JSC "ALT University named after Mukhamedzhan Tynyshpayev"

APPROVE
US ALT decision dated
"27" 03 2025 (Protocol №8)
President-Rector
Zharmagambetova M.S.

EDUCATIONAL PROGRAM

NAME: 6B07183 – SMART ROADS: DIGITAL TECHNOLOGIES IN TRANSPORT STRUCTURES

LEVEL OF TRAINING: BACHELOR'S DEGREE

CODE AND CLASSIFICATION OF AREAS OF STUDY: 6B071 – ENGINEERING AND ENGINEERING

CODE AND GROUP OF EDUCATIONAL PROGRAMS: B166 – TRANSPORT FACILITIES

DATE OF REGISTRATION IN THE REGISTER: 26.05.2025
REGISTRATION NUMBER: 6B07100143

Almaty, 2025

CONTENT

1. INFORMATION ABOUT CONSIDERATION, APPROVAL AND APPROVAL OF THE PROGRAM, DEVELOPERS, EXPERTS AND REVIEWERS

1 DEVELOPED:		
Associate Professor *(job title)*	_____ *(signature)*	Espaeva G.A. *(FULL NAME)*
Apple Build Project LLP *ch.engineer* *(job title)*	_____ *(signature)*	Kurmanbekov J.K. *(FULL NAME)*
Associate Professor ALT *(job title)*	_____ *(signature)*	Uteshbaeva A.A. *(FULL NAME)*
Head of the Department of "ASI" (job title)	_____ (signature)	Kulmanov K.S. (FULL NAME)
Associate Professor ALT *(job title)*	_____ *(signature)*	Dyusengalieva T.M. *(FULL NAME)*
2 EXPERTS:		
Saulet-SKB LLP, Direktor *(job title)*	_____ *(signature)*	Oshanov A.E. *(FULL NAME)*
«Kazakh Promtransportprojekt» *LLP ch.engineer* *(job title)*	_____ *(signature)*	Musaev M.T. *(FULL NAME)*
3 REVIEWER:		
Associate professor of "TSiU" *KazADI named after* *L.Goncharov* *(job title)*	_____ *(signature)*	*Abiev B.A.* *(FULL NAME)*
4 REVIEWED AND RECOMMENDED:		
AC meeting (department) «ASI» *Protocol №7, «18» 02.2025г*	_____ *(signature)*	Kulmanov K.S *(FULL NAME)*
UMB meeting «TaC» *Protocol №8, «17»03.2025г*	_____ *(signature)*	Abdreshov SH.A. *(FULL NAME)*
EMC meeting *Protocol №4, «20»03.2025г*	_____ *(signature)*	Kojabergenova A.K. *(FULL NAME)*

5 **APPROVED** by the decision of the Academic Council dated «__27__» _03___2025г. №8

6 **UPDATED**

2. REGULATORY REFERENCES

1. The educational program has been developed on the basis of the following normative legal acts and professional standards:

2. The Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 No. 319-III (with amendments and additions as of March 27, 2023).

3. The National Qualifications Framework, approved by the protocol of March 16, 2016 of the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.

4. The sectoral qualifications Framework for Education, approved by the Minutes of the meeting of the Sectoral Commission of the Ministry of Education and Science of the Republic of Kazakhstan on social Partnership and Regulation of social and labor relations in the field of education and science dated November 27, 2019 No. 3.

5.The State Mandatory Standard of Higher Education (Order No. 66 of the Minister of Science and Higher Education of the Republic of Kazakhstan dated February 20, 2023).

6. Qualification directory of positions of managers, specialists and other employees, approved by the Order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated August 12, 2022 No. 309.

7. Rules for the organization of the educational process on credit technology of education in organizations of higher and (or) postgraduate education, approved by the Order of the Minister of the Ministry of Education and Science of the Republic of Kazakhstan No. 152 dated 04/20/2011. (with additions and amendments dated April 04, 2023 No. 145).

8. Classifier of training areas with higher and postgraduate education, approved by Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 13, 2018 No. 569 (with amendments and additions as of June 05, 2020).

9. Algorithm for the inclusion and exclusion of educational programs in the Register of Educational Programs of Higher and Postgraduate Education, approved by Order of the Minister of Education and Science of the Republic of Kazakhstan dated December 4, 2018 No. 665 (with additions and amendments as of December 23, 2020 No. 536).

10. RI-ALT-33 "Regulation on the procedure for development educational programs of higher and postgraduate education".

11. RI-ALT-33 "Regulations on the order of the

3. PASSPORT OF THE EDUCATIONAL PROGRAM

№	Field name	Note
1	Registration number	6B07100143
2	Code and classification of the field of education	6B07 Engineering, Manufacturing and Civil engineering
3	Code and classification of training areas	6B071 Engineering and engineering trades
4	Code and group of the educational program (OP)	B166 Transport facilities
5	Name of the educational program (OP)	6B07183 – Smart Roads: digital technologies in transport structures"
6	Type of educational program (OP)	New EP
7	The purpose of the educational program (OP)	Training of personnel in demand in the labor market for the road industry for the operation of transport facilities, with innovative and professional competencies and skills to solve current and production problems.
8	Level according to the International Standard Classification of Education (ISCED)	6
9	National Qualification Framework (NQF) level	6
10	Level according to the Industry Qualification Framework (ORC)	6
11	Distinctive features of the educational program (OP)	No
	Partner university, joint educational program (SOP)	-
	Partner university, double-degree educational program (DDOP)	-
12	Form of training	Full-time, full-time with the use of DOT
13	Language of instruction	Kazakh, Russian
14	Volume of loans	241
15	Academic degree awarded	Bachelor of Engineering and Technology in the educational program "6B07183 SMART ROADS: Digital technologies in transport facilities"
16	Availability of an appendix to the license for the direction of training	KZ87LAA00036465
17	Availability of educational program accreditation (OP)	Available
	Name of the accreditation body	NU "Independent Agency of accreditation and rating"
	Validity period of accreditation	26.05.25 - 31.03.30

4. THE GRADUATE'S COMPETENCE MODEL

The purpose of the educational program: Training of personnel in demand in the labor market for the road industry for the operation of transport facilities, with innovative and professional competencies and skills to solve current and production problems.

Objectives of the educational program:

1. Formation of a person capable of professional activity to participate in the survey and design of highways and airfields, in the organization of works on the production of road-building materials, in the organization of works on the construction of highways and airfields, in the operation of highways and airfields.
2. Formation of the ability to carry out work on the continuation of the route on the ground and the restoration of the route in accordance with the project documentation; to maintain and execute the documentation of the survey party.
3. Formation of the ability: to design a route plan, longitudinal and transverse road profiles; to make technical and economic comparisons; to use modern computer equipment; to use personal computers and programs for them for the design of highways and airfields; to draw up design documentation; to navigate the main stages of preparing the field for development.
4. Formation of the ability to: reasonably choose the working schemes of mining equipment; establish the technological sequence of preparation of asphalt concrete, cement concrete and other mixtures according to the schemes; build, maintain and repair highways and airfields, independently form tasks and determine ways to solve them within professional competence; work with regulatory documents, standard design and technological documentation; use modern information technology;
5. Assistance in the formation of a graduate's readiness to: assess and analyze the condition of highways, airfields and their structures; develop a technological sequence of processes for the maintenance of various types of coatings and elements of road and airfield construction; perform

calculations of the need for snow removal machines from highways and airfields and the distribution of deicing materials on them; develop a technological sequence of processes.

6. Formation of graduates' readiness to determine the types of work to be accepted and assess the quality of repair and maintenance, highways and airfields.

7. Assistance in the formation of graduates' readiness for the economical and safe use of natural resources, energy and materials in the design, construction, survey and design of highways and airfields

Learning outcomes:

LR1 – Apply knowledge and skills in the field of transport facilities, patterns of sustainable development, as well as socio-economic, legal, ethical and political aspects, using linguistic competencies to solve problems in an interdisciplinary, multilingual and inclusive environment.

LR2 - To develop more efficient and economical structures based on knowledge of natural sciences, mechanics and analysis of the behavior of transport structures under the influence of transport loads and natural factors

LR3 - Create engineering drawings and design documents using computer programs and artificial intelligence.

LR4- Apply national and international standards governing the activities of quality management and applicable regulatory documents related to digital technologies in transport facilitiesZ

LR5- Demonstrate the acquired knowledge of geomechanical and hydraulic engineering sciences. during the construction of smart highways, ensuring their safety, stability and functionality.

LR6 – Analyze design, engineering and technological solutions to assess technical and economic efficiency based on estimated pricing in the engineering of transport facilities

LR7 - To evaluate the accuracy and reliability of geodetic measurements and results obtained using digital technologies.

LR8 - Plan and implement professional development using knowledge in economics, financial literacy, anti-corruption culture, ecology, life safety, sustainable development and research methods to make informed decisions and manage resources, taking into account the values of digital inclusion in various fields of activity.

LR9 – Possess basic knowledge about the mechanical properties of building materials, building structures, and their ability to withstand loads in the field of digital technologies to solve problems in the engineering of transport structures.

LR10 – Possess the ability to acquire new knowledge through modern information technology for use in the field of digital technologies in transport facilities.

LR11 – Understand the principles of organizing and managing traffic flows, applying knowledge about modern technologies and methods of improving safety, such as automated traffic control systems, video surveillance and other IT solutions

LR12 - Apply tasks to optimize the process of construction and repair of road infrastructure using specialized equipment to achieve maximum efficiency, safety and quality of work.

Field of professional activity: Automobile and aviation transport: design, construction, maintenance and repair of highways and airfields

Objects of professional activity:

- local executive authorities in the field of road transport and their regional structures;

- organizations and enterprises of the transport industry in the field of design, construction, maintenance and repair of highways and airfields, the highway network of highways, city and village streets and access roads of industrial enterprises;

- organizations and enterprises in the field of manufacturing of building materials and structures for objects of the transport and communication complex.

Types of professional activity:

1. Preparation of initial data for the development of a work production project (PPR), including using the Project Information Model (PIM) (if necessary) (when using TIMSO in the organization):

- preparation of work descriptions, specifications, tables and other technical documentation for the development of linear and network schedules of work;
- development of technological and labor process maps;
- preparation of information for operational meetings on the progress of construction;
- preparation of statements and other technological documentation;
- calculation of operational norms of consumption of materials, tools, fuel and electricity, labor costs;
- preparation of applications for technological equipment. Tools, devices for construction production Implementation of optimal production modes.

2. Making suggestions for improving the quality of work.

3. Drawing up plans for the placement of equipment, technical equipment and organization of workplaces.

4. Calculation of production capacity and equipment loading.

The list of specialist positions: Head of the Capital Construction Department, head of the production (technical, production and technical) department, head of the site (workshop), head of the logistics Department, Head of the Safety and Labor Protection Department, Head of the regulatory research Laboratory for Labor, Head of the tool Department, head of the production laboratory (production control), head of the quality control department, head of the road laboratory, site master (road master), work producer (foreman), master of industrial training, foreman, project manager, project manager, lead engineer, design engineer, process engineer (technologist), repair engineer, inventory engineer of buildings and structures, metrology engineer, labor organization engineer, labor rationing engineer, safety and labor protection engineer, engineer for environmental protection (ecologist), laboratory engineer, engineer, chief specialist, leading specialist, specialist, design technician, site technician, process technician, inventory technician of buildings and structures, metrology technician, labor technician, technician, laboratory technician, laboratory assistant

Professional certificates obtained at the end of training: Road worker, asphalt concrete worker.

Requirements for the previous level of education: general secondary, technical and vocational, post-secondary, higher education (bachelor's degree).

In the course of training, students undergo various types of professional practice:

- educational;
- production;

- pre-graduation.

Educational practice.

During the internship, students should get an idea of the role of transport equipment in the country's economy, the variety of vehicles, the importance of mechanization and automation in increasing labor productivity, as well as an idea of the main technological processes of operation, maintenance and repair of transport equipment and technology of transport enterprises.

Production practice 1.

During the period of practical training, the student receives certain practical knowledge, skills and abilities according to the chosen Educational program.

The objectives of the practical training are: deepening and consolidation of theoretical knowledge gained in the course of training; obtaining skills for the practical use of professional knowledge gained during theoretical training; training in skills for solving practical and managerial tasks; familiarity with the specifics of a bachelor's professional activity in a particular production; formation of a professional position of a specialist, a style of behavior, mastering professional ethics.

The objectives of industrial practice are to consolidate, deepen and systematize the knowledge gained during the study of theoretical basic and profile disciplines at a particular enterprise or organization and to acquire initial practical experience.

Pre-graduate practice 2.

The content of the pre-graduate practice is determined by the topic of the thesis (project). During the pre-graduate practice, the student collects factual material about the production (professional) activities of the enterprise (organization) and uses it in the development of the graduation project (work). The practice involves working out a given problem (the topic of the thesis) on the materials of the activity of a particular enterprise (organization) with the student's independent formulation of conclusions, suggestions, recommendations, etc. In the course of practice, the student must show his knowledge and skills of a specialist, organizational skills, decision-making skills, performance discipline, responsibility, initiative.

Final certification it is carried out in the form of writing and defending a thesis (project) or preparing and passing a comprehensive exam. The purpose of the final certification is to evaluate the learning outcomes and the acquired competencies achieved upon completion of the study of the educational program of higher education.

The thesis (project) aims to identify and evaluate the analytical and research abilities of the graduate and is a generalization of the results of the student's independent study of an urgent problem in the field of his chosen specialty. The comprehensive exam program reflects integrated knowledge and key competencies that meet the requirements of the labor market in accordance with the educational program of higher education.

Professional certificates obtained at the end of training: Road worker, asphalt mixer.

5. MATRIX OF CORRELATION OF LEARNING OUTCOMES ACCORDING TO THE EDUCATIONAL PROGRAM WITH ACADEMIC DISCIPLINES/MODULES

№	Name of the discipline	Number of credits	Matrix of correlation of learning outcomes according to the educational program with academic disciplines											
			LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	History of Kazakhstan	5											+	
2	Philosophy	5											+	
3	Foreign language	10									+			
4	Kazakh (Russian) language	10									+			
5	Information and communication technologies	5				+								
6	Sociology	2											+	
7	Cultural studies	2											+	
8	Political Science	2											+	
9	Psychology	2											+	
10	Physical Culture	8											+	
11	Ecology and life safety	5					+							
12	Methods of scientific research	5										+		
13	Fundamentals of Economics and Entrepreneurship	5						+						
14	Fundamentals of law and anti-corruption culture	5										+		
15	Engineering Mathematics	9	+											

17	Applied Physics	9	+											
20	Fundamentals of computer modeling	6				+								
21	Building materials	6			+									
22	Geology, soil mechanics, foundations and foundations	6			+									
23	Building structures	6			+									
24	Electrical engineering and the basics of electronics	6	+											
25	Labor protection	6					+							
26	Educational practice (geodetic)	2								+				
27	Theoretical mechanics	6		+										
28	Engineering Mechanics 1	6		+										
29	Resistance of materials	6		+										
30	Engineering Mechanics 2	6		+										
31	Construction mechanics	6		+										
32	Engineering Mechanics 3	6		+										
33	Engineering geodesy	6				+								
34	Fundamentals of geoinformatics	6				+								
35	Fundamentals of design of transport facilities	6				+								
36	Introduction to the design of transport infrastructure facilities	6				+								
37	Road construction machinery and equipment	6					+		+					
38	Mechanization of the automobile and road economy	6					+		+					

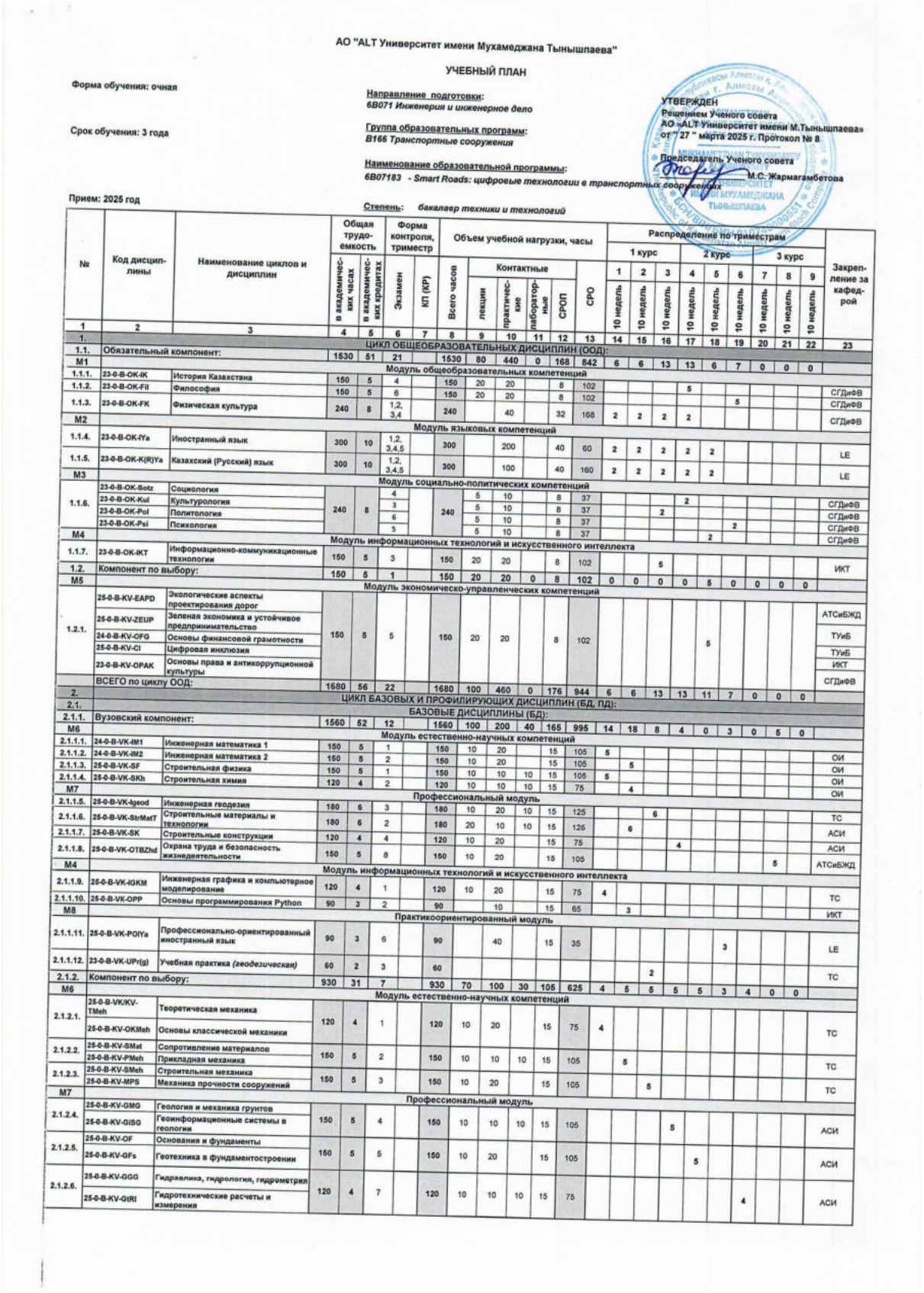
39	Artificial structures on highways	9			+									
40	Construction of highways	9					+					+		
41	Arrangement of airfields	6										+		
42	Surveys and design of highways	9						+			+			
43	Operation of highways	9								+		+		
44	Maintenance and repair of highways	9								+				
45	Technology of automobile and road construction	6			+				+					
46	Technology of construction of highways and airfields	6			+				+					
47	Organization of construction of transport infrastructure facilities	6					+		+					
48	Organization and planning of construction of transport facilities	6					+		+					
49	Modernization of highways	6								+		+		
50	Reconstruction of highways	6					+					+		
51	Managerial economics	3						+						+
52	Transport logistics	3									+	+		
53	Resource saving in transport	3					+					+		
54	Time management	3						+						+
55	Digital diagnostics of construction objects	3				+				+				+
56	Power BI Business Analytics	3				+		+						+
57	Production practice 1	3								+				+

58	Production practice 2	4								+					+
59	FINAL CERTIFICATION:	8	+	+	+	+	+	+	+	+	+	+	+		

6. STRUCTURE OF THE BACHELOR'S DEGREE PROGRAM

№ п/п	Name of cycles of disciplines	Total labor intensity	
		in academic hours	in academic credits
1	The cycle of general education disciplines (OOD)	**1680**	**56**
1)	is a mandatory component	**1530**	**51**
	History of Kazakhstan	150	5
	Philosophy	150	5
	Foreign language	300	10
	Kazakh (Russian) language	300	10
	Information and Communication Technologies (in English)	150	5
	Module of socio-political knowledge (sociology, political science, cultural studies, psychology)	240	8
	Physical Culture	240	8
2)	**Component of choice**	**150**	**5**
2	Cycle of basic disciplines (DB)	at least 5280	at least 176
1)	**University component**		
2)	**Professional practice**		
3	Cycle of profile disciplines (PD)		
1)	**University component**		
2)	**Professional practice**		
4	Additional types of training (DVO)		
1)	**Component of choice**		
5	Final certification		
1)	**Writing and defending a thesis, graduation project, or preparing and passing a comprehensive exam**	at least 240	at least 8
	Total	**at least 7200**	**at least 240**

7. CURRICULUM FOR THE ENTIRE PERIOD OF STUDY



АО "ALT Университет имени Мухамеджана Тынышпаева"

УЧЕБНЫЙ ПЛАН

Форма обучения: очная

Срок обучения: 3 года

Направление подготовки:
6B071 Инженерия и инженерное дело

Группа образовательных программ:
B166 Транспортные сооружения

Наименование образовательной программы:
6B07183 - Smart Roads: цифровые технологии в транспортных сооружениях

Степень: *бакалавр техники и технологий*

Прием: 2025 год

УТВЕРЖДЕН
Решением Ученого совета
АО «ALT Университет имени М.Тынышпаева»
от " 27 " марта 2025 г. Протокол № 8

Председатель Ученого совета
М.С. Жармагамбетова

№	Код дисциплины	Наименование циклов и дисциплин	Общая трудоемкость		Форма контроля, триместр		Объем учебной нагрузки, часы						Распределение по триместрам									Закрепление за кафедрой
								Контактные					1 курс			2 курс			3 курс			
			в академических часах	в академических кредитах	Экзамен	КП (КР)	Всего часов	лекции	практические	лабораторные	СРОП	СРО	1	2	3	4	5	6	7	8	9	
													10 недель	10 недель	10 недель	10 недель	10 недель	10 недель	10 недель	10 недель	10 недель	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1.		ЦИКЛ ОБЩЕОБРАЗОВАТЕЛЬНЫХ ДИСЦИПЛИН (ООД):																				
1.1.	Обязательный компонент:		1530	51	21		1530	80	440	0	168	842	6	6	13	13	6	7	0	0	0	
M1		Модуль общеобразовательных компетенций																				
1.1.1.	23-0-B-OK-IK	История Казахстана	150	5	4		150	20	20		8	102				5						СГДиФВ
1.1.2.	23-0-B-OK-Fil	Философия	150	5	6		150	20	20		8	102						5				СГДиФВ
1.1.3.	23-0-B-OK-FK	Физическая культура	240	8	1,2, 3,4		240		40		32	168	2	2	2	2						СГДиФВ
M2		Модуль языковых компетенций																				
1.1.4.	23-0-B-OK-IYa	Иностранный язык	300	10	1,2, 3,4,5		300		200		40	60	2	2	2	2	2					LE
1.1.5.	23-0-B-OK-K(R)Ya	Казахский (Русский) язык	300	10	1,2, 3,4,5		300		100		40	160	2	2	2	2	2					LE
M3		Модуль социально-политических компетенций																				
1.1.6.	23-0-B-OK-Sotz	Социология	240	8	4		240	5	10		8	37				2						СГДиФВ
	23-0-B-OK-Kul	Культурология			3			5	10		8	37			2							СГДиФВ
	23-0-B-OK-Pol	Политология			6			5	10		8	37						2				СГДиФВ
	23-0-B-OK-Psi	Психология			5			5	10		8	37					2					СГДиФВ
M4		Модуль информационных технологий и искусственного интеллекта																				
1.1.7.	23-0-B-OK-IKT	Информационно-коммуникационные технологии	150	5	3		150	20	20		8	102			5							ИКТ
1.2.	Компонент по выбору:		150	5	1		150	20	20	0	8	102	0	0	0	0	5	0	0	0	0	
M5		Модуль экономическо-управленческих компетенций																				
1.2.1.	25-0-B-KV-EAPD	Экологические аспекты проектирования дорог	150	5	5		150	20	20		8	102					5					АТСиБЖД
	25-0-B-KV-ZEUP	Зеленая экономика и устойчивое предпринимательство																				ТУиБ
	24-0-B-KV-OFG	Основы финансовой грамотности																				ТУиБ
	25-0-B-KV-CI	Цифровая инклюзия																				ИКТ
	23-0-B-KV-OPAK	Основы права и антикоррупционной культуры																				СГДиФВ
	ВСЕГО по циклу ООД:		1680	56	22		1680	100	460	0	176	944	6	6	13	13	11	7	0	0	0	
2.		ЦИКЛ БАЗОВЫХ И ПРОФИЛИРУЮЩИХ ДИСЦИПЛИН (БД, ПД):																				
2.1.		БАЗОВЫЕ ДИСЦИПЛИНЫ (БД):																				
2.1.1.	Вузовский компонент:		1560	52	12		1560	100	200	40	165	995	14	18	8	4	0	3	0	5	0	
M6		Модуль естественно-научных компетенций																				
2.1.1.1.	24-0-B-VK-IM1	Инженерная математика 1	150	5	1		150	10	20		15	105	5									ОИ
2.1.1.2.	24-0-B-VK-IM2	Инженерная математика 2	150	5	2		150	10	20		15	105		5								ОИ
2.1.1.3.	25-0-B-VK-SF	Строительная физика	150	5	1		150	10	10	10	15	105	5									ОИ
2.1.1.4.	25-0-B-VK-SKh	Строительная химия	120	4	2		120	10	10	10	15	75		4								ОИ
M7		Профессиональный модуль																				
2.1.1.5.	25-0-B-VK-Igeod	Инженерная геодезия	180	6	3		180	10	20	10	15	125			6							ТС
2.1.1.6.	25-0-B-VK-StrMatT	Строительные материалы и технологии	180	6	2		180	20	10	10	15	126		6								АСИ
2.1.1.7.	25-0-B-VK-SK	Строительные конструкции	120	4	4		120	10	20		15	75				4						АСИ
2.1.1.8.	25-0-B-VK-OTBZhd	Охрана труда и безопасность жизнедеятельности	150	5	8		150	10	20		15	105								5		АТСиБЖД
M4		Модуль информационных технологий и искусственного интеллекта																				
2.1.1.9.	25-0-B-VK-IGKM	Инженерная графика и компьютерное моделирование	120	4	1		120	10	20		15	75	4									ТС
2.1.1.10.	25-0-B-VK-OPP	Основы программирования Python	90	3	2		90		10		15	65		3								ИКТ
M8		Практикоориентированный модуль																				
2.1.1.11.	25-0-B-VK-POIYa	Профессионально-ориентированный иностранный язык	90	3	6		90		40		15	35						3				LE
2.1.1.12.	23-0-B-VK-UPr(g)	Учебная практика *(геодезическая)*	60	2	3		60								2							TC
2.1.2.	Компонент по выбору:		930	31	7		930	70	100	30	105	625	4	5	5	5	5	3	4	0	0	
M6		Модуль естественно-научных компетенций																				
2.1.2.1.	25-0-B-VK/KV-TMeh	Теоретическая механика	120	4	1		120	10	20		15	75	4									TC
	25-0-B-KV-OKMeh	Основы классической механики																				
2.1.2.2.	25-0-B-KV-SMat	Сопротивление материалов	150	5	2		150	10	10	10	15	105		5								TC
	25-0-B-KV-PMeh	Прикладная механика																				
2.1.2.3.	25-0-B-KV-SMeh	Строительная механика	150	5	3		150	10	20		15	105			5							TC
	25-0-B-KV-MPS	Механика прочности сооружений																				
M7		Профессиональный модуль																				
2.1.2.4.	25-0-B-KV-GMG	Геология и механика грунтов	150	5	4		150	10	10	10	15	105				5						АСИ
	25-0-B-KV-GISG	Геоинформационные системы в геологии																				
2.1.2.5.	25-0-B-KV-OF	Основания и фундаменты	150	5	5		150	10	20		15	105					5					АСИ
	25-0-B-KV-GFs	Геотехника в фундаментостроении																				
2.1.2.6.	25-0-B-KV-GGG	Гидравлика, гидрология, гидрометрия	120	4	7		120	10	10	10	15	75						4				АСИ
	25-0-B-KV-GtRI	Гидротехнические расчеты и измерения																				

М9	Модуль экономическо-управленческих компетенций																										
2.1.2.7.	23-0-B-KV-UE	Управленческая экономика	90	3	6		90	10	10		15	55						3				ТУиБ
	23-0-B-KV-TM	Тайм-менеджмент																				
	ИТОГО по БД:		2490	83	19	0	2490	170	300	70	270	1620	18	23	13	9	5	6	4	5	0	
2.2.	ПРОФИЛИРУЮЩИЕ ДИСЦИПЛИНЫ (ПД):																					
2.2.1.	Вузовский компонент:		1680	56	11		1680	100	180	0	135	965	0	0	0	5	10	15	10	6	10	
М7	Профессиональный модуль																					
2.2.1.1.	25-B-VK-OPiPGD	Основы проектирования и планирования городских дорог	180	6	4		180	10	20		15	135				5						АСИ
2.2.1.2.	25-B-VK-ITRiRGAD	Инновационные технологии реконструкции и ремонта городских автомобильных дорог	150	5	6		150	10	20		15	105						5				АСИ
2.2.1.3.	25-B-VK-ISKG	Инженерные сети и коммуникации в городах	150	5	5		150	10	20		15	105					5					АСИ
М8	Практикоориентированный модуль																					
2.2.1.4.	25-B-VK-INTDS	Инновационные технологии в дорожном строительстве	150	5	5		150	10	20		15	105					5					АСИ
2.2.1.5.	25-B-VK-BGDS	Водоотведение в городской дорожной сети	150	5	6		150	10	20		15	105						5				АСИ
2.2.1.6.	25-B-EOGD	Эксплуатация и обслуживание городских дорог	150	5	7		150	10	20		15	105							5			АСИ
2.2.1.7.	25-B-VK-IOGDiU	Инженерное оборудование городских дорог и улиц	150	5	7		150	10	20		15	105							5			АСИ
2.2.1.8.	25-B-VK-TcTSMiUT	Цифровые технологии в системе мониторинга и управления трафиком	150	5	8		150	20	20		15	95								6		АСИ
2.2.1.9.	25-B-VK-GDUBV	Городские дороги: элементы и их воздействие на безопасность	150	5	9		150	10	20		15	105									5	АСИ
2.2.1.10.	25-0-B-VK-PPr1	Производственная практика 1	150	5	6		150											5				АСИ
2.2.1.11.	25-0-B-VK-PPr2/PdPr	Производственная практика 2/ Преддипломная практика	150	5	9		150														5	АСИ
2.2.2.	Компонент по выбору:		1110	37	9		1110	110	140	0	135	725	0	0	0	0	0	0	12	16	9	
М4	Модуль информационных технологий и искусственного интеллекта																					
2.2.2.1.	25-B-KV-TcTSUD	Цифровые технологии системы управления движением	120	4	7		120	10	20		15	75							4			АСИ
	25-B-KV-SAUD UDS	Системы автоматизированного управление движения на (УДС) улично-дорожной сети																				
М7	Профессиональный модуль																					
2.2.2.2.	25-B-KV-PiNPiMiT	Подземные и надземные пути: инновации в мостостроении и тоннелировании"	120	4	8		120	10	20		15	75								4		ТС
	25-B-KV-ISAD.	Искусственные сооружения на дорогах																				
2.2.2.3.	25-B-KV-AMSGD	Автоматизация и механизация в строительстве городских дорог	120	4	8		120	20	10		15	75								4		АТСиБЖД
	25-B-KV-DSMiO	Дорожно-строительные машины и оборудования																				
М8	Практикоориентированный модуль																					
2.2.2.4.	25-B-KV-OPSGDU	Организация и планирование строительства городских дорог и улиц	150	5	7		150	10	20		15	105							5			АСИ
	25-0-B-KV-OSP	Организация строительного производства																				
2.2.2.5.	25-B-KV-BIGI	Безопасность и инновации в городской инфраструктуре	150	5	8		150	10	20		15	105								5		АСИ
	25-B-KV-PMUP DTP	Предупреждение и меры устранения причин ДТП																				АСИ
2.2.2.6.	25-B-KV-KKDSR	Контроль качества дорожно-строительных работ	180	6	9		180	20	20		15	125									6	АСИ
	25-B-KV-KKDA	Контроль качества дорожных активов																				
М10	Модуль инфраструктурных программ / Модуль дополнительной образовательной программы																					
2.2.2.7.	25-0-B-KV-TIMAS	Технология информационного моделирования в инженерии и инженерном деле	90	3	7		90	10	10		15	55						3				АСИ
	24-0-B-KV-MN1	Минорная программа 1																				АСИ
2.2.2.8.	25-B-KV-NTDADS	Нормативно-техническая документация в инженерии и инженерном деле	90	3	8		90	10	10		15	55							3			АСИ
	24-0-B-KV-MN2	Минорная программа 2																				АСИ
2.2.2.9.	25-0-B-KV-STcAS	Сметное ценообразование в инженерии и инженерном деле	90	3	9		90	10	10		15	55								3		АСИ
	24-0-B-KV-MN3	Минорная программа 3																				АСИ
	ИТОГО по ПД:		2790	93	20	0	2790	210	320	0	270	1690	0	0	0	5	10	15	22	22	19	
	ВСЕГО по циклу БД, ПД:		5280	176	39	0	5280	380	620	70	540	3310	18	23	13	14	15	21	26	27	19	
3.	ДОПОЛНИТЕЛЬНЫЕ ВИДЫ ОБУЧЕНИЯ (ДВО):																					
М11	Модуль личностных компетенций																					
3.1.	24-0-B-KV-DVO-SO	Служение обществу	30	1	1		30		10		5	15	1									АСИ
	25-0-B-KV-DVO-BK	Бизнес коммуникации																				
	ИТОГО ПО ТЕОРЕТИЧЕСКОМУ КУРСУ ОБУЧЕНИЯ (ТКО):		6990	233	62	0	6990	480	1090	70	721	4269	25	29	26	27	26	28	26	27	19	
4.	24-0-B-VK-IA	ИТОГОВАЯ АТТЕСТАЦИЯ	240	8																	8	АСИ
	ИТОГО ЗА ВЕСЬ ПЕРИОД ОБУЧЕНИЯ:		7230	241	62	0	6990	480	1090	70	721	4269	25	29	26	27	26	28	26	27	27	

СОГЛАСОВАНО:

И.о. Проректора по АД _____ Коджабергенова А.К.

РАЗРАБОТАНО:

Директор института ТиС _____ Абдрешов Ш.А.

Заведующий кафедрой АСИ _____ Кулманов К.С.

8. CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAM 6B07183 – Smart Roads: digital technologies in transport structures
Education level: Bachelor's degree Duration of study: 4 years Admission year: 2025

Cycle	Component	Name of the discipline	Total labor intensity		Term	Learning outcome	A brief description of the dissplina	Prerequisites	Post-requirements
			in academic hours	in academic loans					
2	3	4	5	6	7	8	9	10	11
BD	UC	Engineering Mathematics 1	150	5	1	LO2	The discipline "Engineering Mathematics 1" studies the basic concepts of higher mathematics and its applications. The course sections include elements of linear algebra and analytical geometry, an introduction to mathematical analysis, and differential calculus of functions of one and several variables. The purpose of the course is to master the mathematical apparatus for solving theoretical and applied problems of a specific profile, to gain an understanding of mathematical modeling, and to develop analytical and systems thinking, which makes it possible to effectively solve engineering problems. The discipline uses interactive teaching methods and performing computational and graphical work.	Basic school knowledge in mathematics	Construction Physics
BD	UC	Engineering Mathematics 2	150	5	2	LO2	The formation of students' mathematical knowledge and skills necessary for the study of related natural science disciplines, disciplines of the professional cycle and skills of mathematical modeling and research in professional activities. The course sections include integral calculus of functions of one and several variables, ordinary differential equations, and series theory. Special attention is paid to the application of mathematical methods to solve engineering problems.	Basic school knowledge in mathematics	Construction Physics
BD	UC	Building Physics	150	5	1	LO2	Formation of knowledge, skills and competencies necessary for the development, design and operation of energy-efficient, comfortable and durable buildings and structures. Studies the physical processes and phenomena occurring in building structures and buildings, as well as their interaction with the environment, the basics of building and architectural acoustics, building climatology, lighting engineering, thermal engineering.	Basic school knowledge in physics	Construction chemicals

BD	UC	Construction chemicals	120	4	2	LO2	The formation of knowledge in the field of building chemistry is associated with the development of science and technology aimed at improving building materials and their application processes. Construction chemistry studies and develops chemical materials, additives and substances that affect the properties of building structures, ensuring their strength, durability, resistance to external influences and energy efficiency. An important part of the course is studying the environmental impact of building chemicals.	Basic school knowledge of chemistry	Construction materials and technologies Occupational health and safety
BD	UC	Engineering geodesy	180	6	3	LO7	Forms professional competencies that determine the readiness and ability of the bachelor to use basic knowledge in the field of geodesy, allows you to make geodetic measurements related to the solution of typical construction tasks, a detailed layout of structures, to control the geometric shapes of the erected structure, perform executive surveying results of individual stages of construction and installation work, gives skills for the application of basic geodetic instruments for specific production conditions.	Engineering Mathematics 1,2	Building structures Engineering graphics and computer modeling
BD	UC	Building materials and technologies	180	6	2	LO9	The discipline studies the properties, classification and application of various building materials, such as concrete, asphalt concrete, bitumen, brick, metal and wood. It covers modern technologies for their production and processing, as well as methods for assessing quality. Knowledge in this area is necessary for the effective design and construction of facilities.	Construction chemicals	Building structures Occupational safety and health Innovative technologies for reconstruction and repair of urban highways
BD	UC	Building structures	120	4	4	LO4 LO9	The discipline studies the design, analysis and application of various types of structures such as buildings, bridges and transport structures. It covers materials, mechanical properties and strength calculation methods. Knowledge in this area is necessary to create safe and sustainable facilities that meet modern standards and requirements.	Construction chemicals Building materials and technologies	Occupational safety and health Innovative technologies for reconstruction and repair of urban highways

BD	UC	Occupational safety and health	150	5	8	LO9	The discipline studies the direction of students' formation of knowledge and skills necessary to ensure safe working and living conditions. The legal and organizational foundations of occupational safety, methods of occupational risk assessment and management, means of individual and collective protection, emergency prevention, as well as measures to prevent injuries and occupational diseases are studied. Special attention is paid to the creation of a safe working environment, compliance with labor protection standards and requirements, as well as the formation of a safety culture in professional activities.	Construction chemicals Engineering geodesy Building materials and technologies	Innovative technologies for reconstruction and repair of urban highways Engineering networks and communications in cities Urban roads: elements and their impact on safety
BD	UC	Engineering graphics and computer modeling	120	4	1	LO3 LO9	The course covers the principles of technical drawing and engineering graphics, as well as modern 3D modeling methods using specialized software, aimed at developing skills in designing and visualizing technical objects, creating digital models and diagrams, drafting, modeling structures, and analyzing their parameters for solving engineering problems.	Engineering geodesy Building structures	Fundamentals of urban road design and planning Innovative technologies for reconstruction and repair of urban highways Engineering networks and communications in cities Digital technologies in the traffic monitoring and management system

BD	UC	Python programming basics	90	3	2	LO3 LO9	The discipline studies the syntax and semantics of the Python language, algorithmization and program design, program structuring and solving problems related to artificial intelligence, learns machine learning, data processing and intelligent system development methods, and analyzes the use of AI in various fields, forming professional competencies in programming and the basics of artificial intelligence.	Engineering geodesy Building structures	Fundamentals of urban road design and planning Innovative technologies for reconstruction and repair of urban highways Engineering networks and communications in cities Digital technologies in the traffic monitoring and management system
BD	UC	Professionally oriented foreign language	90	3	6	LO8	Formation and development of professional communicative competence in a foreign language necessary for professional activity, proficiency in a professional foreign language for written and oral information exchange, development of skills in reading and understanding professional literature on their specialty in a foreign language, development of the ability to express their thoughts orally and in writing in situations of professional and business communication.	Engineering geodesy Building structures	
PD	UC	Fundamentals of urban road design and planning	180	6	4	LO11	The discipline studies the principles of creating safe, efficient and convenient streets. It covers geometry, traffic management, infrastructure, landscaping and landscaping, taking into account digital inclusion, as well as regulatory requirements and modern approaches to designing a sustainable urban environment.	Engineering geodesy Engineering graphics and computer modeling	Innovative technologies for reconstruction and repair of urban highways Engineering networks and communications in cities Digital technologies in the traffic monitoring and management system

PD	UC	Innovative technologies for reconstruction and repair of urban highways	150	5	6	LO10	The discipline studies modern methods and technologies for reconstruction and repair of city streets, including innovative materials, equipment and approaches. The issues of sustainable development, increasing the efficiency of work, reducing costs and environmental impact, as well as digitalization of processes and management of urban infrastructure are considered. .	Building materials and technologies Building structures Occupational safety and health	Innovative technologies in road construction Engineering networks and communications in cities Drainage in the urban road network
PD	UC	Engineering networks and communications in cities	150	5	5	LO9	The discipline is aimed at developing in students a comprehensive understanding of engineering systems, their interrelations and impact on urban infrastructure, as well as developing skills in the design and analysis of engineering solutions for sustainable urban development, such as water supply, sanitation, electricity supply, gas supply and centralized and decentralized heat supply systems, including boiler houses and heating networks.	Engineering graphics and computer modeling Basics of Python programming Fundamentals of urban road design and layout	Operation and maintenance of urban roads Engineering equipment of urban roads and streets Sanitary conditions on the urban road network
PD	UC	Innovative technologies in road construction	150	5	5	LO10	The course is aimed at studying modern methods and technologies used in the design, construction and operation of road infrastructure, automation of processes using information technologies to optimize design and construction management using BIM technologies, sustainable development, drones and other digital tools for monitoring and managing construction projects, modeling and simulation to optimize design solutions, taking into account people with disabilities.	Fundamentals of urban road design and layout Innovative technologies for reconstruction and repair of urban highways	Sanitation in the urban road network Digital technologies in the traffic monitoring and management system Urban roads: elements and their impact on safety

PD	UC	Sanitation in the urban road network	150	5	6	LO9	The discipline studies methods and technologies for managing rainwater and wastewater in urban environments. It covers the design of wastewater systems, assessment of their efficiency and impact on the environment, as well as issues of sustainable development and minimization of flooding in urban infrastructure.	Engineering graphics and computer modeling Basics of Python Programming Fundamentals of urban road design and planning	Operation and maintenance of urban roads Engineering equipment of urban roads and streets Urban roads: elements and their impact on safety
PD	UC	Operation and maintenance of urban roads	150	5	7	LO10	The discipline covers methods and technologies for maintaining road infrastructure, taking into account digital inclusion and sustainable development. It includes planning, condition monitoring, repairs and prevention, as well as traffic management. The main focus is on ensuring the safety, comfort and durability of roads, which contributes to improving transport accessibility and reducing the negative impact on the environment.	Fundamentals of urban road design and planning Innovative technologies for reconstruction and repair of urban highways	Engineering equipment of urban roads and streets Urban roads: elements and their impact on safety
PD	UC	Engineering equipment of urban roads and streets	150	5	7	LO11	The discipline covers the design, installation, and maintenance of engineering systems such as lighting, sanitation, road markings, and signs. It ensures safety, sustainable development and digital inclusion, comfort and functionality of the transport infrastructure, facilitating efficient movement and improving the quality of the urban environment for residents and visitors.	Engineering graphics and computer modeling Basics of Python Programming Innovative technologies for reconstruction and repair of urban highways	Digital technologies in the Urban Roads traffic monitoring and management system: elements and their impact on safety

PD	UC	Digital technologies in the traffic monitoring and management system	150	5	8	LO11	The discipline covers modern methods and tools for optimizing traffic flows. She studies the use of sensors, data analytics and software to improve traffic efficiency, reduce congestion and improve road safety, as well as the implementation of innovative solutions in transport infrastructure.	Engineering graphics and computer modeling Basics of Python Programming Fundamentals of urban road design and planning	Urban roads: elements and their impact on safety
PD	UC	Urban roads: elements and their impact on safety	150	5	9	LO11	The discipline studies the structural elements of road infrastructure and their impact on traffic safety. Factors such as road geometry, signage, lighting and medians are considered. The goal is to develop recommendations to improve safety and reduce accidents on city roads.	Basics of Python Programming Fundamentals of urban road design and planning Digital technologies in the traffic monitoring and management system	Final certification
Total			**5280**	**176**					

9 .CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAM **6B07183 – Smart Roads: digital technologies in transport structures**
Education level: Bachelor's degree **Duration of study: 3 years** **Admission year: 2025**

Cycle	Component	Name of the discipline	Total labor intensity		Term	Results of the study	Brief description of the discipline	Prerequisites	Post-requirements	Department
			in academic hours	in academic credits						
1	2	3	4	5	6	7	8	9	10	11
GED	EC	Environmental aspects of road design	150	5	5	LO8	Environmental aspects of road design involve minimizing harm to the environment: preserving landscapes, reducing emissions, providing noise protection, and safeguarding water resources. It is important to consider biodiversity, material sustainability, and impacts on ecosystems. Eco-friendly design reduces the environmental footprint and supports sustainable development.	History of Kazakhstan, Foreign language,Kazakh (Russian) language, Sociology, Cultural studies	Final certification	MVaLF
GED	EC	Green economy and sustainable entrepreneurship				LO1 LO8	The discipline "Green Economy and Sustainable Entrepreneurship" is devoted to the study of environmentally oriented economic models and business strategies aimed at sustainable development. The course examines the concepts of the green economy, ESG (Environmental, Social, Governance) approaches, circular economy, sustainable business models and their impact on global markets	Building materials and technologies, ,Geology and mechanics of soils, Geoinformation systems in geology	Occupational safety and health, g, Innovative technologies in road construction,Highways and airfields	TSaB
GED	EC	Fundamentals of financial literacy				LO1 LO8	The discipline is aimed at developing the ability to make informed financial decisions, plan income and expenditures, assess risks and effectively manage their resources in a market economy. It studies the basic knowledge in the sphere of finance and rational management of monetary resources, the concepts of financial system, budget, banking products, crediting, savings, investments, insurance, taxation and protection against financial fraud are considered.	Engineering Mathematics 1,2, Building materials and technologies,Building structures,	Final certification	TSaB
GED	EC	Digital inclusion				LO1 LO8	The discipline "Digital Inclusion" is devoted to the study of the principles of ensuring equal access to digital technologies and information for all social groups, including people with disabilities. The course examines barriers to digital inequality, strategies for overcoming them, technologies for adapting the digital environment, and government initiatives to develop an inclusive digital society.	Building materials and technologies,Building structures, Geoinformation systems in geology,Geology and	Operation and maintenance of urban roads, Innovative technologies in road construction, Underground and aboveground tracks: innovations in bridge construction and	IaCT

								mechanics of soils,Information and communication technologies	tunneling, Artificial structures on roads, Computer-aided design of highways	
GED	EC	Basics of law and anti-corruption culture				LO8	The discipline outlines the fundamental concepts of law, the constitutional structure of the state power of the Republic of Kazakhstan, the rights and freedoms of citizens enshrined in the Constitution, the mechanism and protection of legitimate human interests in case of their violation. The discipline forms students' improvement of public and individual legal awareness and legal culture, as well as a system of knowledge and citizenship on combating corruption as an antisocial phenomenon.	History of Kazakhstan, Foreign language,Kazakh (Russian) language, Sociology, Cultural studies	Final certification	SaHDaPE
BD	EC	Theoretical mechanics	120	4	1	LO2 LO9	Formation of scientific engineering thinking. To familiarize with the basic concepts, laws and theorems that make it possible to compose equations describing the behavior of mechanical systems, the ability to record a specific phenomenon in mathematical form, the use of basic methods of mechanics in the study of motion and equilibrium of mechanical systems in the study of disciplines of the professional cycle.	Engineering Mathematics 1,2, Construction Physics	Geology and mechanics of soils, foundations and foundations, Underground and aboveground paths: innovations in bridge construction and tunneling, Artificial structures on roads	TC
BD	EC	Fundamentals of classical mechanics				LO2 LO9	The discipline aims to develop skills in solving problems and the ability to analyze and solve tasks in the field of statics and dynamics of rigid bodies and oscillatory motion, studying the main mathematical models used in theoretical mechanics, kinematic characteristics of the motion of material points and systems, solving statics problems using equilibrium conditions of force systems, and dynamics based on Newton's second law with the application of fundamental theorems of dynamics.	Engineering Mathematics 1,2,Construction Physics	Resistance of materials, Applied mechanics, Structural mechanics,Mechanics of structural strength	TC
BD	EC	Resistance of materials	150	5	2	LO2 LO9	Formation of fundamental knowledge in the field of calculations of structural elements for strength, stiffness and stability, mastering the calculation and experimental foundations and practical methods of calculation of structures under the condition of reliability, durability, efficiency, considering the mechanical properties of structural materials and the ability to design by strength criteria correctly evaluating the limiting state, conducting verification and design calculations, using modern educational and information technology.	Fundamentals of Classical Mechanics, Theoretical Mechanics	Construction mechanics, Mechanics of structural strength, Geology and mechanics of soils, foundations and foundations, Geoinformation systems in geology, Underground and aboveground paths: innovations in bridge construction and	TC

									tunneling, Artificial structures on roads	
	EC	Applied mechanics				LO2 LO9	This discipline develops practical skills in applying the laws of theoretical mechanics and strength of materials to calculate the strength, stiffness, and stability of machine elements and engineering structures, as well as to analyze their motion and interaction under various types of loads, with the aim of further designing reliable and efficient technical systems.	Theoretical mechanics, Fundamentals of classical mechanics	Construction mechanics,Mechanics of structural strength, Geology and mechanics of soils, Foundations and foundations,	TC
	EC	Construction mechanics	150	5	3	LO2 LO9	Formation of skills in designing standard structures related to the choice of a design scheme, determining the most loaded structural elements and calculating internal forces and stresses. Studies methods for calculating forces in statically definable and indeterminate rod systems under the action of constant and temporary loads, determining displacement in rod systems to ensure the strength and reliability of structures in combination with high efficiency.	Fundamentals of classical Mechanics, Theoretical mechanics,Resistance of matrices, Applied Mechanics,	Geology and mechanics of soils, foundations and foundations, Geoinformation systems in geology, Underground and aboveground paths: innovations in bridge construction and tunneling, Artificial structures on roads	TC
	EC	Mechanics of structural strength				LO2	Formation of skills in the field of work analysis and calculation of structures made of various materials under various influences using modern computing equipment. Studies the features of the laws of stress and strain distribution in structural elements under various conditions of external load, principles and methods of static and dynamic calculation of engineering structures for strength, rigidity, stability.	Engineering graphics in computer modeling, fundamentals of Pylton programming.Engineering geodesy, Theoretical mechanics, Resistance of materials,Structural mechanics, Mechanics of structural strength	Geology and mechanics of soils, Foundations and foundations, Operation and maintenance of urban roads, Innovative technologies in road construction,Highways and airfields, Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	TC
BD	EC	Geology and Soil Mechanics	150	5	4	LO5	The discipline is aimed at developing professional competencies in the field of engineering geology and soil mechanics to solve practical problems in assessing and analyzing the engineering and geological conditions of the construction of city streets and road infrastructure.	Information and communication technologies,Engineering Mathematics 1,2,Construction physics,Constru	Operation and maintenance of urban roads, Innovative technologies in road construction,Highways and airfields, Operation of highways,	AaCE

								ction chemistry,Engineering Geodesy, Theoretical mechanics,Resistance of materials,Construction mechanics, Mechanics of structural strength	Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	
BD	EC	Geoinformation systems in geology				LO5	The discipline teaches the skills of engineering and geodetic calculations and methods of working with modern geodetic instruments to carry out marking work on the ground, control the production and quality of work performed at each stage of the construction process, and monitor geological and hydrogeological processes.	Engineering geodesy, Building materials and technologies,Building structures, Kinetic mechanics,Resistance of materials, Structural mechanics, Hydraulics, hydrology,hydrometry, Geoinformation systems in geology	Hydraulics,hydrology, hydrometry, Operation and maintenance of urban roads, Innovative technologies in road construction,Highways and airfields, Operation of highways, Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads, Computer-aided design of highways	AaCE
BD	EC	Foundations and bases	150	5	5	LO5	Formation of knowledge about the basic laws of soil behavior under load, the theory of stress-strain state and their interaction with structures. Studies the main methods for determining the sediment of foundations, the stability of slopes and slopes, as well as the morphology, dynamics and regional features of the upper horizons of the Earth's crust (lithosphere) and their relationship with engineering structures	Engineering Graphics in Computer modeling, Fundamentals of Pylton programming.Engineering geodesy, Building materials and technologies,Building structures, Theoretical mechanics, Resistance of materials,Const	Operation and maintenance of urban roads, Innovative technologies in road construction,Highways and airfields, Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE

								ruction mechanics		
BD	EC	Geotechnics in foundation engineering				LO5	The discipline considers the formation and development of areas of plastic deformation in a homogeneous base of a buried flexible strip foundation when it is loaded within the framework of a model of a mixed problem of the theory of elasticity and the theory of soil plasticity.	Foundations and foundations, Engineering geodesy, Building materials and technologies,Building structures,	Fundamentals of highway design, Urban roads: elements and their impact on safety, Operation and maintenance of urban roads, Innovative technologies in road construction, Underground and aboveground paths: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
BD	EC	Hydraulics, hydrology, hydrometry	120	4	7	LO5	The course of the discipline "Hydraulics, hydrology, hydrometry" includes the study of the movement and equilibrium of liquids, the laws and characteristics of their manifestation, water processes and modes of water flows, methods for determining water parameters. The theoretical set of knowledge is applicable in the design of transport structures, as well as in hydraulic engineering construction.	Foundations and foundations, Geotechnics in foundation engineering,Engineering geodesy, Building materials and technologies,Building structures,	Fundamentals of highway design, Urban roads: elements and their impact on safety, Operation and maintenance of urban roads, Innovative technologies in road construction, Underground and aboveground paths: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
BD	EC	Hydrotechnical calculations and measurements				LO5	The discipline "Hydraulic calculations and measurements" studies methods for calculating water flow rates, head, filtration and stability of culverts in the design of transport structures. The course covers methods for measuring hydrological characteristics, analysis of field studies, modeling of processes in river beds, calculation of culverts and protective structures.	Foundations and foundations,, Geotechnics in foundation engineering,Engineering geodesy, Building materials and technologies,Building structures,	Fundamentals of highway design, Urban roads: elements and their impact on safety, Operation and maintenance of urban roads, Innovative technologies in road construction, Underground and aboveground paths: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
BD	EC	Managerial Economics	90	3	6	LO1 LO8	Formation of the conceptual apparatus and development of skills of economic analysis using modern models and patterns of economic science, consideration of economic	Fundamentals of Financial literacy,	Final certification	TSaB

							problems and challenges facing the head of the firm. The study of this discipline will allow students to obtain and develop knowledge in the field of analytical research of economic, technological and technical parameters of the enterprise, as well as allow you to master the skills of using special methods of economic justification of management decisions and assessment of their consequences.	Fundamentals of Law and anti-corruption culture		
BD	EC	Time -management				LO1 LO8	The discipline studies a system of methods, tools and approaches that are aimed at effective time management in order to achieve set goals. The course is designed to improve skills in organizing and optimizing the use of working time, increasing productivity, reducing stress, planning, delegation, using tools and technologies, as well as knowing your time and energy rhythms in order to use your time effectively.	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and anti-corruption culture	Final certification	TSaB
PD	EC	Digital technologies of the motion control system	120	4	7	LO11	The discipline studies modern methods and tools for optimizing traffic flows in cities. It covers the use of sensors, data processing algorithms and software to monitor, analyze and manage traffic to improve the safety and efficiency of transport infrastructure.	Fundamentals of urban road design, Urban Roads: elements and their impact on safety, Operation and Maintenance of urban roads	Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
PD	EC	Automated traffic control systems on the road network				LO9	The discipline studies technologies and methods that ensure effective management of traffic flows. The systems of monitoring, regulation and optimization of traffic are considered, as well as their impact on the safety and comfort of road traffic in cities. Focus on innovative solutions and integration of digital technologies.	Fundamentals of urban road design, Urban Roads: elements and their impact on safety, Operation and Maintenance of urban roads	Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
PD	EC	Underground and aboveground tracks: innovations in bridge construction and tunneling	120	4	8	LO12	The discipline studies modern technologies and innovations in bridge construction and tunneling. It covers the design, construction and operation of infrastructure facilities, analyzing their impact on the safety and sustainability of transport systems. Particular attention is paid to modern materials, methods and environmental aspects that contribute to the efficient development of urban infrastructure.	Occupational safety and health, Engineering geodesy, Building materials and technologies	Quality control of road construction works Quality control of road assets Information modeling technology in engineering and engineering	TC
PD	EC	Artificial structures on roads				LO12	The discipline studies bridges, tunnels, overpasses, retaining walls, and other structures used to organize traffic. the principles of designing transport interchanges, including circular, multi-level and other types that	Geology and mechanics of soils, Foundations	Safety and innovation in urban infrastructure, Quality control of road construction works	TC

							minimize congestion and increase safety. the study of modern materials and technologies used in the construction of artificial structures, as well as their impact on the durability and safety of structures.	and foundations, Operation and maintenance of urban roads, Innovative technologies in road construction, Highways and airfields	Quality control of road assets	
PD	EC	Automation and mechanization in urban road construction	120	4	8	LO12	The discipline develops students' skills necessary for the design, operation and maintenance of machines and mechanisms, which is important for a successful career in the field of automotive and road construction. Studies various types of machines such as excavators, bulldozers, graders and pavers, as well as their purpose and scope of application.	Fundamentals of urban road design, Urban Roads: elements and their impact on safety, Operation and Maintenance of urban roads	Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	MVaLF
PD	EC	Road construction machinery and equipment				LO12	The discipline studies the structures, principles of operation and application of machinery used in road construction. It includes excavators, bulldozers, rollers and pavers. Students master the technologies of operation, maintenance and repair, as well as methods to improve the efficiency and safety of work on construction sites.	Occupational safety and health, Engineering geodesy, Building materials and technologies	Quality control of road construction works Quality control of road assets Organization and planning of urban roads and streets construction	MVaLF
PD	EC	Organization and planning of urban roads and streets construction	150	5	7	LO11	The discipline covers methods and approaches to the effective design, coordination and management of construction processes. It includes requirements analysis, schedule development, resource allocation and quality control, which contributes to the creation of safe and functional urban transport infrastructure.	Operation and maintenance of urban roads, Innovative technologies in road construction,	Safety and innovation in urban infrastructure, Quality control of road construction works Quality control of road assets	AaCE
PD	EC	Organization of construction production				LO11	The formation of students' professional skills on the basic principles and methods of organizing road works, organizational and technical training and calendar planning of road works, as well as gaining knowledge in the field of production and economic activities of enterprises when choosing rational options for organizational and planning solutions that ensure increased economic efficiency of production. Studies the principles and methods of project management, time control and planning, and resource allocation.	Operation and maintenance of urban roads, Innovative technologies in road construction,	Quality control of road construction works Quality control of road assets Security and innovation in urban infrastructure	AaCE
PD	EC	Security and innovation in urban infrastructure	150	5	8	LO10	The discipline studies modern approaches to ensuring security in urban systems. Innovative technologies, design and management methods aimed at reducing risks	Digital technologies of	Quality control of road construction works	AaCE

							and improving the quality of life are considered. The emphasis is on sustainable development and the integration of new solutions into existing infrastructure.	the motion control system Automation and mechanization in the construction of urban roads Automated traffic control systems on the road network	Quality control of road assets	
PD	EC	Prevention and measures to eliminate the causes of accidents				LO10	The discipline examines the factors that contribute to road traffic accidents and develops methods to prevent them. Includes analysis of accident statistics, risk assessment, introduction of innovative technologies and educational programs to improve road safety. The goal is to reduce the number of accidents and improve road infrastructure.	Digital technologies of the motion control system Automation and mechanization in the construction of urban roads Automated traffic control systems on the road network	Quality control of road construction works Quality control of road assets	AaCE
PD	EC	Quality control of road construction works	180	6	9	LO10	The purpose of the discipline is to study quality control methods at various stages of road construction work. The course examines the principles of monitoring the compliance of construction processes and materials with regulatory requirements and standards, as well as methods for diagnosing and monitoring the condition of road construction facilities.	Quality control of road construction works,Ensuring the life cycle of roads, Bridges and tunnels on highways, Artificial structures on highways	Final certification	AaCE
PD	EC	Quality control of road assets				LO10	The purpose of the discipline is to develop students' knowledge and skills in the field of assessment, monitoring and quality assurance of road assets, including methods of monitoring, diagnosing and managing their condition to improve safety, operational efficiency and prolong the service life of road infrastructure.	Quality control of road construction works, Ensuring the life cycle of roads, Bridges and tunnels on highways, Artificial structures on highways	Final certification	AaCE
PD	EC	Information modeling technology in	90	3	7	LO10	The discipline studies methods of creating, managing and using digital models of construction objects that combine architectural, structural, engineering and operational	Operation and maintenance of urban roads,	Final certification	AaCE

		engineering and engineering					data. Digital design is the development of intelligent 3D models with parameter binding. The purpose of the discipline. Ensuring design accuracy, reducing errors and costs, improving the quality of construction and operation of infrastructure through digital technologies.	Innovative technologies in road construction, Highways and airfields		
PD	EC	Minor program 1				LO4	he first of the three disciplines, which allows you to form additional professional competencies in various subject areas.	Engineering graphics and computer modeling, Fundamentals of Pylton programming	Regulatory and technical documentation in engineering and engineering	AaCE
PD	EC	Regulatory and technical documentation in engineering and engineering	90	3	8	LO4	Studies the principles of application and compliance with standards, norms and technical documentation (GOST, ISO, SNiP, JV RK, CH RK, etc.) in engineering practice. The main focus is on the correct design of technical documents, drawings, instructions and compliance of projects with regulatory requirements.	Fundamentals of Urban Road Design, Highway Survey and Design, Urban Road Operation and Maintenance	Underground and aboveground tracks: innovations in bridge construction and tunneling, Artificial structures on roads	AaCE
PD	EC	Minor program 2				LO6	The second of the three disciplines, which allows you to form additional professional competencies in various subject areas..	Fundamentals of urban road design, Urban Roads: elements and their impact on safety, Operation and Maintenance of urban roads	Final certification	AaCE
PD	EC	Estimated pricing in engineering and engineering	90	3	9	LO6	The discipline studies the methods of making estimates, calculating the cost of engineering projects, as well as the principles of determining the cost of materials, equipment, labor and other aspects of project implementation. The main focus is on regulatory frameworks (for example, GESN, FER, TSN), market analysis and cost optimization during design and construction in ABC programs, etc.	Organization and planning of urban roads and streets construction	Final certification	AaCE
PD	EC	Minor program 3				LO6	The third of the three disciplines, which allows you to form additional professional competencies in various subject areas.	Fundamentals of financial literacy	Final certification	AaCE
			2190	**73**						

10. EXPERT OPINIONS
on the educational program 6B07183 - Smart Roads: Digital Technologies in Transport Facilities

The implementation of the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" is carried out through the sequence of studied disciplines, with the establishment of specific tasks and target indicators. There is a clear interdisciplinary interaction, which consists in the complex connection between the content of individual academic disciplines, through which the internal unity of the training program for specialists is achieved.

The curriculum of the educational program defines the list of all mandatory and elective academic disciplines, the workload of each academic discipline in credits, the sequence of their study, the types of academic activities, and the forms of control. It is relevant to study the environmental situation and ensure safe working conditions at the enterprises of Saulet-SKB LLP.

The purpose of the educational program is relevant, formulated quite concisely, and combines the learning outcomes. The description of the disciplines reflects their goals and content as an indicator of achieving the learning outcomes for this educational program. Additionally, the educational program, developed based on the professional standard, includes the main job functions in the competencies and learning outcomes, as well as the types of connections with employers, such as guest lectures, lectures by top managers, and the presence of departmental branches at organizations.

Thus, the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" in the field of training "6B071-Engineering and Engineering Science" submitted for expert review fully complies with the requirements of the State Educational Standard, has a clear sequence of development, meets the current demands of the labor market, professional standards, and can be implemented for training personnel in the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" in the field of training.

Expert
Director of Saulet-SKB LLP A.E. Oshanov

10. EXPERT OPINIONS
on the educational program 6B07183 - Smart Roads: Digital Technologies in Transport Facilities

The implementation of the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" is carried out through the sequence of studied disciplines, with the establishment of specific tasks and target indicators. There is a clear interdisciplinary interaction, which consists in the complex connection between the content of individual academic disciplines, through which the internal unity of the training program for specialists is achieved.

The curriculum of the educational program defines the list of all mandatory and elective academic disciplines, the workload of each academic discipline in credits, the sequence of their study, the types of academic activities, and the forms of control. It is relevant to study the environmental situation and ensure safe working conditions at the enterprises of Saulet-SKB LLP.

The purpose of the educational program is relevant, formulated quite concisely, and combines the learning outcomes. The description of the disciplines reflects their goals and content as an indicator of achieving the learning outcomes for this educational program. Additionally, the educational program, developed based on the professional standard, includes the main job functions in the competencies and learning outcomes, as well as the types of connections with employers, such as guest lectures, lectures by top managers, and the presence of departmental branches at organizations.

Thus, the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" in the field of training "6B071-Engineering and Engineering Science" submitted for expert review fully complies with the requirements of the State Educational Standard, has a clear sequence of development, meets the current demands of the labor market, professional standards, and can be implemented for training personnel in the educational program "6B07183 - Smart Roads: Digital Technologies in Transport Facilities" in the field of training.

Expert
Chief Engineer
Kazakh Promtransproject LLP **Musaev M.T.**

Review

of the educational program
in the field of training "6B07183 - Smart Roads: digital technologies in transport facilities"

The Bachelor's degree program "6B07183 - Smart Roads: Digital technologies in transport facilities" contains the following information: graduate's qualifications, form and duration of study, direction and characteristics of graduate activities, a complete list of competencies that a graduate should possess as a result of mastering this educational program.

The disciplines of the curriculum according to the reviewed educational program form the entire necessary list of general cultural and professional competencies provided by the State Educational Standard for the relevant types of activities.

The curriculum of the educational program defines a list of all academic disciplines of the mandatory component and the elective component, the complexity of each academic discipline in credits, the sequence of their study, types of training sessions and forms of control. The catalog of elective subjects and the Catalog of the intra-university component fully reflect the continuity of the disciplines Underground and aboveground tracks: innovations in bridge construction and tunneling; Automation and mechanization in urban road construction; Safety and innovation in urban infrastructure; Quality control of road construction works.

The sequence of studying the disciplines has been observed, and the disciplines necessary for production and the technological process have been included.

The content of the work programs of academic disciplines and practices allows us to conclude that it corresponds to the competence of the graduate model.

The educational program provides for professional and practical training of students in the form of practice. The content of the internship programs testifies to their ability to form the practical skills of students.

Experienced teaching staff, leading representatives of the employer, and students were involved in the development of the educational program, and their requirements were taken into account when forming professional cycle disciplines.

Conclusion:

In general, the reviewed educational program meets the basic requirements of the State Educational Standard, the national qualifications framework, the industry qualifications framework, professional standards, the Atlas of New Professions and contributes to the formation of general cultural

and professional competencies in the field of training "6B07183 - Smart Roads: digital technologies in transport facilities".

The reviewer
Assoc.Professor of the department of "TSiU"
KazADI named after L.Goncharov

Abiev B.A.

12. LETTERS OF RECOMMENDATION

Dear Meruert Sovetovna

The management of KazdorNII JSC, represented by Yerembayev O.M. got acquainted with the content of the educational program "6B07183 - Smart Roads: digital technologies in transport facilities" and made the following recommendations:

- to include the following disciplines in the content of the educational program: roads,
- to increase the number of hours allocated for conducting part of laboratory and practical classes at employers' bases in order to form certain types of professional competencies;
- to update the content of educational programs by including in the cycle of basic and profile modules disciplines reflecting modern innovative technologies in the transport and communication sphere. It is proposed to include the following disciplines: Underground and aboveground tracks: innovations in bridge construction and tunneling; Automation and mechanization in urban road construction; Safety and innovation in urban infrastructure; Quality control of road construction works.
- increase the number of hours allocated for conducting production practices;

enable disciplines:

- Underground and aboveground tracks: innovations in bridge construction and tunneling";
- Automation and mechanization in the construction of urban roads;
- Safety and innovation in urban infrastructure;
- Quality control of road construction works.

Director of the Almaty branch of KazdorNII JSC ФИЛИАЛ ҚАЗЖОЛҒЗИ КАЗДОРНИИ **Yerembaev O.M.**

13. PROTOCOLS OF REVIEW AND APPROVAL

Academy of Logistics and Transport

PROTOCOL No. 7

Meetings

Des akademischen Ausschusses für das Bildungsprogramm und der führenden Lehrer des Lehrstuhls "Architektonisch-Bauingenieurwesen»

city of Almaty **"18"02. 2025 year**

Chairman:Kulmanov K.S.

Secretary: Begezhanova G.S.

Attended by: Head of the Department of "ASI" Ph.D., Assoc.Professor Kulmanov K.S., Candidate of Technical Sciences, associate professors: Bondar I.S.,Espayeva G.A., Tursumbekova H.S., Candidate of Technical Sciences, assistant. professors; Dyusengalieva T.M., Uteshbaeva A.A., Dzhaksenbaev E.K., Murzalina G.B., Dzhumagaliev T.K., senior lecturers; Zhigitbaeva B.E., Suleimenov I.T., Kalpenova Z.D., Karimova M.B.

Representatives from the production: Apple Build Project LLP, Chief engineer Kurmanbekov Zh.K., Director of the Almaty branch of KazdorNII Yerembaev U.M., Saulet-SKB LLP, Director Oshanov A.E., Kazakh Promtransproekt LLP, Chief engineer Musaev M.T.

AGENDA:

1. Consideration of the graduate's competence model
2. Consideration of the possibility of including disciplines in QED and RUP

On the first question

MADE A SPEECH:

The head of the department, K.S. Kulmanov, proposed to consider the graduate's competence model at 3 levels of education: bachelor's degree, master's degree, doctoral degree.

The graduate's competence model includes the following parts:

- The purpose and objectives of the educational program;
- Learning outcomes;
- Area, objects, types and functions of professional activity;
- The list of positions in the educational program;
- Professional certificates obtained upon graduation;
- Requirements for the previous level of education.

PERFORMED:

Representative of employers: Yerembaev O.M. who proposed, due to the specifics of their organization, to reflect the following in the objects of professional activity: Modern innovative technologies in the transport and communication sphere

THE SPEAKER was:

Member of the department Tursumbekova H.S. who proposed to approve

After reviewing the graduate's competence model, it was proposed to approve this Model for 3 levels of education.

THEY DECIDED:

- provide a graduate's competence model for 3 levels of education: Bachelor's degree, Master's degree, doctoral degree for consideration and approval by the Council of the Institute of Transport and Construction.

On the second question

MADE BY: Head of the department K.S. Kulmanov with a proposal to hear representatives of employers and trainees on the inclusion of new disciplines in the CAD and RUP of admission in 2025.

MADE BY: representative of employers of «Apple Build Project» LLP, chief engineer Kurmanbekov Zh.K.

Organizations are interested in specialists with a good level of training and knowledge in the field of design and construction of highways. We are making proposals to include the following demanded disciplines in the RUP: Underground and aboveground tracks: innovations in bridge construction and tunneling"; Automation and mechanization in the construction of urban roads; Safety and innovation in urban infrastructure; Quality control of road construction works.

THEY DECIDED:

1. Take the information into consideration;
2. Take into account the suggestions and recommendations of employers and students;
3. Consider the inclusion in the RUP of the following disciplines: Underground and aboveground tracks: innovations in bridge construction and tunneling"; Automation and mechanization in the construction of urban roads; Safety and innovation in urban infrastructure; Quality control of road construction works.

Chairman: **Kulmanov K.S.**
Secretary: **Begezhanova G.S.**

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
JSC "ALT UNIVERSITY NAMED AFTER MUKHAMEDZHAN TYNYSHPAYEV"
INSTITUTE OF TRANSPORT AND CONSTRUCTION

EXTRACT from the Protocol No. 8
of the extraordinary meeting of the Educational and Methodological Bureau (UMB)
of the Institute of Transport and Construction
in Almaty on March 17, 2025.

Chairman: Abdreshov S.A.
Secretary: Murzalina G.B.
Were present: Abdreshov Sh.A., Apple Build Project LLP, Chief engineer Kurmanbekov Zh.K., Director of the Almaty branch of KazdorNII Yerembaev U.M., Saulet-SKB LLP, Director Oshanov A.E., Kazakh Promtransproekt LLP, Chief engineer Musaev M.T., Murzalina G.B.

AGENDA:

1. Discussion of new educational programs for the 2025-26 academic year.

On the issue

WE LISTENED TO: the director of ITiS, Sh.A. Abdreshov, who proposed to consider the following sections of educational programs for admission in 2025: the graduate's competence model and educational program passports, as well as work curricula, catalogs of the university component (CVK) and catalogs of elective disciplines (CED).

PERFORMED:

1) The head of the department, K.S. Kulmanov, who presented for consideration the sections of the new educational program "6B07183 - Smart Roads: Digital technologies in transport facilities" for admission in 2025: the graduate's competence model, the passport of the educational program, as well as the working curriculum, the catalog of the university component (CVK) and the catalog of elective disciplines (CED).

In connection with the opening of a new group of educational programs B126 – "Transport Construction", the materials submitted for consideration were developed. A meeting of the Academic Committee on Educational Programs and leading teachers of the department was held at the Department of Architectural and Construction Engineering with the involvement of representatives of employers and students to discuss the structure and content of the new educational program. Following the discussion, a positive decision was made to approve them.

The presented materials were developed with the participation of employers, students and graduates, taking into account the requirements of regulatory legal acts. The working curriculum and CED for admission in 2025 have been drawn up and agreed with employers.

THEY DECIDED:

1. To approve the presented new educational program "6B07183 - Smart Roads: Digital Technologies in Transport facilities" for admission in 2025, including the Graduate's Competence Model, QED, QVC, work curriculum and educational program passport.

2. Submit these documents for consideration and approval by the Academic Council of the Academy.

Chairman of UMB ITiS **Abdreshov S.A.**
Secretary of UMB ITiS **Murzalina G.B.**

14. APPROVAL SHEET

№	Full name	Place of work/study	Post	Date of approval	Signature
	Сулеева Н.З	ИТиС	директор		[illegible]
	Даубаев К.Ж.	ИПиБ	директор		[illegible]
	Toigozhinova A.Zh	ИЭУТ	директор		[illegible]
	Abdiraiymova	ALT University	head of depart		[illegible]
	Akhmetova P.T	ALT University	Head of Dep		[illegible]
	Lessymova D.T	ALT university	Head of Dep ICT		[illegible]
	Smailova F.I	ALT University	LE department		[illegible]
	Мусалиева Р.Д	ALT univers	зав.каф. ГЧиБ		[illegible]
	Бойкозбаев А.Е	ALT univers.	зав.каф. ГЧиБ.		[illegible]
	Карымсакова А.Т	каф АЦ	зав. каф. АЦ		[illegible]
	Карибаева Т.Б	каф. ТС	зав. каф		[illegible]
	Курмангов К.С	каф. АСЦ	зав. каф		[illegible]

15. CHANGES REGISTRATION SHEET

№	Section, paragraph of the document	Type of change (replace, cancel, add)	Number and date of notification	Change made	
				Date	Surname and initials, signature, position