology of erection of buildings and constructions, production of building materials technology;

D - personal abilities

D1 -the ability to self-organization and self-education;

D2 - the ability to adapt to new situations, the revaluation of accumulated experience, the analysis of its features;

D3 -command of the state language and the language of international communication; lexical and grammatical at least one foreign language;

Competence on completion of training

B - Basic knowledge and skills:

B1 - have a basic knowledge in the field of natural sciences (social, humanitarian, economic) disciplines that contribute to the formation of a highly educated person with a broad outlook and culture of thinking;

B2 - have skills of handling modern technology, be able to use information technologies in the sphere of professional activity;

B3 - be able to analyze and understand the philosophical issues with scientific positions, independently develop cultural wealth, logically and convincingly right to think and to properly build oral and written language;
B4 - be able to express and justify their position on the choice of methods for solving tasks.

P - professional competence, including in accordance with the requirements of the industry professional standards:
P1 - a wide range of theoretical and practical knowledge in the professional field;
P2 - knowledge of modern calculation complex for calculation and design of construction projects in view of earthquake resistance and complex hydrogeological conditions.
P3 - knowledge of modern methods and techniques of construction works using construction equipment in the construction of buildings and structures.

About - human, social and ethical competence:
O1 - to know the social and ethical values based on public opinion, traditions, customs, social norms and navigate to them in their professional activities;
O2 - know the basics of the legal system and the legislation of Kazakhstan; abide by business ethics, own ethical and legal standards of conduct;
O3 - to be able to work in a team, properly to defend his point of view, to offer new solutions; be able to find compromises, to relate their views to the collective opinion: to strive for professional and personal growth;
O4 - to know the trends of social development; to be able to properly navigate the different social situations.

C - Special and managerial competence:
C1-independent management and control of the processes of labor and training activities within the strategies, policies and objectives of the organization, discussion of problems, argumentation conclusions and competent handling of information;
C2 - knowledge of methods of calculation of structures and apply to address specific tasks; the ability to make judgments, evaluation of ideas and formulation of conclusions on specific professional issues;
C3 - the ability to correct choice of design methods of building production and application in practice.

Policy additional education Minor

During the development of at least 12 credits in the disciplines of the program, including the following compulsory subjects (if any):
M1 -
M2 -
M3 -
Assigned additional Minor specialty with the issuance of the Diploma Supplement of the established sample.

Annex to the diploma for standard ECTS

Bachelor of Engineering and Technology, 6 level national qualifications framework with the right management staff to take responsibility for the result at the unit level.

Mathematics 1
CODE – MAT101
CREDIT - 5 (1/0/2)
Prerequisite - Elementary mathematics-school course / diagnostic test

GOAL AND OBJECTIVES OF THE COURSE

The main objective of the course is to give the future a certain amount of specialist knowledge on sections of the course "Mathematics-I», required for the related engineering disciplines. Introduce students to the ideas and concepts of mathematical analysis. The main attention is given to the development basic knowledge and skills with a high degree of understanding of the differential and integral calculus.

Objectives of the course:

Acquisition of knowledge necessary for effective use of rapidly developing mathematical methods; obtaining building skills and research of mathematical models; possession of the fundamental parts of mathematics needed to solve research and practical problems in the professional field.

BRIEF DESCRIPTION OF THE COURSE

Current "Mathematics-I» given exposure sections: the introduction into the analysis, differential and integral calculus

KNOWLEDGE, SKILLS, SKILLS TO COMPLETE THE COURSE

Study ofsaid discipline will enable students to apply course "Mathematics-I» to solve simple practical problems, to find the tools that are sufficient for their studies and obtain numerical results in some standard situations.

Mathematics 2
CODE – MAT102
CREDIT - 5 (1/0/2)
Prerequisite - Mathematics I

GOAL AND OBJECTIVES OF THE COURSE

The objective 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.

Objectives of the course is to instill students with solid skills in solving mathematical problems with bringing solutions to a practically acceptable result. Develop primary skills of mathematical research applied issues and the ability to independently understand the mathematical apparatus contained in the literature associated with the student's specialty.

BRIEF DESCRIPTION OF THE COURSE

Current "Mathematics-II» given accessible presentation sections: Elements of linear algebra and analytic geometry, differential calculus functions of many variables, multiple integrals. "Mathematics II» is a logical continuation of the course "Mathematics I».

Knowledge, skills, skills to complete the course

Study of said discipline will enable use the acquired theoretical knowledge and skills with a high degree of understanding of their sections of the course, to use them at an appropriate level; translate into mathematical terms simple problems posed in terms of other subject areas; acquire new mathematical knowledge through educational and information technology; solve applied problems in the sphere of professional activity.

Architectural physics

CODE – PHYS468
CREDIT - 5 (1/1/1)
Prerequisite - a diagnostic test 1

GOAL AND OBJECTIVES OF THE COURSE

The main objective of teaching the PhysicsI and Physics II It is to build notions of modern physical picture of the world and the scientific worldview.

BRIEF DESCRIPTION OF THE COURSE

discipline Physics are the basis of theoretical training and engineering activity of graduates of the higher technical school and represent the core of the physical knowledge needed an engineer to the current laws of the physical world. The course "Physics 1" includes the following sections: physical foundations of mechanics, structure of matter and thermodynamics, electrostatics andelectrodynamics. Discipline "Physics II"It is a logical continuation of the discipline" Physics 1 ", and generates a holistic view of the course of general physics as one of the basic components of the generaltheoretical training bachelors of engineering profile. Discipline "Physics II» includes the following sections: magnetism, optika, nanostructures, basics of quantum physics, atomic and nuclear physics.

KNOWLEDGE, SKILLS, SKILLS TO COMPLETE THE COURSE

- the ability to use the knowledge of the fundamental laws, theories of classical and modern physics, as well as the use of physical research as the basis for a system of professional activity.

Architectural physics

CODE – PHY466
CREDIT - 5 (1/0/2)
Prerequisite - PHY111

GOAL AND OBJECTIVES OF THE COURSE
The main goal of teaching the course is to form ideas about architectural physics
BRIEF DESCRIPTION OF THE COURSE
The purpose of the discipline is to form students' knowledge and ability to use the calculation methodology on practical examples, as well as the skills of conducting physical research in the field of architectural and construction design, as the basis for future professional activities. Studying sections: building physics, architectural physics, acoustics
KNOWLEDGE, SKILLS, SKILLS TO COMPLETE THE COURSE
- the ability to use the knowledge of the fundamental laws, theories of classical and modern physics, as well as the use of physical research as the basis for a system of professional activity.

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 introduce engineering students to the basic theoretical and practical achievements of Soviet historical scholarship on the history of modern Kazakhstan, by the complex and systematic study of the basic stages of formation and development of Kazakhstan's society.

- analyze the peculiarities and contradictions of the history of Kazakhstan in the Soviet period;
- to reveal the contents of the historical foundations of political laws, socio-economic and cultural processes in the stages of formation of an independent state;
- promote the formation of a civic stand of students;
- to educate students in the spirit of patriotism and tolerance, of belonging to his people, the Fatherland;

BRIEF DESCRIPTION OF THE COURSE

The course of 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 XX century, during the creation of the Kazakh SSR, as well as the process of establishing a multi-ethnic society.

Knowledge, skills, skills to complete the course

- knowledge of the events, facts and phenomena of the contemporary history of Kazakhstan;
- knowledge of the history of the ethnic groups living in Kazakhstan;
- knowledge of the basic stages of formation of Kazakh statehood;
- ability to analyze complex historical events and to predict their further development;
- ability to work with all kinds of historical sources;
- ability to write essays and research papers on the history of the Fatherland;
- the ability to handle historical concepts;
- the ability to lead the discussion;
- skills of independent analysis of the historical facts, events and phenomena;
- the skills of public speaking.

Kazakh / Russian language
CODE - LNG104
CREDIT - 10 (0/0/6)
Prerequisite - a diagnostic test

GOAL AND OBJECTIVES OF THE COURSE

- to teach students to have hearing statements on familiar topics related to home, school, leisure centers;
- understand texts in personal and professional topics, containing the most frequent words and expressions;
- be able to carry on a conversation on everyday topics; describe their experiences; tell your opinion; recount and evaluate the content of reading the book, seen the movie;
- be able to create simple texts on familiar topics, including those related to professional activities.

BRIEF DESCRIPTION OF THE COURSE

Language course material is selected in such a way that the student, learning lexical and grammar at least had the opportunity to get acquainted with the typical communication situations, and he found himself in such situations, able to correctly evaluate them and select the appropriate model (strategy) of verbal behavior.

The main focus of training at the same time is transferred from the transfer of knowledge on learning to use the language being studied in the implementation of different types of speech activity, which is the reading of (subject to reading comprehension), listening (with the same proviso) and the production of a certain complexity of the text with a certain degree of grammatical and lexical correctness.

The material selected for the training so that students studying Kazakh / Russian language, acquired skills in reading, writing and understanding of oral speech on the basis of the simultaneous development of the basics of grammar (fonetikai, morphology and syntax) and the use of words in the continuous multiple repetition with the increasing complexity of buildings.

Knowledge, skills, skills to complete the course

The student with the active organization of work in the classroom and good homework by the end of the first semester, acquires skills, appropriate European level A2 (Threshold of ALTE classification), that is, is on the verge of self-level proficiency.

English
CODE - LNG108
CREDIT - 10 (0/0/6)
Prerequisite - a diagnostic test

LNG1081
GOAL AND OBJECTIVES OF THE COURSE

Discipline in the English language "Beginner English" is designed primarily for learning from scratch. This course is suitable also for those who have only a general basic knowledge of the language. After passing this level, the student will be able to confidently communicate in basic topics in English, learn the basics of grammar and lay a certain foundation that will improve their skills to the next stage of learning English.
Postrekvizity Course: Elementary English.

LNG1082
GOAL AND OBJECTIVES OF THE COURSE

Discipline "Elementary English" - is the foundation of learning English, which focuses on the development of receptive students skills (reading and listening) and productive skills (writing and speaking), the analysis of the basic knowledge, use and storage of the main rules of grammar and mastering the features of pronunciation and basic vocabulary as well as promoting independent learning and critical thinking.
Prerequisite courses: Beginner.
Postrekvizity course: General 1.

LNG1083
GOAL AND OBJECTIVES OF THE COURSE

The aim of the course "General English 1" - to provide students with the opportunity to obtain sufficient knowledge to become more fluent in everyday social and academic settings. Students work on improving pronunciation, vocabulary and grammar. At this level, the main challenge will be to reinforce the skills obtained earlier, to learn how to prepare and properly apply complex syntactic structures in English, as well as to achieve a really good pronunciation.
Prerequisites Course: Elementary English.
Postrekvizity course: General 2.

LNG1084
GOAL AND OBJECTIVES OF THE COURSE

The course "General English 2" is designed for students who continue to study the "General English 1". The course is focused on the ability to actively use in practice most aspects of the English language, conditional sentences, phrases in the passive voice, etc. At this stage, the student will be able to maintain a conversation with several people or to express their views. Student greatly expands their vocabulary, allowing it to freely express their thoughts in any situation. At the same time it filled up with various synonyms and antonyms of familiar words, phrasal verbs and fixed expressions.
Prerequisites course: General 1.
Postrekvizity course: Academic English.
LNG1085
GOAL AND OBJECTIVES OF THE COURSE

The main objective of the course of English "Academic English" is to develop the academic language skills. Discipline is a language style that is used when writing academic papers (paragraph

abstract, essay, presentation, etc.). This course is designed to help students become more successful and effective in their teaching, developing critical thinking skills and independent learning.
Prerequisites course: General 2.
Postrekvizity course: Professional English.

LNG1086
GOAL AND OBJECTIVES OF THE COURSE

"Business English" (Business English) - it is English for business communication, business and career. Knowledge of business English is useful for negotiations and business correspondence, preparation of presentations and informal communication with business partners.
preparation features are that it is necessary not only to master the vocabulary, but also to learn new skills: presentation, communication, language, professional.
Prerequisites course: IELTS score 5.0, and / or Academic English
Postrekvizity course: Professional English, IELTS score 5.5-6.0

LNG1087
GOAL AND OBJECTIVES OF THE COURSE

"Professional English" course is designed for students of level B2 +, which aims - to increase the language competence of students in their respective professional fields. The main objective of the course is to teach students to work with texts, both audio and written, in the specialty. The curriculum is based on the necessary vocabulary (words and terms), often used in the English language for specific purposes. Students acquire professional English language skills through integrated education on the basis of content and language, possess the vocabulary to read and understand the original sources with a high degree of independence, and to practice different communication patterns and vocabulary in specific professional situations.
Prerequisites course: Business English.
Postrekvizity course: any elective course.

Fundamentals of Entrepreneurship, Leadership and Anti-Corruption Culture
CODE - MNG487
CREDIT - 3 (1/0/1)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE

To form systemic knowledge about the basics of organizing business activities. Develop organizational and managerial skills in doing business. To form knowledge about the responsibility of business entities, the student must learn aesthetic concepts and categories, the content and features of professional ethics in legal activity, possible ways (methods) of resolving moral conflict situations in the professional activities of a lawyer, the essence of professional and moral deformation and ways to prevent and overcome it, features of the lawyer's etiquette, its basic norms and functions; be able to evaluate the facts and phenomena of professional activity from an ethical point of view, apply moral rules and norms of behavior in specific life situations

BRIEF DESCRIPTION OF THE COURSE

The discipline is aimed at forming in students the organizational and legal form of the enterprise based on the goals of the enterprise and the characteristics of the organization and functioning of enterprises in various forms; evaluate the effectiveness of entrepreneurial activity; assess external and internal risks for the enterprise; 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 managerial problems. Diagnose organizational culture, identify its strengths and weaknesses, develop proposals for its improvement. Develop activities to motivate and stimulate the staff of the organization.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

Know: typology of entrepreneurship; the role of the environment in the development of entrepreneurship; business decision-making technology; basic components of the internal environment of the company; organizational and legal forms of entrepreneurial activity; features of constituent documents; procedure for state registration and licensing of an enterprise; mechanisms of functioning of the enterprise; the essence of entrepreneurial risk and the main ways to reduce risk; main

elements of business culture and corporate culture; list of information to be protected; essence and types of responsibility of entrepreneurs; methods and tools of financial analysis; the main provisions of accounting for small businesses; types of taxes; a system of business performance indicators; principles and methods for evaluating the effectiveness of entrepreneurial activity; ways to improve and control the efficiency of entrepreneurial activity.

Be able to: characterize the types of entrepreneurial activity and the business environment; operate in practical activities with economic categories; develop a business plan; draw up a package of documents for starting your own business; draw up documents for opening a bank account; determine the organizational and legal form of the enterprise; develop the strategy and tactics of the enterprise; observe professional ethics, ethical codes of the company, generally accepted rules for doing business;

Skills for students to master the scientific and legislative foundations for organizing and doing business in the Republic of Kazakhstan; study of the features, problems and prospects of its development in Kazakhstan.

Philosophy
CODE - 128
CREDIT - 2 (1/0/0)
Prerequisite - no

GOAL AND OBJECTIVES OF THE COURSE

The course is focused cognitive, operational, communication, self-educational competence to solve problems:

- contribute to the development of adequate philosophical orientation in the contemporary world;
- to form a creative and critical thinking in students;
- to distinguish between the ratio of the spiritual and material values, their role in human life, society and civilization;
- assist in determining their attitude to life and the search for harmony with the environment.

BRIEF DESCRIPTION OF THE COURSE

"Philosophy" is the formation of a holistic world view that has developed in the context of the socio-historical and cultural development of mankind. Familiarity with the basic paradigms of the methodology of teaching philosophy and education in classical and post-classical traditions of philosophy. Philosophy aims to develop a sustainable life guidance, finding the meaning of their existence as a special form of spiritual production. It promotes the formation of moral character of the person with the ability of critical and creative thinking. Theoretical sources of this course is the concept of Western, Russian, Kazakh scientists on the history and theory of philosophy.

Knowledge, skills, skills to complete the course

- knowledge of basic terms, the main concepts and problems of philosophy;
- knowledge of basic philosophical ways of solving philosophical problems in the context of culture;
- the ability to analyze the history of philosophical thought;
- ability to identify alternative ways of formulating and solving philosophical problems in the history of mankind;
- the ability to identify the main theoretical approaches to the relationship between man and society;
- the ability to master techniques for performing independent work;
- search skills systematization of the material;
- skills to freely discuss and make rational decisions;
- skills ethical principles in professional activities.

Culturology
CODE - HUM129
CREDIT - 2 (1/0/0)
Prerequisite

PURPOSE AND OBJECTIVES OF THE COURSE

Course objective:

to form in undergraduate students an understanding of the specifics of the development of national culture in the context of world culture and civilization, the need to preserve the cultural code of the Kazakh people, the ability in independent professional

activities to pursue a strategy for preserving the cultural heritage of the Kazakh people in a dynamically changing multicultural world and society.

Course objectives:

- describe the morphology and anatomy of culture as a system of parameters and forms in 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 streamline information about the cultural heritage of the inhabitants of Kazakhstan and determine the channels of their influence on the formation of the culture of the Kazakh people;
- classify the cultural capital of the Turks, streamline the forms and channels of cultural interaction with the peoples of Western Europe, the Middle East, identify their contribution to the intellectual and cultural history of mankind and the Kazakh people;
- reasonably and reasonably present information about the various stages of the development of Kazakh culture as a factor in the preservation of cultural heritage;
- to give an objective assessment of the national cultural heritage from the standpoint of maintaining the status of Kazakh culture, the Kazakh language and their role in the formation of cultural and national identity;

BRIEF DESCRIPTION OF THE COURSE

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

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As part of the course, the student will master the practical use of cultural studies methods in various aspects of life.

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

At the end of the course the student should know:

- information about the cultural heritage of the inhabitants of Kazakhstan and determine the channels of their influence on the formation of the culture of the Kazakh people;
- classification of the cultural capital of the Turks, to streamline the forms and channels of cultural interaction with the peoples of Western Europe, the Middle East, to identify their contribution to the intellectual and cultural history of mankind and the Kazakh people;
- reasonably and reasonably provide 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.

Sociology
CODE - HUM127
CREDIT - 2 (1/0/0)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the course: the formation of theoretical knowledge about society as an integral system, its structural elements, connections and relationships between them, the features of their functioning and development, as well as existing sociological theories that explain social phenomena and processes.

The tasks of mastering the discipline:

- the study of the basic values of social culture and the willingness to rely on them in their personal, professional and general cultural development;
- study and understanding of the laws of development of society and the ability to operate with this knowledge in professional activities;
- the ability to analyze socially significant problems and processes, etc.

BRIEF DESCRIPTION OF THE COURSE

The discipline is designed to improve the quality of both general humanitarian and professional training of students. Knowledge in the field of sociology

are the key to effective professional activity of the future specialist, which is impossible in the conditions of modern society without

understanding of social processes, as well as without mastering the skills of their correct interpretation.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

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

know:

• features of the sociological approach to the interpretation of the basic concepts and terms of the social sciences;

• main classical sociological theories and schools;

• key concepts of sociology: society, group, socialization, social facts and social actions, norms, values, social structure, mobility, culture, social institution, social organization, social process, etc.;

• basic approaches to the identification and analysis of 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 the features of their application;

be able to:

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

• explain the differences in approaches to the definition of sociological concepts;

• consider social phenomena, institutions and processes from different points of view, argue their own position on the problem, comparing and comparing some theoretical perspectives;

• find, analyze and present factual data, analytical information about social groups, institutions, processes and phenomena, revealing abstract concepts using examples using various kinds of data;

own:

• the ability to use sociological knowledge in practice to analyze the phenomena and events of social reality;

• skills of independent individual preparation, constructive communication and performance of appropriate roles in the implementation of group projects, participation in discussions;

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

• Skills of academic and grammatically correct writing, text structuring, source processing, reference apparatus design.

Psychology
CODE - HUM1222
CREDIT - 2 (1/0/0)
Prerequisite

PURPOSE AND OBJECTIVES OF THE COURSE

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

The tasks of mastering the discipline:

1) mastering the 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, the psychological patterns of the age and cultural socialization of a person, the factors of his learning and cognitive development;

3) instilling the skills to use the knowledge gained in the process of assimilation of psychology in professional activities.

4) to develop the skills of analytical and research thinking, creative development of the content of psychological sources of foreign and domestic authors and methods for 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" considers the laws of the emergence, development and functioning of mental processes, states, properties of a person engaged in a particular activity, the laws 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, SKILLS AFTER COMPLETING 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 the manifestation;

- general psychological patterns of development of psychological phenomena;
- knowledge of the psychological patterns of communication and interaction between people;
- the dynamics of development and the 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 relations in a group, the characteristics of the activities of various individuals;
- apply psychological knowledge as a means of self-knowledge and self-development;
- design effective methods of work in various areas of social communication based on the content of psychological theories and ideas;

own:

- argumentation skills focused on achieving high results of educational and professional activities.
- the ability to work in a team, correctly defend one's point of view, offer 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 modern conditions of the development of society.

Life safety
CODE - CHE451
CREDIT - 2 (1/0/0)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the discipline: to study the impact of anthropogenic hazards and risks in the context of new realities that disrupt the normal life of people, causing accidents, leading to emergencies and disasters, including environmental ones. To instill the skills to identify these hazards and learn the measures to prevent or the principles of protection against them.

BRIEF DESCRIPTION OF THE COURSE

Life safety deals 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 for its activities; the consequences of human exposure to traumatic, harmful and damaging factors; means and methods for improving the safety, environmental friendliness and sustainability of technical means and technological processes.

EXPECTED RESULTS UPON THE COMPLETION 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 means of protection 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 population.

Ecology and sustainable development
CODE - CHE452
CREDIT - 2 (1/0/0)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE

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

Course objectives:

- to understand the causes of the origin and development of environmental problems of our time;
- to master a system-integrated approach to solving environmental problems of our time;
- 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 single 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 enormous and ever-increasing impact human activity on the biosphere has reached a level where human activity has 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, SKILLS, AFTER COMPLETION OF THE COURSE TO KNOW:

- Assessment of the state of the natural environment under global changes;
- the main stages in the development of civilization and the ecological 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:
- to analyze ecological processes and phenomena;

- to form an ecological outlook based on the use of the provisions of the concept of sustainable development.

HAVE 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 achievement of sustainable development in the context of global changes.

Information and communication technologies (in English)
CODE - CSE677
CREDIT - 5 (2/1/0)
Prerequisite - no

GOAL AND OBJECTIVES OF THE COURSE

Training in the use of modern information technologies in the field by professional activities. The objectives of the course include:

- Expand the basic concepts of the architecture of computer systems;
- Expand the basic concepts of information and communication technologies and the subject terminology;
- Learn to work with the software interfaces of operating systems;
- learn to work with the data in a different view, as a table structured and unstructured;
- learn how to apply the basic principles of information security;
- Expand the concept of data formats and multimedia content. Learn to work with standard media processing applications data. Use modern approaches presentation material;
- Expand the concept of modern social, cloud and e-mail platforms and ways to work with them;
- Train the use of algorithms and programming techniques to solve business process automation tasks.

BRIEF DESCRIPTION OF THE COURSE

The course includes a training program aimed at leveling the basic knowledge of students in the field of information and communication technologies. It contains full-time, according to the model curriculum SES, with a predominance of training of practical skills of working with data, algorithms and programming. The course is structured in such a way that would teach students not only basic concepts of architecture and modern infrastructure of information and communication technologies, but also to learn to use these tools to solve applied problems. Learn how to optimize processes, to apply adequate models and methods for solving practical problems with the use of modern methods and information technology tools to automate routine processes to be more productive and efficient.

Knowledge, skills, skills to complete the course
As a result of studying the discipline the student should know:

- Software Packages;
- The architecture of computer systems;
- the infrastructure of information and communication technologies;
- The interfaces of modern operating systems;
- Advanced tools for working with data of different nature and purpose;
- Types of information security threats, principles, tools and methods for data protection;
- Python programming language.

be able to:

- Work with interfaces of modern operating systems;
- To work with modern software application for data of different nature and purpose;
- Apply contemporary social, cloud, email platform for the organization of business processes;
- Programming on algorithmic programming language;
- To analyze, simulate, design, implement, test and evaluate the system of information and communication technologies.

Philosophy
CODE - HUM132
CREDIT – 5 (1/0/2)
Prerequisite - no

PURPOSE 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 between the ratio of spiritual and material values, their role in the life of a person, society and civilization;
- contribute to the definition of one's attitude to life and the search for harmony with the outside world.

BRIEF DESCRIPTION OF THE COURSE
"Philosophy" is the formation of a holistic worldview that has 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 postclassical traditions of philosophy. Philosophy is called upon to develop sustainable life guidelines, finding the meaning of one's being as a special form of spiritual production. Contributes to the formation of the moral character of the individual with the ability of critical and creative thinking. The theoretical sources of this course are the concepts of Western, Russian, Kazakh scientists on the history and theory of philosophy.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
- knowledge of basic terms, main concepts and problems of philosophy;
- knowledge of the main philosophical ways 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 solving worldview issues in the history of human development;
- the ability to identify the main theoretical approaches in the relationship of man with society;
- ability to master the methodology of independent work;
- skills of searching for systematization of material;
- Skills to freely discuss and make rational decisions;
- skills of ethical principles in professional activity.

Engineering and computer graphics

CODE - GEN177

CREDIT - 5 (1/1/1)

Prerequisite - no

GOAL AND OBJECTIVES OF THE COURSE

- the development of spatial representation and imagination, constructive-geometric thinking, capacity for analysis and synthesis of spatial forms and relations on the basis of graphic space models;
- training students to work with different in appearance and content of the image information, based on the graphic representation of information, methods of graphic modeling of geometric objects, the rules of design and construction documentation design, graphic models of phenomena and processes;
- development of methods and means of computer graphics students acquire knowledge and skills to work with a system of computer-aided design AutoCAD.

BRIEF DESCRIPTION OF THE COURSE

Studying ways to get certain graphic models of space, based on the orthogonal projection and the ability to solve the problem on these models, related forms and spatial relationships. Mastering the basic principles and methods of geometric modeling and methodologies for the development of graphical applications. Acquisition of knowledge of construction drawing, the ability to read and compose graphical and textual design documentation in accordance with the requirements of normative documents, state standards. Introducing students to the concept of computer graphics, geometric modeling, graphics, modern interactive graphic systems for automation tasks of drawing and graphic works on AutoCAD example.

Formation of skills in the use of universal graphic systems for the development and editing of drawings by using three-dimensional computer simulation, design automation for the development and implementation of the design documentation.

Knowledge, skills, skills to complete the course

As a result of studying the discipline the student should know:

- theoretical fundamentals of complex and axonometric drawings;
- methods of imaging - species profiles, cross sections - both existing and newly developed products;
- rules for the implementation and design drawings, preparation of design and text documents, set of guests;
- types of compounds parts products, their conditional images and symbols;
- methods for constructing sweep surfaces.

be able to:

- to build complex and axonometric drawing of geometric forms;
- perform text and graphic design documentation;
- read and execute an assembly drawing working drawings and sketches in accordance with the GOST;
- to freely navigate in projections with numerical marks;
- to work in the AutoCAD environment as a universal species with 2M, 3M and with objects.

have the skills to:

- performing and reading assembly drawing;
- building a three-dimensional space of flat projection models;
- solving positional and metric problems;
- possession of modern means of computer-aided design.

possess the following competencies:

- ability to apply the methods of graphical representation of objects of professional activity, for example, engineering objects, circuits and systems;
- willingness to use information technologies, including modern means of computer graphics in their subject area;
- willingness to participate in the development of design and working design documentation in accordance with the standards, technical conditions and other normative documents.

Technology of road building materials
CODE - CIV508
CREDIT - 5 (1/1/1)
Prerequisite - Physics I, II, Chemistry

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of teaching the discipline "Technology of road construction materials", as one of the first engineering disciplines, is to train a specialist who knows well the basics of materials science for obtaining building materials with the required properties; issues of durability of materials; their role in ensuring high operational quality, environmental friendliness, economy and aesthetics.
The main objective of studying this discipline is to understand the leading position of the industry in the production of the most important building materials and products in road construction: the rational use of raw materials, taking into account environmental safety, saving fuel and energy and other material resources in the production of building materials and products that correspond to their purpose. .

BRIEF DESCRIPTION OF THE COURSE
"Technology of road building materials" is one of the main disciplines for transport construction specialists. All transport structures are built from building materials, so their correct choice, the ability to assess their quality and degree of safety, as well as to ensure normal operating conditions for structures made of these materials - all this is necessary for students of our specialty to know.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student should know:
- nomenclature of building materials and their properties;
- features of their structure, raw materials;
- the essence of the operation and processes of processing raw materials;
- production technology of various building materials, their cost, etc.
be able to:
- competently determine the features of building materials;
- justify the choice of materials and products in design solutions for the given conditions of their operation;
- ensure the quality of materials;
- predict the reliability and durability of materials in structures;

- determine the economic efficiency of production and use of building materials and products;
- control production;
- evaluate the properties of building materials and products with numerical indicators and be well versed in the methodological principles of their determination. own:
- materials science bases for obtaining building materials with the required properties.

Geodesy in construction
CODE - CIV589
CREDIT - 5 (1/0/2)
Prerequisite - Physics I, Higher Mathematics

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of studying this discipline is to obtain theoretical knowledge and practical skills in a set of geodetic works performed during surveys, design, construction and operation of a mining enterprise

BRIEF DESCRIPTION OF THE COURSE
The discipline "Geodesy in construction" is an obligatory component of the cycle of basic disciplines. Knowledge of the basic concepts and definitions of the course is necessary for the study of subsequent disciplines, the discipline plays an important role and importance in the training of specialists.

OBJECTIVES OF THE DISCIPLINE
The tasks of the discipline are as follows: to correctly solve geodetic problems in the process of designing, surveying, building and operating a mining enterprise.
As a result of studying this discipline, students should:
have an idea: about the shape and size of the Earth and its individual parts of the surface, about the ways of depicting them on the map, about the close connection of geodesy with all technological processes of a mining enterprise;
know: the device of the main geodetic instruments, the methodology for performing angular, linear and height measurements on the earth's surface, the rules for cameral processing of geodetic measurements, the basic requirements for compiling topographic documentation;
be able to: use topographic and geodetic material in solving practical problems of mining, as well as perform the simplest geodetic measurements and stakeouts during the operation of mineral deposits;
acquire practical skills: in working with geodetic instruments, performing angular, linear and height measurements on the ground, performing basic geodetic surveys, performing computational and graphic work when processing the results of geodetic measurements and solving engineering problems according to plans and maps.

Structural mechanics
CODE - CIV584
CREDIT 5 (1/0/2)
Prerequisite - Physics I, II. Mathematics I, II.

PURPOSE AND OBJECTIVES OF THE COURSE
Obtaining theoretical knowledge by students about the forces and conditions of equilibrium of material bodies under the action of forces, the study of the deformation of elastic bodies under the action of external forces and elementary calculations for the strength, rigidity and stability of structural elements.

BRIEF DESCRIPTION OF THE COURSE
Structural mechanics is a complex discipline that currently covers such disciplines as theoretical mechanics, resistance of materials and structural mechanics, consisting of sections "Theoretical mechanics" and "Strength of materials" is included in the list of the cycle of basic disciplines (BD), the mastery of which determines the qualification and academic bachelor's degree in construction. The section "Theoretical Mechanics" considers the main provisions of statics. The section "Resistance of materials" considers calculations for the strength and stiffness of statically determinable systems in tension, compression, geometric characteristics, shear, bending of straight rods, stability of structural elements. The task of studying the discipline is the application of theoretical knowledge to solve practical problems that arise in the design of structural elements and structures.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, the student should know:
- basic provisions of statics;
- basic methods and principles for calculating structural elements for strength and stiffness, as well as recommendations for the rational design of engineering structures.
be able to:
- knowing the basic principles of statics and the equilibrium conditions obtained for absolutely rigid bodies, apply them both to small deformable and any changeable bodies;
- carry out calculations for the strength, rigidity and stability of elements in structures for the simplest types of deformations (tension - compression of statically determinate systems, shear, bending).
have skills:

- solving applied problems: - performing three types of strength calculations; - verification determination of the design load, design; - on carrying out calculations for rigidity.

Computer graphics in construction drawing
CODE - CIV585
CREDIT - 5 (1/2/0)
Prerequisite - Mathematics I, Engineering Graphics

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of teaching the discipline "Computer graphics in construction drawing" is to master the students of modern methods and means of computer graphics; acquisition of knowledge and skills in building two-dimensional geometric models of objects using a graphic system.

The tasks of mastering the discipline

The student, in accordance with the types of professional activity, must solve the following professional tasks:

In the field of research and design activities:

- collection and systematization of information and initial data for the design of buildings, structures, engineering systems and equipment, planning and development of populated areas;
-calculation and design of parts and assemblies using standard design automation tools;
- preparation of design and working technical documentation, registration of completed design works;
- ensuring compliance of developed projects and technical documentation with the task, standards, norms and rules, specifications and other executive documents.

In the field of production-technological and production-management activities:

- organization of workplaces, their technical equipment, placement of technological equipment;
- control over the observance of technological discipline;
- maintenance of technological equipment and machines;
- organization of metrological support of technological processes, use of standard methods for quality control of construction, manufactured products, machinery and equipment;
- participation in work on fine-tuning and development of technological processes in the course of construction preparation, production of building materials, products and structures, manufacture of machinery and equipment;
- implementation of environmental safety measures;
- organizing the work of small teams of performers, planning the work of personnel and payroll funds;
- preparation of technical documentation (work schedules, instructions, plans, estimates, applications for materials, equipment), as well as established reporting according to approved forms;
- performance of works on standardization and preparation for certification of technical means, systems, processes, equipment and materials;
- execution of documentation of the quality management system of the enterprise
- development of operational plans for the work of the primary production unit;
- analysis of costs and results of the production unit.

BRIEF DESCRIPTION OF THE COURSE

Basic principles of computer-aided design systems. Graphic primitives and their modification. Working with text, blocks, layers. Three-dimensional surfaces and bodies. Fundamentals of drawing drawings in the AutoCAD system. Building perspective and shadows in perspective using the AutoCAD system. Building shadows in orthogonal and axonometric projections in the AutoCAD system. Projections with numerical marks, construction of excavation boundaries in the AutoCAD system. Construction of axonometric projections by various methods ("extrusion", "rotation") in the AutoCAD system.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of mastering the discipline, the student should know:
- hardware and software tools for the implementation of information technology
- global and local computer networks;
- design documentation, assembly drawing, geometry elements

details, axonometric projections of details, images and designations of details, basics of computer modeling.
be able to:
- apply computer technology to solve practical problems;
- use the capabilities of computer technology and software;
- build axonometric projections, make sketches using computer technology, read assembly drawings and draw up design documentation.
own:
- the main methods of working on a personal electronic computer (PC) with application software; - computer programs for the design and development of drawings.

Metrology, standardization and certification of construction products
CODE - CIV533
CREDIT – 5 (1/1/1)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE
The formation of knowledge and skills in the field of calculation and design is aimed at meeting the needs of society for qualified personnel in the field of standardization, metrology, technical regulation capable of solving complex problems in the field of construction and related sectors of the economy;
- training of bachelors with relevant professional skills and competencies that contribute to the solution of theoretical, practical aspects of quality management and increasing the competitiveness of products

BRIEF DESCRIPTION OF THE COURSE
This educational program will produce specialists with knowledge in the field of standardization, conformity assessment, accreditation, quality systems, metrology.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
- Possession of organizational, scientific, methodological foundations for organizing work in the field of standardization, certification, metrology, systems and quality management of products, processes and services;
- Possession of fundamental scientific and methodological knowledge in the field of technical regulation and metrology;
- Readiness for the practical use of issues of production technology, processing, standardization, quality assurance and safety, regulatory legal acts in the field of production of crop and livestock products
In the process of studying in this specialty, students will acquire the following skills:
- organizational and managerial;
- production and technological;
- calculation and design;
- inspection and audit;
- experimental research;
- expert-analytical

Bridges and pipes
CODE - CIV598
CREDIT - 5 (1/0/2)
Prerequisite - no

PURPOSE AND OBJECTIVES OF THE COURSE

The discipline is aimed at providing theoretical and practical training of specialists in the design of bridges and pipes at the level of higher professional education, forms the skills of the basic principles of bridge design, design specifications and basic structures of bridges, basic methods for calculating bridge elements from various materials.

BRIEF DESCRIPTION OF THE COURSE

Includes sections: construction of road culverts, applied issues of soil mechanics in static calculations of pipes under embankments of roads, theoretical foundations of static calculation of culverts on highways, construction of culverts. Modern designs of artificial structures are studied based on the analysis of domestic and foreign experience, as well as the theory and calculation of bridges, presented as a specific application of the methods of structural mechanics and building structures.

Includes sections: characteristics and materials of supports, structures of abutments and piers, bases and foundations of supports, protection of the surface of supports, reinforced concrete bridges, slab and rib spans, prestressed spans, prefabricated reinforced concrete bridges, continuous bridges, cantilever and frame bridges, arch bridges . Training in modern methods of designing and constructing metal bridges on roads and railways. Includes sections: scope, types and parts of metal bridges, connections in metal bridges, superstructures with solid beams and through trusses, bearing parts, features of the bridge deck and tracks on metal bridges. Studying the course forms the skills of designing metal bridges.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

know:

- general information about artificial structures on railways;
- principles of calculation and design of reinforced concrete, metal and wooden bridges;
- information about pipes and tunnels;
- questions of operation and reconstruction of bridges. be able to:
- determine the forces in the sections of reinforced concrete, steel and steel-reinforced concrete beams;
- determine the forces in the roadway slab in the truss elements;
- to carry out the calculation of the bridge structure.

Digital modeling of construction objects BIM
CODE - CIV511
CREDIT - 5 (1/1/1)
Prerequisite - Mathematics I, Engineering Graphics

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of teaching the discipline "Digital Modeling of Construction Objects BIM" is to master students of modern methods and means of computer graphics; acquisition of knowledge and skills in building three-dimensional geometric models of objects using a graphic system.

The tasks of mastering the discipline

The student, in accordance with the types of professional activity, must solve the following professional tasks:

In the field of research and design activities:

- collection and systematization of information and initial data for the design of structures, engineering systems and equipment, planning and development of populated areas;
- calculation and design of parts and assemblies using standard design automation tools;
- preparation of design and working technical documentation, registration of completed design works;
- ensuring compliance of developed projects and technical documentation with the task, standards, norms and rules, specifications and other executive documents.

In the field of production-technological and production-management activities:

- organization of workplaces, their technical equipment, placement of technological equipment;
- control over the observance of technological discipline;
- maintenance of technological equipment and machines;
- organization of metrological support of technological processes, use of standard methods for quality control of construction, manufactured products, machinery and equipment;
- participation in work on fine-tuning and development of technological processes in the course of construction preparation, production of building materials, products and structures, manufacture of machinery and equipment;
- implementation of environmental safety measures;
- organizing the work of small teams of performers, planning the work of personnel and payroll funds;

- preparation of technical documentation (work schedules, instructions, plans, estimates, applications for materials, equipment), as well as established reporting according to approved forms;
- performance of works on standardization and preparation for certification of technical means, systems, processes, equipment and materials;
- execution of documentation of the quality management system of the enterprise
- development of operational plans for the work of the primary production unit;
- analysis of costs and results of the production unit.

BRIEF DESCRIPTION OF THE COURSE

Basic principles of computer-aided design systems. Graphic primitives and their modification. Working with text, families, blocks, layers. Three-dimensional surfaces and bodies. Fundamentals of building drawings in the Revit system. Projections with numerical marks, construction of earthwork boundaries in the Revit system. Construction of axonometric projections by various methods ("extrusion", "rotation") in the Revit system.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of mastering the discipline, the student should know:

- hardware and software tools for the implementation of information technology
- global and local computer networks;
- design documentation, assembly drawing, geometry elements

details, axonometric projections of details, images and designations of details, basics of computer modeling.
be able to:
- apply computer technology to solve practical problems;
- use the capabilities of computer technology and software;
- build axonometric projections, make sketches using computer technology, read assembly drawings and draw up design documentation.
own:
- the main methods of working on a personal electronic computer (PC) with application software;
- computer programs for the design and development of drawings.

Fundamentals of hydrogeology and engineering geology
CODE - CIV635
CREDIT - 5 (1/1/1)
Prerequisite - Ground science and soil mechanics

PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of studying the discipline "Fundamentals of Hydrogeology and Engineering Geology" is to instill in students the skills and abilities in the design and construction of reliable, sustainable, technological and economical bases and foundations of structures. To achieve this goal, the following main tasks must be solved when studying the course:

1. To acquaint students with the goals, object and composition of engineering and geological surveys, teach them to comprehensively assess the features of the engineering and geological conditions of the construction site and the possibility of changing these conditions during the construction and operation of structures.
2. To acquaint students with modern methods for assessing the working conditions of soils in the foundation of buildings and structures and teach them to correctly use these methods to determine the stability and deformability of foundations.
3. To acquaint students with the existing methods and techniques for calculating foundations, constructive solutions for foundations and progressive methods for performing work on their construction, and on the basis of this, teach students to independently solve problems in the design and construction of foundations and foundations using rational techniques, regulatory, reference literature and computational technique.

BRIEF DESCRIPTION OF THE COURSE

It outlines the basic principles for designing bases and foundations under various soil conditions of a construction site. The features of the construction of pile foundations, deep foundations are considered. The issues of design and installation of foundations in regional conditions, the construction and reconstruction of foundations are covered.

General principles for the design of foundations and foundations, foundations in open pits on a natural foundation, pile foundations, methods of artificial improvement of foundation soils, design of foundation pits, deep foundations, buried and underground structures, construction on structurally unstable, rocky, eluvial soils and on

undercarried and undermined areas, foundations under dynamic loads, reconstruction of foundations and reinforcement of foundations.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of mastering the discipline, the student should know:

- general principles for designing bases and foundations;
- methods of artificial improvement of foundation soils; foundations in open pits on a natural basis;
- pile foundations; shallow foundations; automated design of foundations.

be able to:

- comprehensively evaluate the features of the engineering and geological conditions of the construction site and the possibility of changing these conditions during the construction and operation of structures;
- correctly use methods for assessing the conditions of soil operation in the foundation of structures to determine the stability and deformability of foundations;
- independently solve the problems of designing and building foundations and foundations using

rational methods, regulatory, reference literature and computer technology.
have skills:
- assessment of soils and their working conditions as foundations in the construction and reconstruction of buildings and structures;
- issues of design and construction of foundations;
- goals, objectives, principles of calculation of foundations;
- promising directions for the development of bases and foundations.

Computer-aided design in transport construction
CODE - CIV720
CREDIT - 5 (1/2/0)
Prerequisite -

PURPOSE AND OBJECTIVES OF THE COURSE
To study computer programs and technologies that are used in modern building design in order to improve the quality and reduce the design time, reduce the material consumption of building objects, perform alternative design, and reduce the cost of design work.

BRIEF DESCRIPTION OF THE COURSE
Modern computer programs for the calculation of building structures. Drawing up settlement schemes. Principles of construction of finite element models. Rational breakdown into finite elements. Calculation for dynamic impacts, including seismic loads. superelement modeling. Purpose of the LIRA software package. Composition of the LIRA software package and its system. Graphic environment LIR-VISOR. Purpose and capabilities of the design systems LIR-STK and LIR-ARM. Analysis of calculation results. Sign rules when reading calculation results. Force reading rules for finite elements. Documentation.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student should know:
- basic provisions and design tasks;
- the main modern computer programs used to calculate buildings and structures, as well as building structures and their elements;
- the main computer technologies used in the design;
- advantages and disadvantages of certain programs;
- loads and impacts on the considered model of the calculated object;
- the procedure for preparing initial data for input;
- the composition of the finished documentation obtained as a result of the calculation;
- create a design model of a construction object;
- evaluate the building model and make the necessary engineering decisions;
- perform data export to element design programs;
- to analyze the results obtained after the execution of the programs.
be able to:

- practical use of modern computers to perform mathematical calculations, registration of calculation results;
- modern scientific literature;
- modern information technologies, including methods for obtaining, processing and storing scientific information;
- in calculations and design of engineering tasks;
- in the use of normative and technical literature.
own:
- modern computer programs and technologies for their use in the design of buildings and structures.

Geology and soil mechanics
CODE - CIV634
CREDIT - 5 (1/1/1)
Prerequisite - Building structures, Engineering mechanics

PURPOSE AND OBJECTIVES OF THE COURSE
To assess the existing foundations during the reconstruction of buildings and structures, to assign the main dimensions of the foundations, underground and aboveground structures, which would ensure their reliability, durability and economy; choose methods for constructing foundations and underground structures without violating the natural structure of foundation soils.

BRIEF DESCRIPTION OF THE COURSE
The purpose of teaching the discipline is to familiarize future specialists with the general provisions of modern methods of calculation, design and construction of foundations, foundations and underground structures. The foundations of natural laying, deep laying, their calculation and design are considered. Pile foundations, their classification, calculation and design. Features of the design of foundations on loess subsidence soils, on weak silt-clayey water-saturated and swelling soils. Artificial compaction and strengthening of foundation soils. Features of designing foundations under seismic conditions.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student should know:
- features of foundation arrangement near existing buildings;
- features of the production of works on the construction of foundations.
own:
- modern methods of calculation and design, arrangement of bases and foundations and underground structures

Organization of traffic safety in transport
CODE – CIV910
CREDIT - 5 (1/0/2)
Prerequisite -

PURPOSE AND OBJECTIVES OF THE COURSE
In the process of studying this course, the student must acquire theoretical knowledge and practical skills in the field of construction organization as an industry, namely: who is involved in the investment process, what are the connections between them and their responsibilities. It is also necessary to train students in advanced methods of organizing construction and installation work during the construction of transport facilities.
The purpose of studying this course is to prepare qualified specialists-organizers of production who know the basics of the organization and are able to use them in future practical activities in construction organizations.

BRIEF DESCRIPTION OF THE COURSE
It outlines the basic information on the organization of construction production; design organization of construction and preparation for construction; basics of the flow organization of construction; construction scheduling for the facility; organization of geodetic works at the construction site; stroygenplan object; construction quality control.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
As a result of studying the discipline, the student should know and be able to:
– advanced methods of construction and installation works in the construction of transport facilities;
- the existing system of preparation of construction production;
- the existing system of providing and completing construction organizations with material and technical resources;
– system of operational planning and dispatching system for managing construction production;
- methods of modeling construction production;
- organization of design and surveys, initial data and composition of the POS, PPR, POR;
- to develop the main sections of the PPR for individual structures, to know the principles for the development of the main parts of the PIC and POR;
– to design construction plans of individual structures;

- develop linear and network schedules for the construction of structures with given restrictions;
– to ensure the quality of construction and installation works.

Technology of construction of bridges and tunnels
CODE - CIV533
CREDIT - 5 (2/0/1)
Prerequisite -

PURPOSE AND OBJECTIVES OF THE COURSE
The study of the organization and technologies of bridge construction, the formation of knowledge of the technology of erection of reinforced concrete, metal and steel-reinforced concrete superstructures of bridges.

BRIEF DESCRIPTION OF THE COURSE
Includes sections: inventory structures for the construction of bridges, construction of foundations for bridge supports, construction of bridge supports. Methods of work performance, lifting equipment and quality control of work on the construction of supports and foundations of bridge supports; installation of prefabricated reinforced concrete beam-cut, beam-continuous, and monolithic superstructures; installation of metal and steel-reinforced concrete superstructures.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
know:
- fundamentals of technology for the construction of bridges and tunnels;
- organization and technology of maintenance and repair of roads;
- to be able to organize and ensure road safety:
- determine the roughness of the coating.

Subways
CODE - CIV643
CREDIT - 5 (1/2/0)
Prerequisite -

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of studying the discipline is the ability to determine the load on the supporting structures of all metro structures and perform their calculation; To have an idea about the features of geodetic works for subways, about the physical essence of the processes occurring in the soil mass during the opening of the working; on ventilation and lighting, power supply, signaling, centralization, water supply, sewerage and heating in subways. Organize and supervise all types of construction and installation works.

BRIEF DESCRIPTION OF THE COURSE
In the discipline "Metropolitans" are studied: the basic principles of design, construction, internal arrangement of distillation tunnels and metro stations, hydrotechnical, municipal and navigable tunnels and tunnels of urban intersections. Students should master skills and instill skills in the field of design, construction of tunnel linings and calculation of linings of subway stations. The study of the discipline is based on the use of optimal planning methods.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
Able to apply design methods and mathematical modeling, principles of organization and management of bridge-tunnel and oil and gas production to determine the degree of stability, durability, reliability and cost-effectiveness of structures of artificial structures during operation and reconstruction using lifting mechanisms and machines, as well as the use of general construction machines and equipment

Geotechnics in foundation engineering
CODE - CIV637
CREDIT - 5 (1/0/2)
Prerequisite - Geology and soil mechanics, Fundamentals of hydrogeology and engineering geology

PURPOSE AND OBJECTIVES OF THE COURSE
The purpose of teaching the discipline is to teach students the basics of modern calculations, design and installation of foundations that ensure the reliability and durability of transport structures in difficult soil construction conditions, as well as the skills of self-improvement of their knowledge and deepening practical experience in the field of geotechnical design in special conditions.

BRIEF DESCRIPTION OF THE COURSE
Owns methods of calculation of technical means used in engineering geodesy and geoinformatics, hydrogeology and engineering geology, soil mechanics, foundation engineering. Able to carry out engineering surveys of transport facilities with geodetic, hydrometric and engineering-geological work, conduct calculations on engineering geodesy and geoinformatics, hydrogeology and engineering geology and soil mechanics, design the foundations of the corresponding transport facilities. Use methods for designing subgrades, artificial structures on roads and airfields.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE
Knows and owns the main methods, methods and means of obtaining, storing and processing information in engineering geodesy and geoinformatics, hydrogeology and engineering geology in the construction of transport facilities

Electrical and Electronics
CODE - ELC101
CREDIT - 5 (1/1/1)
Prerequisite - Mathematics. Computer science.

GOAL AND OBJECTIVES OF THE COURSE

Teaching students the choice of elements of electrical engineering and microelectronics, the principles and methods of calculation of electric circuits, scientific foundations and the current state and development of microelectronics. It extends and develops the training of engineers, master modern technology of construction and calculation, as well as the choice of electronic devices for the digital economy.

BRIEF DESCRIPTION OF THE COURSE

The course " Electrical and Electronics " occupies an important place among the technical disciplines that determine the theoretical level of professional training of specialists in the modern education system. The main objectives of the course isthe generation of knowledge in the field of microelectronics theoretical principles; mastering abilities and skills assessment of functional, qualitative and quantitative characteristics of the chip components for electrical and electronic devices.

Knowledge, skills, skills to complete the course

The course " Electrical and Electronics " gives students knowledge of the electrical and magnetic phenomena and their use for practical purposes and provides comprehensive training of future specialists.

On completion of the course the student will receive:

- skills to independently carry out the calculation of the main types of active elements of digital and analog integrated circuits, to carry out selection of the required technological processes, make decisions independently within their professional competence;
- to analyze the various types of reasoning, speak publicly, convincingly lead the discussion and debate;
- to attract to address emerging in the course of professional activities corresponding to the problems of physical and mathematical apparatus, methods of mathematical analysis and modeling, theoretical and experimental research;
- to analyze the scientific and technical information, to study domestic and foreign experience in the field of modern micro- and nanoelectronics;
- use of information technology in its substantive work;
- use the information for new design solutions, manufacturing processes and new types of processing equipment to improve production technology products of semiconductor technology.

Construction Materials
CODE - GEN408
CREDIT - 5 (1/1/1)
Prerequisite -Fizika I

GOAL AND OBJECTIVES OF THE COURSE

purpose of teachingdiscipline "Building materials" as one of the first engineering disciplines is to prepare a specialist who knows the fundamentals of materials science of building materials with the desired properties; questions of durability of materials; their role is to provide the highest quality of operational, environmental cleanliness, efficiency and aesthetics.

The main task of studying this discipline is understanding of the industry's leading position in the production of key building materials and products: the rational use of raw materials in an environmentally sound, cost of fuel and energy and other material resources in the production of building materials and products, appropriate to the purpose.

BRIEF DESCRIPTION OF THE COURSE

"Building materials" - one of the main subjects for the builders of all trades. All buildings and structures are erected from building materials, so the right of choice, the ability to assess their quality and state of preservation, as well as to ensure normal operating conditions of structures made of these materials - all you need to know the students of our specialty.

Knowledge, skills, skills to complete the course
As a result of studying the discipline the student should know:

- range of building materials and their properties;
- features of their structure, raw materials;
- the essence of the operation and processes of processing of raw materials;
- technology production of various building materials, costs, etc.

be able to:

- Literacy is defined characteristics of building materials;
- support the choice of materials and products in the design solutions for the given conditions of operation;
- High quality materials;
- to predict the reliability and durability of the materials in the construction;
- determine the economic efficiency of the production and use of building materials and products;
- to carry out the production control;
- to evaluate the properties of building materials and products amounts and well-versed in teaching the principles of their determination.

own:

- material science basics of obtaining building materials with the desired properties.

Geotechnica 2
CODE - CIV734
CREDIT - 5 (1/1/1)
Prerequisite - Physics

BRIEF DESCRIPTION OF THE COURSE

Brief content of the discipline. The discipline "Geotechnics 1", consisting of 2 sections - "Engineering Geology" and "Soil Mechanics" is included in the list of the cycle of basic disciplines (BD), the mastery of which determines the qualifying academic bachelor's degree in the areas of training 6B07118 - " Transport facilities".

In the section "Engineering Geology" the following issues are studied: the structure and physical properties of the Earth, minerals and rocks, geological processes, the basics of hydrogeology, engineering and geological surveys during the construction of transport facilities.

In the section "Soil Mechanics" the following issues are studied: physical and mechanical properties of soils, methods of experimental research of soils, calculations of stresses and deformations in soils, stability of slopes and retaining walls.

PURPOSE AND OBJECTIVES OF THE COURSE

Purpose: the disciplines "Geotechnics II" are the basis for the study of all general engineering and technical disciplines, and also provide an opportunity to correctly assess the properties of soils in the base, their joint work with the foundation and above-foundation structures. This, in turn, makes it possible to rationally choose the type of base and foundation, their dimensions and perform construction work in a quality manner.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

Learning outcomes: The student should be able to:

– analyze

- predict

At the end of the course the student should know:

– the basics of engineering geology and soil mechanics, necessary for solving practical problems of assessing and analyzing the engineering and geological conditions of construction sites for transport and civil structures.

- find a logical correspondence between the various requirements of regulatory literature in the design and installation of foundations for buildings and structures (engineering and geological conditions, loads and impacts, bearing capacity, deformations and displacements, technical and economic indicators) and make the most optimal decisions.

Fundamentals of organizing and planning the construction of transport facilities
CODE - CIV908
CREDIT - 5 (1/0/2)
Prerequisite - "Mathematics", "Physics", "Engineering Mechanics", "Building Materials", "Informatics", "Construction Machinery and Equipment".

PURPOSE AND OBJECTIVES OF THE COURSE

To give students knowledge, skills and abilities, which are a statement of the foundations of modern rational organization of transport construction, a method of current and operational planning and management of transport construction, modeling and computer-aided design of construction organization.

BRIEF DESCRIPTION OF THE COURSE

Types of transport construction. Ways of organizing construction. Organization of in-line construction. Basic parameters of in-line construction. rhythmic flows. Rhythmic flows. Matrix methods for calculating schedules for in-line construction. Purpose and types of models. General concept of network planning. The composition of the network model. Calculation of the network diagram by the sector method. Calculation of the network graph by the tabular method. Project for the organization of construction (POS) and production of works (PPR). Varieties of norms in construction. Organization of material and technical support. The impact of PIC on the estimated cost.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

main types of construction works and processes; basics of technical and tariff regulation in the construction industry; project for the production of works and a project for the organization of construction; technology of excavation and other types of construction works; technology for the construction of transport facilities using efficient materials and structures.

be able to:

determine the effectiveness of technological solutions in the performance of various types of construction work and processes; develop a project for the production of construction works and a project for organizing the construction of transport facilities.

own:

methods for performing field and laboratory experimental studies of the construction object; methods of quality control of construction works and processes; methods of quality control of construction works and processes.

Organization of construction
CODE - CIV909
CREDIT - 5 (1/0/2)
Prerequisite - "Mathematics", "Physics", "Engineering Mechanics", "Building Materials"

PURPOSE AND OBJECTIVES OF THE COURSE

To give students knowledge, skills and abilities, which are a statement of the foundations of modern rational organization of transport construction, a method of current and operational planning and management of transport construction, modeling and computer-aided design of construction organization.

BRIEF DESCRIPTION OF THE COURSE

Types of transport construction. Ways of organizing construction. Organization of in-line construction. Basic parameters of in-line construction. rhythmic flows. Rhythmic flows. Matrix methods for calculating schedules for in-line construction. Purpose and types of models. General concept of network planning. The composition of the network model. Calculation of the network diagram by the sector method. Calculation of the network graph by the tabular method. Project for the organization of construction (POS) and production of works (PPR). Varieties of norms in construction. Organization of material and technical support. The impact of PIC on the estimated cost.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

main types of construction works and processes; basics of technical and tariff regulation in the construction industry; project for the production of works and a project for the organization of construction; technology of excavation and other types of construction works; technology for the construction of transport facilities using efficient materials and structures.

be able to:

determine the effectiveness of technological solutions in the performance of various types of construction work and processes; develop a project for the production of construction works and a project for organizing the construction of transport facilities.

own:

methods for performing field and laboratory experimental studies of the construction object; methods of quality control of construction works and processes; methods of quality control of construction works and processes.

Organization and planning of construction of oil and gas facilities
CODE – CIV511
CREDIT - 5 (1/0/2)
Prerequisite - Oil and gas pipelines, Oil and gas storage facilities, Pumping and compressor stations in oil and gas production, Maintenance and repair of oil and gas pipelines, Ensuring traffic safety in transport, Technical operation of transport and traffic safety Oil and gas construction technology, Construction production technology

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PURPOSE AND OBJECTIVES OF THE COURSE

To give students knowledge, skills and abilities, which are a statement of the foundations of modern rational organization of transport construction, a method of current and operational planning and management of transport construction, modeling and computer-aided design of construction organization.

BRIEF DESCRIPTION OF THE COURSE

Types of transport construction. Ways of organizing construction. Organization of in-line construction. Basic parameters of in-line construction. rhythmic flows. Rhythmic flows. Matrix methods for calculating schedules for in-line construction. Purpose and types of models. General concept of network planning. The composition of the network model. Calculation of the network diagram by the sector method. Calculation of the network graph by the tabular method. Project for the organization of construction (POS) and production of works (PPR). Varieties of norms in construction. Organization of material and technical support. The impact of PIC on the estimated cost.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

Knows: the main types of construction work and processes; basics of technical and tariff formation in the construction industry; principles of designing the construction of oil and gas facilities; project for the production of works and a project for the organization of construction; technology for the production of earthen, concrete, stone, installation, roofing, finishing and other types of construction work; technology for the construction of oil and gas facilities using efficient materials and structures

be able to:

determine the effectiveness of technological solutions in the performance of various types of construction work and processes; ensure the quality of construction work and processes; develop a project for the production of construction works and a project for organizing the construction of oil and gas facilities.

own:

methods for performing field and laboratory experimental studies of the construction object; methods of quality control of construction works and processes; methods of quality control of construction works and processes.

Organization and planning of construction of bridges, tunnels and subways
CODE - CIV 658
CREDIT - 5 (1/0/2)
Prerequisite- Mathematics 1,2, Ecology and life safety, Engineering geodesy and geoinformatics, Materials science and technology of structural materials, Electrical engineering and fundamentals of electronics. Strength of materials. Bridges and pipes

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PURPOSE AND OBJECTIVES OF THE COURSE

To give students knowledge, skills and abilities, which are a statement of the foundations of modern rational organization of transport construction, a method of current and operational planning and management of transport construction, modeling and computer-aided design of construction organization.

BRIEF DESCRIPTION OF THE COURSE

Types of transport construction. Ways of organizing construction. Organization of in-line construction. Basic parameters of in-line construction. rhythmic flows. Rhythmic flows. Matrix methods for calculating schedules for in-line construction. Purpose and types of models. General concept of network planning. The composition of the network model. Calculation of the network diagram by the sector method. Calculation of the network graph by the tabular method. Project for the organization of construction (POS) and production of works (PPR). Varieties of norms in construction. Organization of material and technical support. The impact of PIC on the estimated cost.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

main types of construction works and processes; basics of technical and tariff formation in the construction industry; design principles for the construction of bridges, pipes, tunnels and subways; project for the production of works and a project for the organization of construction; technology for the production of earthen, concrete, stone, installation, roofing, finishing and other types of construction work; technology for the construction of bridges, pipes, tunnels and subways using efficient materials and structures.

be able to:

determine the effectiveness of technological solutions in the performance of various types of construction work and processes; ensure the quality of construction work and processes; develop a project for the production of construction works and a project for organizing the construction of bridges, pipes, tunnels and subways.

own:

methods for performing field and laboratory experimental studies of the construction object; methods of quality control of construction works and processes.

Organization of traffic safety in transport
CODE - CIV910
CREDIT - 5 (1/0/2)
Prerequisite-"Mathematics", "Physics", "Engineering Mechanics", "Building Materials", "Informatics", "Construction Machinery and Equipment".

PURPOSE AND OBJECTIVES OF THE COURSE

The study by students of the course "Ensuring traffic safety in transport" is necessary to gain knowledge about the basics of transport security, to acquire skills in planning and implementing transport security.

BRIEF DESCRIPTION OF THE COURSE

The discipline studies the following issues: Basic concepts of the system for ensuring traffic safety in modes of transport. Indicators of reliability of technical devices operation. Supervision in the field of transport security. Regulatory framework for ensuring transport security. Fundamentals of ensuring traffic safety by means of transport.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

- demonstrate skills in mastering the basic methods, methods and means of planning and implementing measures to ensure transport security;

be able to:

- conduct official negotiations on the organization of traffic in transport; traffic safety skills; skills to control compliance with labor and technological discipline by employees who are in operational subordination, with the adoption of corrective measures in case of violation of labor protection requirements, regulatory documentation

own:

- the skills of organizing emergency recovery work and timely troubleshooting of technical means and equipment with the adoption of appropriate measures in the event of unusual situations, violations and malfunctions.

Ensuring traffic safety in transport
CODE – CIV639
CREDIT – 5 (1/0/2)
Prerequisite-"Mathematics", "Physics", "Engineering Mechanics", "Building Materials", "Informatics", "Construction Machinery and Equipment".

PURPOSE AND OBJECTIVES OF THE COURSE

The study by students of the course "Ensuring traffic safety in transport" is necessary to gain knowledge about the basics of transport security, to acquire skills in planning and implementing transport security.

BRIEF DESCRIPTION OF THE COURSE

The discipline studies the following issues: Basic concepts of the system for ensuring traffic safety in modes of transport. Indicators of reliability of technical devices operation. Supervision in the field of transport security. Regulatory framework for ensuring transport security. Fundamentals of ensuring traffic safety by means of transport.

KNOWLEDGE, SKILLS AFTER COMPLETING THE COURSE

As a result of studying the discipline, the student should know:

- demonstrate skills in mastering the basic methods, methods and means of planning and implementing measures to ensure transport security;

be able to:

- conduct official negotiations on the organization of traffic in transport; traffic safety skills; skills to control compliance with labor and technological discipline by employees who are in operational subordination, with the adoption of corrective measures in case of violation of labor protection requirements, regulatory documentation

own:

- the skills of organizing emergency recovery work and timely troubleshooting of technical means and equipment with the adoption of appropriate measures in the event of unusual situations, violations and malfunctions.

Protection of the thesis / degree project
CODE - ECA103
CREDIT - 6
Prerequisite - no

GOAL AND OBJECTIVES OF THE COURSE

The main aim of the thesis / design is to systematize and deepen the knowledge acquired by students of all time university studies, the development of computational and engineering skills of the designer, the preparation for the independent decision of engineering problems in the design and construction of buildings and structures, as well as the design and calculation of the production building materials, products and structures.

The objectives of the thesis / design includes the development of each graduate student of all parts of the project in strict accordance with the approved six individual tasks and the proper execution of drawings and settlement and the explanatory note submitted by the defense.

BRIEF DESCRIPTION OF THE COURSE

Diploma thesis / project - independent work aimed at solving specific technical problems encountered in the design and construction of buildings, production of building materials. The work on the diploma work / project consists of two phases - pre-diploma practice and diploma projects. Thesis - independent scientific research aimed at studying actual scientific and technical problems to produce concrete results with scientific and practical significance in the field of construction. Performed thesis / project under the individual plan, issuing department.

Knowledge, skills, skills to complete the course

- mastering the technique of analysis, research and experimentation to solve practical problems;
- the development of skills of independent work with the normative and technical documentation, instructional materials and scientific literature;
- the acquisition of correct statement of problems, the formalization of the tasks of research and findings;
- mastering the skills of practical work in the field of design and calculation of building designs, construction technologies, planning the construction process of building organizations, technology and calculation of building materials, products and structures;
- correctly apply the theoretical principles of technical and professional disciplines;
- be able to use modern methods of technical and economic analysis;
- competently perform specific organizational and economic calculations;
- to apply advanced methods of investigation, to introduce the achievements of science and technology and management and justify the economic feasibility of their implementation.

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