

**Joint stock company "ALT University
named after Mukhamedzhan Tynyshpayev"**



APPROVED

by the decision of the academic
council of ALT

dated on 12 « 05 », 2025

(Protocol No. 9-1)

President-Rector
Zharmagambetova M.S.

A handwritten signature in blue ink, appearing to read 'Zharmagambetova'.



EDUCATIONAL PROGRAM

**Name: 6B07184 - ENGINEERING OF CONSTRUCTION AND
RAILWAY TECHNOLOGY**

Level of training: bachelor's degree

**Code and classification of areas of training:
6B071 - Engineering and engineering trades**

**Code and group of educational programs:
B265 - Rail transport and technology**

**Date of registration in the Register: 15.07.2025
Registration number: 6B07100163**

Almaty, 2025

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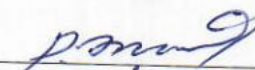
1. INFORMATION ABOUT CONSIDERATION, APPROVAL AND APPROVAL OF THE PROGRAM, DEVELOPERS, EXPERTS AND REVIEWERS

1 DEVELOPED BY:

Associate Professor,
Candidate of Technical Sciences
Associate Professor ALT, Candidate of Technical
Sciences
Associate Professor,
Candidate of Technical Sciences
Associate Professor, PhD
Teaching - assistant

Chief Mechanic of «Almaty Zholdary» LLP

Student gr. PDM-22-1

 Kozbagarov R.A.
 Kaliyev Ye.B.
 Kopenov B.T.
 Begimkulova E.A.
 Kyrgyzbay D.E.
 Zhunisbekov B.D.
 Idris D.G.

2 EXPERTS:

Director of «MegaDrive» LLP

Associate Professor of ITHU, Candidate of
Technical Sciences

 Beketov T.S.
 Tursymbekova Z.Zh.

3 REVIEWER:

Head of the Department of Civil Defense and
Emergency Situations at the Institute of Nuclear
Physics, Candidate of Technical Science

Associate Professor of K.I.Satpayev KazNTU, PhD

 Myrzageldiyev R.A.
 Kamzanov N.S.

4 REVIEWED AND RECOMMENDED:

Meeting of the AC of the department «MV and
SLA»

Protocol № 1 «06» 05 2025 y.

 Toilibaev A.E.

Meeting of the CQA - EMB of the Institute of
Transport and Construction

Protocol № 9.4 «06» 05 2025 y.

 Abdreshov Sh.A.

Meeting of the Educational and Methodological
Council

Protocol № 5 «06» 05 2025 y.

 Baigaraev N.A.

5 APPROVED by the decision of the ALT Academic Council.

Protocol № 9-1 «12» 05 2025 y.

6 INTRODUCED on 15.07.2025 y.

2. REGULATORY REFERENCES

The educational program is developed on the basis of the following legal acts and professional standards:

1. Law of the Republic of Kazakhstan «On Education» dated July 27, 2007 No. 319-III (with amendments and additions as of March 27, 2023).
2. The National Qualifications Framework, approved by the protocol dated March 16, 2016, by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
3. Sectoral qualifications framework for the sphere «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.
4. State obligatory standard of higher and postgraduate education (Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated February 20, 2023 No. 66).
5. Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated August 12, 2022 No. 309.
6. Rules for organizing the educational process on credit technology of education in organizations of higher and (or) postgraduate education, approved by Order of the Minister of the Ministry of Education and Science of the Republic of Kazakhstan No. 152 dated April 20, 2011 (with additions and changes dated April 04, 2023 No. 145).
7. Classifier of areas for training personnel 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 (as amended and supplemented as of June 05, 2020).
8. Algorithm for inclusion and exclusion of educational programs in the Register of educational programs of higher and postgraduate education, approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated December 4, 2018 No. 665 (with additions and changes as of December 23, 2020 No. 536).
9. RI-ALT-33 «Regulations on the procedure for developing an educational program for higher and postgraduate education».

3. PASSPORT OF THE EDUCATIONAL PROGRAM

№	Field name	Note
1	Registration number	6B07100163
2	Code and classification of the field of education	6B07- Engineering, Manufacturing and Civil engineering
3	Code and classification of areas of study	6B071- Engineering and engineering trades
4	Code and group of educational programs	B265 - Rail transport and technology
5	Name of the educational program	6B07184 - Engineering of Construction and Railway technology
6	Type of educational program	Current
7	Purpose of the educational program	Training qualified specialists with professional competencies for the railway and construction sectors, taking into account the increasing requirements for the quality of specialists in the fields of design, production, operation, and maintenance of construction and track machines.
8	Уровень по МСКО	6
9	Уровень по НРК	6
10	Уровень по ОРК	6
11	Distinctive features of the educational program	No
	University partner (JEP)	-
	University partner (TDEP)	-
12	Form of study	Full-time, full-time with transfer to distance learning
13	Language of instruction	Kazakh, Russian
14	Volume of loans	241
15	Awarded Academic Degree	Bachelor of Services in Educational Program 6B07184 - Engineering of Construction and Railway technology
16	Availability of an application to the license for the direction of personnel training	№KZ87LAA00036465

4. THE GRADUATE'S COMPETENCE MODEL

The purpose of the educational program: Training qualified specialists with professional competencies for the railway and construction sectors, taking into account the increasing requirements for the quality of specialists in the fields of design, production, operation, and maintenance of construction and track machines.

Задачи образовательной программы:

1. Formation of a personality capable of self-improvement and professional growth with diverse humanitarian and natural science knowledge and interests.
2. Formation of the ability to critically rethink accumulated experience, change the profile of their professional activities, if necessary, awareness of the social significance of their future profession, and possess high motivation to perform professional activities.
3. Formation of the ability to find a compromise between different requirements (cost, quality, safety and deadlines) in long-term and short-term planning and make optimal decisions in the field of operation, repair and maintenance of construction and track machinery, their aggregates, systems and elements; possess a culture of thinking.
4. Formation of the ability to generalize, analyze, perceive information, set goals and choose ways to achieve them.
5. Assistance in the formation of graduate readiness: to develop design documentation for the creation and modernization of track and road vehicles; to carry out design work on the creation and modernization of track and road vehicles; to develop technical documentation and methodological materials, proposals and measures for the creation and modernization of construction and track vehicles.
6. Formation of graduates' readiness to conduct a feasibility study, comprehensively substantiate decisions made and implemented in the field of operation, repair and maintenance of construction and track machinery, their aggregates, systems and elements; application of the results in practice, striving for self-development, improving their skills and skills.
7. Assistance in the formation of graduates' readiness for the economical and safe use of natural resources, energy and materials in the operation, repair, and maintenance of construction and track machinery.

Learning outcomes:

LO1 - Formulate and justify one's own civic and professional position in different languages, taking into account moral, legal, and scientific foundations, as well as the values of inclusion and sustainability.

LO2 - Analyze and apply knowledge of natural sciences, physics, and mathematics to solve applied problems using scientific methods and research.

LO3 - Apply modern digital technologies, including information and communication systems and elements of artificial intelligence in construction and road engineering, to solve specific tasks.

LO4 - Apply well-founded engineering solutions in working with construction and road machines to meet occupational safety, environmental protection, and resource-saving requirements.

LO5 - Use tools of economic analysis to make decisions aimed at developing transport infrastructure and technical bases, considering the principles of the green economy, sustainable entrepreneurship, and financial and legal literacy.

LO6 - To choose optimal solutions for applied problems related to design, construction, and determination of reliability parameters of parts, assemblies, and metal structures based on fundamental laws of mechanics and engineering methods.

LO7 - Analyze and explain the operating principles of power units, internal combustion engines, drive systems, electrical and hydraulic mechanisms; develop methods for their optimization, assess performance, and implement modern solutions to improve machine

operation.

LO8 - Evaluate methods and tools of comprehensive technical diagnostics of reliability parameters of construction-road, lifting-transport, and earth-moving machinery; justify the design and technological parameters of components and assemblies to optimize their operation based on regulatory and technical documentation.

LO9 - Compare automation indicators, methods of design alternatives and optimization, operational processes of robotic manipulation systems, computer modeling of robotic systems, and production of spare parts for machines during maintenance periods.

LO 10 - Develop technological processes for manufacturing, restoring, and replacing machine parts and assemblies; operation, maintenance, and repair of mechanisms and equipment using modern mechanization tools, organization of loading-unloading and construction-road works, as well as comprehensive mechanization and automation of track maintenance.

Field of professional activity: Construction and track equipment, transport equipment and technologies.

Objects of professional activity:

- Local executive authorities in the field of construction and railway transport and their regional structures;
- Organizations and enterprises of the transport industry in the field of management, operation, maintenance, repair of construction and track machinery, urban rail transport and subways, as well as industrial transport;
- Organizations and enterprises of the transport industry in the field of technologies of material and processing production in the maintenance and repair of construction and track machinery, urban rail transport, subways and industrial transport.

Types of professional activity:

- production and technological;
- organizational and managerial;
- service and operational;
- project..

Functions of professional activity:

- 1) Organization of operation, repair, diagnostics of construction and track vehicles, control of safe operation;
- 2) Development and implementation of technological processes for maintenance and repair, the use of standard methods for calculating the reliability of elements of construction and track machines.
- 3) Management of production processes, analysis of the results of production activities;
- 4) Management of work on the inspection and repair of construction and track vehicles;
- 5) Quality control of all types of repairs of construction and track machinery, monitoring the availability, condition and use of instrumentation;
- 6) Analysis and evaluation of production and non-production costs or resources for high-quality maintenance and scheduled repairs.
- 7) Development of new technologies, development of design and technological documentation using computer technology;
- 8) Calculation of strength and stability under various types of loading, development of machine designs using design methods and fundamentals, selection of materials for manufacturing machine parts, justification of technical solutions;
- 9) Development of technical specifications and specifications for projects of technological, construction and track machines or their components, technological processes, automation tools using information technologies and computer programs;
- 10) Design of new models of construction and track machinery, its components, assem-

blies, equipment, technological processes, automation and protection equipment, corresponding to the latest achievements of science and technology, safety requirements.

The list of specialist positions: foreman of the construction and track machinery section (workshop); engineer, repair engineer; traffic safety inspector for construction and track machinery, specialist in operational management of a column of construction and track machinery brigades, traction rolling stock, special construction and railway rolling stock brigades; specialist in non-destructive testing, specialist in operational management of a repair team and maintenance of construction and track vehicles, a specialist heat engineer.

Professional certificates obtained at the end of training: Слесарь по ремонту путевых и дорожных машин, помощник машиниста строительных и путевых машин.

Requirements for the previous level of education: secondary, post-secondary, vocational secondary.

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

- educational;
- production;
- pre-graduation.

Educational practice.

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

Production practice 1.

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

The objectives of the internship are: to deepen and consolidate the theoretical knowledge gained in the learning process; to acquire skills in the practical use of professional knowledge gained during theoretical training; to learn skills in solving practical and managerial tasks; to become familiar with the specifics of a bachelor's professional activity in a particular industry; to form 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 in the study of theoretical basic and profile disciplines in a particular enterprise or organization and to acquire initial practical experience.

Production practice 2.

The content of industrial practice 2 is determined by the topic of the thesis (project). During the practice period, 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 activities of a particular enterprise (organization) with the student's independent formulation of conclusions, suggestions, recommendations, etc. In the course of practice, the student must demonstrate his knowledge and skills of a specialist, organizational skills, decision-making skills, performance discipline, responsibility, initiative.

The final certification 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 integrat-

ed knowledge and key competencies that meet the requirements of the labor market in accordance with the educational program of higher education.

5. MATRIX OF CORRELATION OF LEARNING OUTCOMES IN THE EDUCATIONAL PROGRAM WITH EDUCATIONAL DISCIPLINES / MODULES

№	Name of the discipline	Number of credits	Matrix for correlating learning outcomes in an educational program with academic disciplines									
			LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10
1	2	3	4	5	6	7	8	9	10	11	12	13
1	History of Kazakhstan	5	+									
2	Philosophy	5	+									
3	Foreign language	10	+									
4	Kazakh (Russian) language	10	+									
5	Information and Communication Technologies	5			+							
6	Socio-Political Knowledge Module	2	+									
7	Sociology	2	+									
8	Culturology	2	+									
9	Political science	2	+									
10	Psychology	8		+								
11	Green economy and sustainable entrepreneurship	5						+				
12	Basics of law and anti-corruption culture	5	+									
13	Fundamentals of financial literacy	5					+					
14	Digital inclusion	5	+									
15	Environmentally sustainable technologies	5				+						
16	Machine parts and design basics	5						+				
17	Engineering graphics and computer modeling	5			+						+	
18	Engineering Mathematics 1	5		+								
19	Engineering Mathematics 2	5		+								
20	Structural materials in transport engineering	4						+				
21	Python programming basics	3			+							
22	Occupational health and safety	5				+						
23	Applied Physics	5		+								
24	Professionally oriented foreign language	3	+									
25	Theoretical mechanics	4						+				
26	Electrical engineering and the basics of electronics	6							+			
27	Hydraulics and hydraulic drive	6							+			
28	Intelligent and digital technologies in track machines	6			+						+	
29	Continuous transport machinery and equipment	6								+		
30	Reliability of construction and railway machinery	6						+		+		
31	Fundamentals of automation of design of construction and track machines	6									+	

32	Fundamentals of calculating the strength of machines and mechanisms	5						+				
33	Machine design automation systems	6						+		+		
34	Basics of technical operation of transport equipment	4						+				+
35	Lifting and transport machines	6								+		
36	Applied Mechanics	5						+				
37	Automated design systems for machines	6									+	
38	Time -management	3					+					
39	Technical operation of construction and track vehicles	4								+	+	+
40	Tribotechnics	4							+			
41	Managerial Economics	3					+					
42	Digital technologies in construction	6			+						+	
43	Metrology, standardization and certification	5								+		
44	Fundamentals of the railway track	5										+
45	Production technology and repair of construction and track machinery	5									+	+
46	Energy installations of transport equipment	5							+			
47	Internal combustion engines	6							+			
48	Infrastructure of construction and track vehicles	4					+					
49	Complex mechanization of loading and unloading operations	6										+
50	Integrated mechanization, automation and mechanization of road construction	6										+
51	Integrated systems of mechanization and automation of road construction	6										+
52	Machines for earthworks	6								+		
53	Mechanization of transshipment operations	6										+
54	Minor program 1	3			+							
55	Minor program 2	3					+					
56	Minor program 3	3									+	
57	Drives and control systems for construction and track machines	6							+			
58	Machine design and construction	6						+				
59	Design of metal structures for construction and track machines	3						+				
60	Travel machines and mechanisms	6								+		
61	Resource saving in transport	3				+						
62	Specialized railway equipment	6								+		
63	Special machines for earthworks	6								+		
64	Means of mechanization of road facilities	6										+
65	Construction machines	6								+		
66	Technical base of construction and track vehicles	4					+					

67	Technical diagnostics of construction and track machines	3								+		
68	The technical basics of creating machines	6						+				

6. STRUCTURE OF THE BACHELOR'S EDUCATIONAL PROGRAM

№ п/п	Name of cycles of disciplines	General labor intensity	
		in academic hours	in academic hours
1	Cycle general education disciplines (GED)	1680	56
1)	Required Component	1530	51
	History of Kazakhstan	150	5
	Philosophy	150	5
	Foreign language	300	10
	Kazakh (Russian) language	300	10
	Information and Communication Technologies	150	5
	Module of socio-political knowledge (sociology, political science, cultural studies, psychology)	240	8
	Physical Culture	240	8
2)	University component and (or) optional component	150	5
2	Cycle of basic and profile disciplines (BD, PD)	at least 5380	at least 176
1)	University component and (or) optional component		
2)	Professional practice		
3	Additional types of training		
1)	Component of choice		
4	Final certification	at least 240	at least 8
	Total	at least 7230	at least 241

7. WORKING CURRICULUM FOR THE WHOLE TERM OF TRAINING

АО «АЛТ Университет имени Мухамеджана Тынышпаева»

УЧЕБНЫЙ ПЛАН

Форма обучения: очная

Направление подготовки:
68071 Инженерия и инженерное дело

Срок обучения: 3 года

Группа образовательных программ:
6805 Железнодорожный транспорт и технологии

Наименование образовательной программы:
6807104-Инженерия строительных и путей машин

Примечание: 2025 год

Специальность: бакалавр техники и технологий



№	Код дисциплины	Наименование циклов и дисциплин	Общая трудоемкость		Форма контроля, семестр	Объем учебной нагрузки, часы							Распределение по семестрам										Зачет за нафедрой	
			в академических часах	в кредитных единицах		Экзам	КР (КР)	Всего часов	Контактные					1 курс										
									лекции	практические	лабораторные	СРП	СРП	1	2	3	4	5	6	7	8	9		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1.1. Обязательный компонент.																								
М1																								
1.1.1. 23-0-08-08 История Казахстана																								
1.1.2. 23-0-08-08 Философия																								
1.1.3. 23-0-08-08 Физическая культура																								
М2																								
1.1.4. 23-0-08-08 Иностранный язык																								
1.1.5. 23-0-08-08 Казахский (Русский) язык																								
М3																								
1.1.6. 23-0-08-08 Социология																								
23-0-08-08 Культурология																								
23-0-08-08 Биология																								
23-0-08-08 Психология																								
М4																								
1.1.7. 23-0-08-08 Информационно-коммуникационные технологии																								
1.2. Компонент по выбору.																								
М5																								
1.2.1. 23-0-08-08 Экологические устойчивые технологии																								
23-0-08-08 Зеленая экономика и устойчивое развитие																								
23-0-08-08 Основы финансовой грамотности																								
23-0-08-08 Цифровая экономика																								
23-0-08-08 Основы права и антикоррупционной культуры																								
23-0-08-08 Основы научных исследований																								
Всего по циклу ООД:																								
2.1.1. 23-0-08-08																								
2.1.2. 23-0-08-08																								
М6																								
2.1.1.1. 23-0-08-08 Инженерная математика 1																								
2.1.1.2. 23-0-08-08 Инженерная математика 2																								
2.1.1.3. 23-0-08-08 Прикладная физика																								
2.1.1.4. 23-0-08-08 Теоретическая механика																								
М7																								
2.1.1.5. 23-0-08-08 Конструкционные материалы и транспортное машиностроение																								
2.1.1.6. 23-0-08-08 Электротехника и основы электроники																								
2.1.1.7. 23-0-08-08 Охрана труда и безопасность жизнедеятельности																								
2.1.1.8. 23-0-08-08 Детали машин и основы конструирования																								
М8																								
2.1.1.9. 23-0-08-08 Информационная графика и компьютерное моделирование																								
2.1.1.10. 23-0-08-08 Основы программирования Python																								
М9																								
2.1.1.11. 23-0-08-08 Профессионально-ориентированный иностранный язык																								
2.1.1.12. 23-0-08-08 Учебная практика																								

2.1.2.	Компонент по выбору:	1200	40	0	1200	130	140	0	120	810	0	0	9	12	0	9	9	10	0
M7		Профессиональный модуль																	
2.1.3.1.	23-0-В-КУ-06 Гидравлика и гидропривод	120	4	3	120	10	20		15	75			4						АТСиБЖД
	23-0-В-КУ-11а Тракторостроение																		
2.1.3.2.	23-0-В-КУ-01РМ Основы расчета прочности машин и механизмов	180	6	3	180	10	20		15	105			5						АТСиБЖД
	23-0-В-КУ-01Р Прикладная механика																		ТС
2.1.3.3.	23-0-В-КУ-04РМ Основы автоматизации проектирования строительных и путевых машин	180	6	6	180	20	20		15	125						6			АТСиБЖД
	23-0-В-КУ-04Р Основы автоматизации проектирования машин																		
2.1.3.4.	23-0-В-КУ-04РМ Надежность строительных и путевых машин	180	6	4	180	20	20		15	125			6						АТСиБЖД
	23-0-В-КУ-01Н Основы теории надежности																		
2.1.3.5.	23-0-В-КУ-01ЕТТ Основы технической эксплуатации транспортной техники	120	4	3	120	20	10		15	75								4	АТСиБЖД
	23-0-В-КУ-01ЕРМ Техническая эксплуатация строительных и путевых машин																		
M4		Модуль информационных технологий и искусственного интеллекта																	
2.1.3.6.	23-0-В-КУ-01ИМ Интеллектуальные и цифровые технологии в путевых машинах	180	6	9	180	20	20		15	125							6		АТСиБЖД
	23-0-В-КУ-01И Цифровые технологии в строительстве																		
2.1.3.7.	23-0-В-КУ-01ИМ Подъемно-транспортные машины	180	6	4	180	20	20		15	125						6			АТСиБЖД
	23-0-В-КУ-01И Машины и оборудование непрерывного транспорта																		
M5		Модуль экономическо-управленческих компетенций																	
2.1.3.8.	23-0-В-КУ-01Е Управленческая экономика	90	3	6	90	10	10		15	55						3			ТУиБ
	23-0-В-КУ-01М Тайм-менеджмент																		
	ВСЕГО по циклу БД	2730	91		2730	250	330	20	215	1785	13	17	17	17	0	12	0	15	0
2.2		Цикл специализирующих дисциплин (гид.)																	
2.2.1	Вузовский компонент:	900	30		900	48	70	10	60	420	0	0	0	0	15	10	0	0	5
M7		Профессиональный модуль																	
2.2.1.1.	23-0-В-КУ-01И Метрология, стандартизация и сертификация	180	6	5	180	10	20		15	105			6						АТСиБЖД
2.2.1.2.	23-0-В-КУ-01ИРМ Технология производства и ремонт строительных и путевых машин	150	6	6	150	10	20		15	105				5					АТСиБЖД
2.2.1.3.	23-0-В-КУ-01И Энергетические установки транспортной техники	150	6	5	150	10	10	10	15	105				6					ТС
M6		Практикоориентированный модуль																	
2.2.1.4.	23-0-В-КУ-01ИР Основы железнодорожного пути	150	6	5	150	10	20		15	105			6						ТС
2.2.1.5.	23-0-В-КУ-01ИР Производственная практика 1	150	6	6	150											6			АТСиБЖД
2.2.1.6.	23-0-В-КУ-01ИР Производственная практика 2 / преддипломная практика	150	6	9	150													6	АТСиБЖД
2.2.2	Компонент по выбору:	1650	55	0	1650	170	190	10	150	1130	4	0	6	0	0	0	21	9	16
M4		Модуль информационных технологий и искусственного интеллекта																	
2.2.2.1.	23-0-В-КУ-01ИР Инфраструктура строительных и путевых машин	120	4	1	120		30		15	75	4								АТСиБЖД
	23-0-В-КУ-01ИР Техническая база строительных и путевых машин																		
2.2.2.2.	23-0-В-КУ-01И Путевые машины и механизмы	180	6	9	180	20	20		15	125							6		АТСиБЖД
	23-0-В-КУ-01И Специализированная железнодорожная техника																		
M7		Профессиональный модуль																	
2.2.2.3.	23-0-В-КУ-01И Технические основы создания машин	180	6	3	180	20	10	10	15	125			6						АТСиБЖД
	23-0-В-КУ-01И Проектирование и конструирование машин																		
2.2.2.4.	23-0-В-КУ-01И Комплексная механизация погрузочно-разгрузочных работ	180	6	7	180	20	20		15	125						6			АТСиБЖД
	23-0-В-КУ-01И Механизация перегрузочных работ																		

8. CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAM

6B07184 - ENGINEERING OF CONSTRUCTION AND RAILWAY TECHNOLOGY

Education level: bachelor's degree

Training period: 3 years

Year of admission: 2025

Cycle	Component	Name of the discipline	General labor intensity		Semester	Learning Outcomes	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10
BD	UC1	Machine parts and design basics	150	5	4	LO6	Studies the basics of theory, calculation and design of parts and assemblies of general-purpose machines, mechanical gears, joints, shafts and axles, bearings and couplings, machine drives, standards and professional standards in the design of components, features and characteristics of structural materials and manufacturing technologies of machine parts. The discipline uses interactive teaching methods, open and closed tests.	Engineering Mathematics 1,2; Structural materials in transport engineering; Fundamentals of calculating the strength of machines and mechanisms; Applied Mechanics	Metrology, standardization and certification; Energy installations of transport equipment; Fundamentals of automation of design of construction and track machines; Production practice 1
BD	UC2	Engineering graphics and computer modeling	150	5	1	LO3	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.	Basic school knowledge in computer science	Engineering Mathematics 2; Python programming basics; Information and communication technologies
BD	UC3	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	Basic school education in mathematics	Engineering Mathematics 2; Python programming basics; Theoretical mechanics

							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.					railway equipment; Integrated mechanization, automation and mechanization of road construction
BD	UC8	Applied Physics	150	5	2	LO2	Formation of skills using fundamental laws, theories of classical and modern physics, as well as methods of physical research, thinking, scientific worldview, in independent cognitive activity, to be able to model physical situations using computer technology and ideas about the modern natural science picture of the world.	Engineering Mathematics 1; Engineering graphics and computer modeling	Electrical engineering and the basics of electronics; Applied Mechanics; Educational practice			
BD	UC9	Professionally oriented foreign language	90	3	6	LO1	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.	Foreign language	Complex mechanization of loading and unloading operations; Drives and control systems for construction and track machines			
BD	UC10	Theoretical mechanics	120	4	2	LO6	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; Structural materials in transport engineering; Engineering graphics and computer modeling	Tribotechnics; Applied Mechanics			
BD	UC11	Electrical engineering and the basics of electronics	180	6	3	LO7	The discipline considers electrical circuits of direct, alternating and three-phase currents, the principle of operation and purpose of the transformer and electrical machines, methods of measuring electrical quantities, application and general rules of operation of semiconductor	Engineering Mathematics 1; Engineering Mathematics 2; Applied Physics	Machine parts and design basics; Reliability of construction and railway machinery			

PD	UC16	Fundamentals of the railway track	150	5	5	0	ciency and environmental protection. Studies the requirements for a railway track depending on the classification of railway lines, structural elements of the upper and lower structures of the railway track, working conditions and deformations of the railway track, standards and tolerances for the maintenance of the track gauge, methods for designing and calculating the track gauge, transverse profiles of the road-bed and methods for calculating the embankment for stability.	Reliability of construction and railway machinery; Lifting and transport machines; Machine design and construction	Production technology and repair of construction and track machinery; Production practice 1; Travel machines and mechanisms
PD	UC17	Production practice 1	150	5	6	LO3 LO5- LO9	The main objectives of industrial practice are: consolidation of theoretical knowledge and practical skills in the chosen educational program in an industrial environment, acquisition of organizational work experience, obtaining a working specialty, formation of practical skills and competencies in the process of mastering the bachelor's program. It is conducted in the practice bases at enterprises according to this educational program. Form of control - protection of the report	Basic and profile disciplines of the EP	Specialized railway equipment; Travel machines and mechanisms; Construction machines
PD	UC18	Industrial practice 2/ pre-graduate practice	150	5	9	LO2- LO10	The purpose of the bachelor's degree program is to ensure the relationship between the theoretical knowledge gained during the assimilation of the chosen educational program and practical activities. The objectives of this practice are to consolidate and deepen the theoretical knowledge acquired by students during their studies, collect information for writing their final qualifying work, study best practices at the enterprise, as well as gain experience in independent research, and master various methods of scientific work. It is conducted in the practice bases at enterprises according to this educational program. Form of control - protection of the report	The main disciplines of the EP	Final certification
PD	UC19	Final certification	240	8		LO1- LO10	The objectives of the thesis are to identify the degree to which the bachelor has mastered the contents of the educational program, to verify his readiness for independent activity in the field of the educational program, to consolidate	Cycle of general educational discipline (GED), Cycle of Basic disciplines (DB), The cycle of profile disci-	

[illegible]

9. CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAM

6B07184 - ENGINEERING OF CONSTRUCTION AND RAILWAY TECHNOLOGY

6B07184 - ENGINEERING OF CONSTRUCTION AND RAILWAY TECHNOLOGY

Education level: bachelor's degree

Training period: 3 years

Year of admission: 2025

Cycl e	Compo nent	Name of the discipline	General labor intensity		Sem ester	Learn ing Outco mes	Brief description of the discipline	Prerequisites	Postrequisites
			in aca- demic hours	in aca- demic credits					
1	2	3	4	5	6	7	8	9	10
GED	EC1	Environmentally sustainable technologies				LO4	The discipline "Environmentally sustainable technologies" studies modern methods and innovative solutions aimed at minimizing the negative impact of human activities on the environment. The course examines the principles of sustainable development, energy-saving technologies, renewable energy sources, waste management strategies, and environmentally sound production processes.	Basic school environmental knowledge	Occupational health and safety
	EC2	Green economy and sustainable entrepreneurship	150	5	6	LO6	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.	The socio-political knowledge module	Managerial Economics, Time -management
	EC3	Fundamentals of financial literacy				LO5	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 finan-	The socio-political knowledge module	Managerial Economics, Time -management

							in the design of sliding bearings, rolling bearings, evaluation of the durability of friction units. The discipline uses interactive teaching methods.				
BD	EC8	Fundamentals of calculating the strength of machines and mechanisms	150	5	3	LO6	Studies the basics of the theory of mechanisms and machines, the resistance of materials, calculation and design of general-purpose parts and assemblies widely used in machines to solve problems aimed at improving the reliability, strength and durability of parts and assemblies in design, construction and operation, using modern educational and information technologies. Methods of active learning – performing individual computational and graphical tasks.	Engineering Mathematics 2; Applied Physics; Theoretical mechanics	Machine parts and design basics; Machine design automation systems; Lifting and transport machines		
	EC9	Applied Mechanics				LO6	Studies the theoretical foundations and methods of calculations for strength, rigidity, durability and stability of structural elements of transport structures, the main types of mechanisms, parts and assemblies of machines, general principles of design and construction, which is necessary when assessing the reliability of existing equipment in operating conditions. Methods of active learning – performing individual computational and graphical tasks.	Engineering Mathematics 2; Applied Physics; Theoretical mechanics	Machine parts and design basics; Machine design automation systems; Lifting and transport machines		
BD	EC10	Fundamentals of automation of design of construction and track machines	180	6	6	LO9	Studies methods of automation of design of construction and track machines using modern software tools. Special attention is paid to computer-aided design (CAD) systems, 3D modeling, digital technologies, analysis and optimization of structures. Practical skills are being developed in the development, evaluation and improvement of equipment for the construction and transport industries.	Metrology, standardization and certification; Energy installations of transport equipment; Fundamentals of the railway track	Complex mechanization of loading and unloading operations; Machines for earthworks; Drives and control systems for construction and track machines		
	EC11	Automated design systems for machines				LO9	The discipline explores key principles and tools for automating machine design using modern CAD systems. It covers methods of 3D modeling, parameterization, structural analysis, and creation of design documentation. Special attention is given to the use of digital twins and artificial intelligence algorithms to optimize design decisions and enhance engineering efficiency in a virtual environment.	Metrology, standardization and certification; Energy installations of transport equipment; Fundamentals of the railway track	Complex mechanization of loading and unloading operations; Machines for earthworks; Drives and control systems for construction and track machines		

BD	EC12	Reliability of construction and railway machinery	180	6	4	LO6	Explores principles of ensuring the reliable and long-term operation of construction and road machinery, analyzing causes of failures and methods for their prevention. Covers theoretical foundations of reliability, failure types and parameters, technical diagnostics, preventive maintenance, repair planning, and service life prediction. Emphasis is placed on operational conditions, technical and economic indicators, and improving machine efficiency. Students develop practical skills to ensure uninterrupted and safe machinery performance in real-world working environments.	Tribotechnics; Applied Mechanics; Electrical engineering and the basics of electronics	Metrology, standardization and certification; Energy installations of transport equipment
	EC13	Machine design automation systems				LO6	Focuses on fundamental principles and mathematical methods for analyzing the reliability of technical systems and components. Topics include failure-free performance, durability, maintainability, and storability. Emphasis is placed on probabilistic failure models, reliability functions, calculation of reliability indicators, and development of reliability assurance schemes. Students gain skills in assessing technical resources and justifying decisions during design, operation, and modernization of equipment.	Tribotechnics; Applied Mechanics; Electrical engineering and the basics of electronics	Metrology, standardization and certification; Energy installations of transport equipment
BD	EC14	Basics of technical operation of transport equipment	120	4	8	LO6	The principles of ensuring the operability of transport equipment, maintenance and repair systems, as well as patterns of changes in its technical condition are considered. Competencies are being formed in the field of operational management, technical resource assessment and informed decision-making in specific production environments. Regulatory approaches, the structure of engineering services, and elements of sustainable operation, taking into account resource conservation, are being studied.	Complex mechanization of loading and unloading operations; Machines for earthworks; Drives and control systems for construction and track machines	Travel machines and mechanisms; Integrated mechanization, automation and mechanization of road construction; Technical diagnostics of construction and track machines; Industrial practice 2 / pre-graduate practice
	EC15	Technical operation of construction and track vehicles				LO8, LO9, LO10	Focuses on the organization of technical operation of construction and road machinery, including maintenance, current and major repairs, diagnostics, and service life extension. Covers operating modes, working conditions, lubricants, control systems, and technical condition monitoring. Evaluates the impact of operational factors on reliability, performance, and economic efficiency. Develops practical skills for making informed	Complex mechanization of loading and unloading operations; Machines for earthworks; Drives and control systems for construction and track machines	Travel machines and mechanisms; Integrated mechanization, automation and mechanization of road construction; Technical diagnostics of construction and track machines; Industrial practice 2 / pre-graduate practice

						decisions on machinery operation in various climatic and technological conditions.						
	EC16	Intelligent and digital technologies in track machines					LO3, LO9				Mechanization of transshipment operations; Special machines for earthworks; Internal combustion engines	Specialized railway equipment; Integrated systems of mechanization and automation of road construction; Industrial practice 2 / pre-graduate practice
BD	EC17	Digital technologies in construction	180	6	8	The discipline studies digital technologies applied in the design, analysis, and operation of road construction machinery and equipment. It covers digital modeling methods for earthmoving, material processing, concrete mixing, and pavement laying processes. The interaction between working components and materials is analyzed through simulations and digital twins, while machine parameters are selected using AI and data analysis. Topics include predictive diagnostics, automated control, and the use of intelligent systems for optimizing maintenance. Examples of BIM and CAD/CAM technologies in road construction are also presented.	LO3, LO9				Mechanization of transshipment operations; Special machines for earthworks; Internal combustion engines	Specialized railway equipment; Integrated systems of mechanization and automation of road construction; Industrial practice 2 / pre-graduate practice
	EC18	Lifting and transport machines	180	6	4	The discipline examines the following issues: general information; assembly units, parts of lifting and transport machines; lifting and transporting machines. The general devices and operating processes of lifting and transport machines, methods of basic parameters and determination of their structural and operational characteristics, the basics of the methodology for selecting braking and stopping devices, and the methodology for selecting engines, gearboxes, and lifting devices from among the normalized or standard ones are studied.	LO8				Hydraulics and hydraulic drive; Fundamentals of calculating the strength of machines and mechanisms; Electrical engineering and the basics of electronics; Educational practice	Metrology, standardization and certification; Energy installations of transport equipment; Fundamentals of the railway track
PD	EC19	Continuous transport machinery and equipment				Explores principles of ensuring the reliable and long-term operation of construction and road machinery, analyzing causes of failures and methods for their prevention. Covers theoretical foundations.	LO8				Hydraulics and hydraulic drive; Fundamentals of calculating the strength of	Metrology, standardization and certification; Energy installations of transport equipment; Fundamentals

						tions of reliability, failure types and parameters, technical diagnostics, preventive maintenance, repair planning, and service life prediction. Emphasis is placed on operational conditions, technical and economic indicators, and improving machine efficiency. Students develop practical skills to ensure uninterrupted and safe machinery performance in real-world working environments.	machines and mechanisms; Electrical engineering and the basics of electronics; Educational practice	of the railway track
PD	EC20	Managerial Economics	90	3	6	LO5	Green economy and sustainable entrepreneurship; Fundamentals of financial literacy; Basics of law and anti-corruption culture	Final certification
	EC21	Time - management				LO5	Green economy and sustainable entrepreneurship; Fundamentals of financial literacy; Basics of law and anti-corruption culture	Final certification
PD	EC22	Infrastructure of construction and track vehicles	120	4	1	LO5	The socio-political knowledge module	Information and communication technologies; Applied Physics; Theoretical mechanics

EC23	Technical base of construction and track vehicles	180	6	9	LO5	The discipline examines the following issues: general information about railway transport, construction and track vehicles, types of railway transport, their features and importance in the country's economy, transport products, its meters, the main directions of transport policy, features and technical and economic characteristics of the use of construction and track vehicles, the role of railways in the unified transport system of the country, the main indicators of its work, the work of railway transport in modern economic conditions.	The socio-political knowledge module	Information and communication technologies; Applied Physics; Theoretical mechanics	
PD	EC24	Travel machines and mechanisms	180	6	9	LO8	The design, theory and calculation of track machines and mechanisms used in the construction, repair and maintenance of railways are studied. The working processes, methods of ballasting, straightening of the track, cleaning of crushed stone and snow, as well as control and measuring equipment are considered. Methods of calculation and selection of parameters of working bodies of machines are given.	Occupational health and safety; Intelligent and digital technologies in track machines; Construction machines	Industrial practice 2 / pre-graduate practice; Final certification
	EC25	Specialized railway equipment				LO8	The types, structure and principles of operation of specialized railway equipment used for laying, repairing and maintaining tracks, contact network and infrastructure are considered. Technical parameters, operating conditions and application technologies are being studied. Skills of analysis, selection and effective use of machines in various production conditions of railway transport are being developed.	Occupational health and safety; Intelligent and digital technologies in track machines; Construction machines	Industrial practice 2 / pre-graduate practice; Final certification
PD	EC26	The technical basics of creating machines	180	6	3	LO6	He studies the basic principles and methods of designing construction and track machines, design documentation, standardization in mechanical engineering, issues of invention and rationalization in the designer's work, analysis of patent information and scientific and technical literature, technical and economic indicators of machines at the design stage, the choice of optimal solutions to improve the quality of machines.	Theoretical mechanics; Applied Physics	Machine parts and design basics; Reliability of construction and railway machinery; Lifting and transport machines
	EC27	Machine design and construction				LO6	Covers principles, methods, and stages of designing machines and their components with a focus on strength, reliability, manufacturability, and	Theoretical mechanics; Applied Physics	Machine parts and design basics; Reliability of construction and railway ma-

							safety. Includes analysis of static and dynamic loads, material selection, standardization of components, and application of modern CAD systems. Emphasis is placed on developing practical skills in engineering design, technical documentation, and using analytical approaches for solving complex mechanical engineering problems. Encourages systems thinking essential for effective machine development.		chinery; Lifting and transport machines
PD	EC28	Complex mechanization of loading and unloading operations	180	6	7	LO10	Covers systems and processes of comprehensive mechanization of loading and unloading operations using specialized machines and equipment. Examines types of handling mechanisms, technological schemes, process automation, and equipment selection based on cargo type and operating conditions. Evaluates the impact of mechanization on productivity, labor intensity, and occupational safety. Develops skills in designing mechanized work areas, selecting efficient technical solutions, and assessing the effectiveness of applied systems.	Production technology and repair of construction and track machinery; Automated design systems for machines; Industrial practice 1	Construction machines; Means of mechanization of road facilities; Resource saving in transport
	EC29	Mechanization of transshipment operations				LO10	The discipline studies the structure, technological operations and main indicators of the transshipment process, technical means of mechanization of transshipment operations, their characteristics and scope of application, performance of transshipment machines, lifting devices for cyclic machines, universal schemes of transshipment, classifications, warehouses, and the transshipment process is also studied as an integral part of the transport process.	Production technology and repair of construction and track machinery; Automated design systems for machines; Industrial practice 1	Construction machines; Means of mechanization of road facilities; Resource saving in transport
PD	EC30	Machines for earthworks	180	6	7	LO8	The discipline studies the following issues: general information; earthmoving machines; earthmoving and transport machines; machines and equipment for soil compaction, preparatory, auxiliary and special earthworks; fundamentals of the design and operation of machines for earthworks, current development trends, work features and methods of calculating operating parameters, improving methods of using the fleet of earthmoving machines and increase their productivity.	Production technology and repair of construction and track machinery; Fundamentals of automation of design of construction and track machines; Industrial practice 1	Construction machines; Means of mechanization of road facilities; Resource saving in transport
	EC31	Special ma-				LO8	The discipline examines the following issues:	Production technology and repair of construction machines;	Construction machines;

						general information, machines for preparatory and earthmoving operations, drilling and crane machines, machines for compacting soil and other materials, ramming machines, small-sized drilling machines from Merlot, a small-scale roller on a Merlot loader, vibrating plates.		gy and repair of construction and track machinery; Fundamentals of automation of design of construction and track machines; Industrial practice 1	Means of mechanization of road facilities; Resource saving in transport
PD	EC32	Construction machines	180	6	8	LO8	The classification of construction machinery, principles of complex mechanization, calculation of productivity, purpose and device of various types of machinery are studied. The high-altitude and traction-speed characteristics, parameters of lifting and transport, earthen, pile, transport and soil compaction machines are considered. The theoretical foundations, examples of calculations and principles of optimal machine acquisition are given.	Complex mechanization of loading and unloading operations; Machines for earthworks; Internal combustion engines	Travel machines and mechanisms; Integrated mechanization, automation and mechanization of road construction; Industrial practice 2 / pre-graduate practice
	EC33	Means of mechanization of road facilities				LO10	The discipline examines the following issues: basic information about the purpose, scope, device, work processes and technological capabilities of the means of mechanization used in the road industry, general information about the types of machines and mechanisms of domestic and foreign production that are most common in the construction, maintenance and repair of city streets and highways, the main technical characteristics for calculating their performance.	Complex mechanization of loading and unloading operations; Machines for earthworks; Internal combustion engines	Travel machines and mechanisms; Integrated mechanization, automation and mechanization of road construction; Industrial practice 2 / pre-graduate practice
PD	EC34	Drives and control systems for construction and track machines	180	6	7	LO7	Covers the design, operation principles, and application features of mechanical, hydraulic, pneumatic, and electric drives used in construction and road machinery. Examines control systems including automated and electronic modules, sensors, and actuators. Focuses on drive characteristics, control schemes, reliability, and operational efficiency. Develops practical skills in selecting and designing drive and control systems considering working conditions, safety, and energy efficiency.	Energy installations of transport equipment; Production technology and repair of construction and track machinery	Construction machines; Resource saving in transport; Intelligent and digital technologies in track machines; Technical operation of construction and track vehicles
	EC35	Internal combustion engines				LO7	The discipline studies the following issues: engine performance and operating conditions; engine characteristics; calculation of the actual engine	Energy installations of transport equipment; Production	Construction machines; Resource saving in transport; Intelligent and

									and repair of construction and track machinery; Production practice 1	machines
EC40	Resource saving in transport							LO4	Infrastructure of construction and track vehicles; Technical base of construction and track vehicles; Green economy and sustainable entrepreneurship	Industrial practice 2 / pre-graduate practice; Final certification
PD		90	3	8						
EC41	Minor program 2							5	Infrastructure of construction and track vehicles; Technical base of construction and track vehicles; Green economy and sustainable entrepreneurship	Industrial practice 2 / pre-graduate practice; Final certification
EC42	Technical diagnostics of construction and track machines							LO8	Means of mechanization of road facilities; Resource saving in transport	Final certification
PD		90	3	9						
EC43	Minor program 3							LO9	Means of mechanization of road facilities; Resource saving in transport	Final certification
Total:		3000	100							

						cycle; basic principles of operation of an internal combustion engine, processes of intake and exhaust of the working mixture, exhaust gases, indicators of efficiency, efficiency and perfection of the engine design, parameters and indicators of gas exchange processes, heat exchange and thermal balance during compression. The methods of complex mechanization and automation of road construction processes are being studied, including the use of specialized equipment for laying, excavation and planning. Technologies for improving the mechanical equipment of construction are considered, as well as the introduction of automated systems to improve the efficiency, quality and safety of road works at all stages of construction.	technology and repair of construction and track machinery	digital technologies in track machines; Technical operation of construction and track vehicles
PD	EC36	Integrated mechanization, automation and mechanization of road construction	180	6	9	LO10	Digital technologies in construction; Basics of technical operation of transport equipment; Means of mechanization of road facilities	Final certification
	EC37	Integrated systems of mechanization and automation of road construction				LO10	Digital technologies in construction; Basics of technical operation of transport equipment; Means of mechanization of road facilities	Final certification
PD	EC38	Design of metal structures for construction and track machines	90	3	7	LO6	Fundamentals of automation of design of construction and track machines; Production technology and repair of construction and track machinery; Production practice 1	Basics of technical operation of transport equipment; Intelligent and digital technologies in track machines; Construction machines
	EC39	Minor program 1				LO3	Fundamentals of automation of design of construction and track machines; Production technology	Basics of technical operation of transport equipment; Intelligent and digital technologies in track machines; Construction machines

10. EXPERT OPINIONS

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ на образовательную программу 6B07184 – Инженерия строительных и путевых машин

Реализация образовательной программы «6B07184 – Инженерия строительных и путевых машин» (ОП «ИС и ПМ») осуществляется посредством последовательности изучаемых дисциплин, с установлением конкретных задач и целевых индикаторов. Четко прослеживается междисциплинарное взаимодействие, которое заключается в комплексной связи между содержанием отдельных учебных дисциплин, посредством которых достигается внутреннее единство программы подготовки специалистов.

В учебном плане ОП «ИС и ПМ» определен перечень всех учебных дисциплин обязательного компонента и компонента по выбору, трудоемкость каждой учебной дисциплины в кредитах, последовательность их изучения, виды учебных занятий и формы контроля.

Образовательные траектории разработаны в соответствии с запросами строительно-путевой отрасли.

Необходимо отметить, что в разработанной ОП «ИС и ПМ» введены новые дисциплины, относящиеся к минорным программам, такие как Проектирование металлоконструкций строительных и путевых машин и Минор 1, Ресурсосбережение на транспорте и Минор 2, Техническая диагностика строительных и путевых машин и Минор 3, что является большим преимуществом при получении профессиональных знаний в области проектирования, производства, эксплуатации и ремонта строительных и путевых машин строительной и железнодорожной отраслей.

Также хотелось бы отметить управленческие дисциплины – Управленческая экономика (Минор) и Тайм-менеджмент (Минор), которые позволяют будущим выпускникам правильно распоряжаться своим временем и быть хорошим управленцем.

Цель ОП «ИС и ПМ» актуальна, сформулирована достаточно лаконично и объединяет в себе результаты обучения. В описании дисциплин отражены их цели и содержание, как индикатора достижения результатов обучения по данной образовательной программе. Также, в образовательной программе отражены основные трудовые функции в компетенциях и результатах обучения, указаны виды связей с работодателями: проведение гостевых лекций, лекций ведущих топ менеджеров, наличие филиалов кафедр на базе организаций.

Таким образом, представленная на экспертизу образовательная программа «6B07184 – Инженерия строительных и путевых машин» по направлению подготовки кадров «6B071 - Инженерия и инженерное дело», полностью соответствует требованиям ГОСО, имеет четкую последовательность при разработке, отвечает современным запросам рынка труда, профессиональным стандартам и может быть реализована для подготовки кадров по образовательной программе «6B07184 – Инженерия строительных и путевых машин» по направлению «6B071 - Инженерия и инженерное дело».

К.т.н., ассоц. профессор
Международного транспортно-гуманитарного
университета г.Алматы



Турсымбекова З.Ж.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ
на образовательную программу
6B07184 – Инженерия строительных и путевых машин

Обучение бакалавров по образовательной программе «6B07184 – Инженерия строительных и путевых машин» (ОП «ИС и ПМ») осуществляется посредством последовательности изучаемых дисциплин, с установлением конкретных задач и целевых индикаторов. Четко прослеживается междисциплинарное взаимодействие, которое заключается в комплексной связи между содержанием отдельных учебных дисциплин, посредством которых достигается внутреннее единство программы подготовки специалистов.

В учебном плане ОП «ИС и ПМ» определен перечень всех учебных дисциплин обязательного компонента и компонента по выбору, трудоемкость каждой учебной дисциплины в кредитах, последовательность их изучения, виды учебных занятий и формы контроля. Актуально изучение вопросов экологической обстановки и обеспечение условий безопасной трудовой деятельности в ТОО «MegaDrive».

Образовательные траектории разработаны в соответствии с запросами строительно-дорожной отрасли.

Очень актуально изучение дисциплин «Технические основы создания машин», «Строительные машины» и «Путевые машины и механизмы», охватывающих вопросы проведения расчетно-проектных работ по созданию и модернизации конструкций машин, технологий и форм организации диагностики, технического обслуживания и ремонта путевых и дорожных машин.

Цель ОП «ИС и ПМ» актуальна, сформулирована достаточно лаконично и объединяет в себе результаты обучения. В описании дисциплин отражены их цели и содержание, как индикатора достижения результатов обучения по данной образовательной программе. Также, в образовательной программе отражены основные трудовые функции в компетенциях и результатах обучения, указаны виды связей с работодателями: проведение гостевых лекций, лекций ведущих топ-менеджеров, наличие филиалов кафедр на базе организаций.

В целом, представленная на экспертизу образовательная программа «6B07184 – Инженерия строительных и путевых машин» по направлению подготовки кадров «6B071-Инженерия и инженерное дело», полностью соответствует требованиям ГОСО, имеет четкую последовательность при разработке, отвечает современным запросам рынка труда, профессиональным стандартам и может быть реализована для подготовки кадров по образовательной программе «6B07184 – Инженерия строительных и путевых машин» по направлению «6B071 - Инженерия и инженерное дело».

Директор
ТОО «MegaDrive»



Бекетов Т.С.

11. REVIEWER'S CONCLUSION

РЕЦЕНЗИЯ

на образовательную программу
по направлению подготовки 6В07184 – Инженерия строительных и путевых машин

Образовательная программа бакалавриата «6В07184 – Инженерия строительных и путевых машин» содержит следующую информацию: квалификация выпускника, форму и срок обучения, направление и характеристики деятельности выпускников, приведен полный перечень компетенций, которыми должен обладать выпускник в результате освоения данной образовательной программы.

Дисциплины учебного плана по рецензируемой образовательной программе формируют весь необходимый перечень общекультурных и профессиональных компетенций, предусмотренных ГОСО по соответствующим видам деятельности.

В учебном плане образовательной программы определен перечень всех учебных дисциплин обязательного компонента и компонента по выбору, трудоемкость каждой учебной дисциплины в кредитах, последовательность их изучения, виды учебных занятий и формы контроля. Каталог элективных дисциплин, Каталог внутривузовского компонента полностью отражают преемственность дисциплин (например, для изучения дисциплины «Основы автоматизации проектирования строительных и путевых машин» изучаются дисциплины «Инженерная графика и компьютерное моделирование» и «Информационно-коммуникационные технологии» и т.д.).

Соблюдена последовательность изучения дисциплин, включены дисциплины, необходимые для производства и технологического процесса.

Содержание рабочих программ учебных дисциплин и практик позволяет сделать вывод, что оно соответствует компетентностной модели выпускника.

Образовательная программа предусматривает профессионально-практическую подготовку обучающихся в виде практики. Содержание программ практик свидетельствует об их способности сформировать практические навыки обучающихся.

Для разработки образовательной программы были привлечены опытный профессорско-преподавательский состав, ведущие представители работодателей, обучающиеся, учтены их требования при формировании дисциплин профессионального цикла.

Закключение:

В целом, рецензируемая образовательная программа «6В07184 – Инженерия строительных и путевых машин» отвечает основным требованиям ГОСО, отраслевой рамке квалификаций, профессиональных стандартов и способствует формированию общекультурных и профессиональных компетенций по направлению подготовки «6В071 – Инженерия и инженерное дело».

Рецензент:

PhD, ассоц. преподаватель

КазНУТУ им. К.Сатпаева

(Satbayev University) ҚЫЗМЕТІ



Камзанов Н.С.

РЕЦЕНЗИЯ
на образовательную программу «6В07184 – Инженерия строительных и
путевых машин»

Представленная на рецензирование образовательная программа подготовки бакалавров по направлению «6В07184 – Инженерия строительных и путевых машин» разработана в полном соответствии с нормативными требованиями. Программа четко определяет квалификацию выпускника, а также содержит детальную характеристику его будущей профессиональной деятельности и полный список необходимых компетенций.

Структура учебного плана обеспечивает формирование всего спектра общекультурных и профессиональных компетенций, установленных государственным общеобязательным стандартом образования (ГОСО) для данного направления. Перечень дисциплин обязательного и элективного компонентов логически выстроен, указана трудоемкость каждого курса в кредитах и определены формы итогового контроля. Особого внимания заслуживает каталог элективных дисциплин, который демонстрирует продуманную преемственность курсов. Например, освоению дисциплины «Основы автоматизации проектирования строительных и путевых машин» предшествует изучение «Инженерной графики и компьютерного моделирования» и «Информационно-коммуникационных технологий».

Содержание рабочих программ и практик полностью соответствует заявленной компетентностной модели выпускника. Программа включает обязательную профессиональную практику, нацеленную на формирование у студентов устойчивых практических навыков.

Важно отметить, что к разработке программы были привлечены ключевые стейкхолдеры: опытные преподаватели, ведущие работодатели отрасли и сами обучающиеся, чьи рекомендации были учтены при формировании цикла профессиональных дисциплин.

Заключение: Образовательная программа «6В07184 – Инженерия строительных и путевых машин» полностью соответствует требованиям ГОСО, отраслевой рамке квалификаций и профессиональным стандартам. Она обеспечивает качественную подготовку компетентных специалистов в области инженерии и инженерного дела.

Рецензент:

**Начальник отдела гражданской обороны и
чрезвычайных ситуации РГП на ПХВ
«Институт ядерной физики», к.т.н.**



Мырзагельдиев Р.А.

12. RECOMMENDATION LETTERS

РЕКОМЕНДАТЕЛЬНОЕ ПИСЬМО

Зав. кафедрой «АТС и БЖД»
АЛТ Университета
им. М. Тынышпаева
Тойлыбаеву А.Е.

Уважаемый Асылбек Ермаханович!

Руководство ТОО «Алматы жолдары» в лице главного механика Жунисбекова Б.Д. ознакомилось с содержанием образовательной программы «6B07184 – Инженерия строительных и путевых машин» и внесло следующие рекомендации:

- включить в содержание образовательной программы дисциплины, связанные с интеллектуальным и цифровым технологиям в машинах;
 - увеличить количество часов, выделяемых на проведение части практических занятий на базах работодателей с целью формирования определенных видов профессиональных компетенций;
 - актуализировать содержание образовательных программ путем включения в цикл базовых и профилирующих модулей дисциплины, отражающие современные инновационные технологии в строительно-транспортной сфере. Предлагается включить следующие дисциплины: Интеллектуальные и цифровые технологии в путевых машинах, Инфраструктура строительных и путевых машин, Приводы и системы управления строительных и путевых машин, Ресурсосбережение на транспорте.
 - увеличить количество часов, выделяемых на проведение производственных практик;
- включить дисциплины:
- с информационно-коммуникационные технологии;
 - касающиеся организации производства и охраны труда;
 - экономического и управленческого характера;
 - с программным обеспечением;
 - графики ППР и т.д.

Главный механик
ТОО «Алматы жолдары»



Жунисбеков Б.Д.

13. PROTOCOLS OF REVIEW AND APPROVAL

АО «АЛТ УНИВЕРСИТЕТ ИМЕНИ МУХАМЕДЖАНА ТЫНЫШПАЕВА»

ПРОТОКОЛ №1

Заседания

Академического комитета по ОП

«6B07184 – Инженерия строительных и путевых машин»

и ведущих преподавателей кафедры «Автотранспортные средства и безопасность жизнедеятельности»

г. Алматы

«6» мая 2025 года

Председатель: Председатель АК «6B07184 – Инженерия строительных и путевых машин», ассоциированный профессор кафедрой «АТС и БЖД», к.т.н., Козбагаров Р.А.

Секретарь: сениор-лектор Бегимкулова Э. А.

Присутствовали:

Члены Академического комитета, ведущие ППС кафедры: и.о. зав. кафедрой Тойлыбаев А.Е., ассоц. профессора: Баубеков Е.Е., Жусупов К.А., Козбагаров Р.А., Копенов Б.Т., Найманова Г.Т., Есенгалиев М.Н., Имангалиева А.К., Дюсембин Е.А., ассистент профессора: Калиев Е.Б., Каржаубаев А.С., Бимагамбетова Л.Н., сениор-лекторы: Торгаев А.А., Курмашев Б.Б., Бегимкулова Э. А., Токтамысова Т. Р., Толунбеков Н.К., ассистент-преподаватели: Омарова Т.К., Кыргызбай Б., Асыллов Ф.

Представители с производства - члены Академического комитета: Главный механик ТОО «Алматы жолдары» - Жунисбеков Б.Д.

Обучающийся-член Академического комитета: студент гр. ПДМ-22-1 Идрис Д.Ф.

ПОВЕСТКА ДНЯ:

1. Рассмотрение новых образовательных программ бакалавриата для включения в реестр.

По первому вопросу

СЛУШАЛИ: Председателя Академического комитета (АК), ассоциированного профессора кафедры «Автотранспортные средства и безопасность жизнедеятельности» (АТС и БЖД), к.т.н., Козбагарова Р.А., который предложил рассмотреть подготовленные материалы для новой образовательной программы «6B07184 – Инженерия строительных и путевых машин» с целью включения её в реестр.

В связи с открытием новой группы образовательных программ В265 – «Железнодорожный транспорт и технологии» были разработаны представленные на рассмотрение материалы.

При разработке новой программы «6B07184 – Инженерия строительных и путевых машин» членами Академического комитета была проведена следующая работа:

1. Исследование сферы профессиональной деятельности.
2. Выявление профессионально значимых компетенций, с особым акцентом на управленческие навыки.
3. Обсуждение с заинтересованными сторонами (стейкхолдерами). Проведён анализ рекомендаций потенциальных работодателей. Совместно со стейкхолдерами были сформированы результаты обучения (РО) на основе детализации компетенций. В состав АК включен представитель стейкхолдеров – главный механик ТОО «Алматы жолдары» Жунисбеков Б.Д.
4. Определение взаимосвязи результатов обучения и критериев их оценки. Была установлена структура оценки, основанная на освоении дисциплин, прохождении производственной практики и защите дипломной работы.

Председатель АК подчеркнул актуальность введения новой образовательной программы, объяснив её следующими факторами:

1. Стратегическая значимость отрасли. Железнодорожный транспорт является ключевым элементом экономики, и для его модернизации и надёжной эксплуатации строительных и путевых машин необходимы высококвалифицированные специалисты.

2. Цифровизация и инновации. Активное внедрение цифровых технологий в управление и обслуживание подвижного состава требует подготовки специалистов с соответствующими компетенциями.

3. Запросы рынка труда. Работодатели отмечают дефицит специалистов, способных решать прикладные задачи, связанные с эксплуатацией, ремонтом и управлением строительными и путевыми машинами.

4. Практическая направленность. Формат обучения в течение трёх лет позволяет оперативно подготовить кадры, ориентированные на решение текущих задач отрасли, с акцентом на практическую деятельность.

5. Устойчивое развитие. Программа направлена на внедрение экологически чистых технологий и повышение энергоэффективности в строительной и путевой отрасли.

6. Карьерные перспективы выпускников. Выпускники программы будут востребованы на ключевых и инженерных должностях в транспортных компаниях.

Введение новой образовательной программы «6В07184 – Инженерия строительных и путевых машин» позволит оперативно ответить на потребности рынка труда, укрепить образовательный потенциал и обеспечить развитие железнодорожной отрасли.

ВЫСТУПИЛ: Член АК, ассоциированный профессор АЛТ кафедры «Автотранспортные средства и безопасность жизнедеятельности» Калиев Е.Б., который представил материалы подготовленные для новых ОП ОП «6В07184 – Инженерия строительных и путевых машин»:

- анализ по ВУЗам;
- предложение наименования ОП;
- рекомендательные письма от стейхолдеров;
- разработанные структурные элементы (Паспорт, РО) - компетентностную модель выпускника, которая включает в себя следующие составные элементы: цель и задачи образовательной программы; результаты обучения; область, объекты, виды и функции профессиональной деятельности; перечень должностей по образовательной программе; профессиональные сертификаты, полученные по окончании обучения; требования к предшествующему уровню образования.

- учебный план на полный срок обучения (проект);
- описание дисциплин, прокет КЭД и КВК.

Было отмечено, что представленные материалы разработаны при участии работодателей, обучающихся и выпускников, с учётом требований НПА.

1) **ВЫСТУПИЛ:** Представитель работодателей, член АК ОП бакалавриата «6В07184 – Инженерия строительных и путевых машин», Главный механик ТОО «Алматы жолдары» - Жунисбеков Б.Д., который отметил, актуальность представленных материалов и своевременность введения дисциплин блока ПД, особенно связанных с освоением управленческих компетенций.

2) **ВЫСТУПИЛ:** Представитель обучающихся: член АК ОП 6В07118 - ПДМ, студент гр. ПДМ-22-1 Идрис Д.Г., которая отметила особую актуальность введения предлагаемых дисциплин «Цифровые технологии в строительстве», «Интеллектуальные и цифровые технологии в путевых машинах».

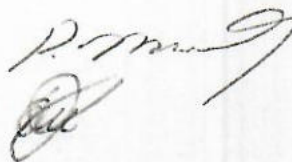
ПОСТАНОВИЛИ:

1) Одобрить подготовленные для новой ОП «6В07184 – Инженерия строительных и путевых машин» для внесения в реестр:

- разработанные структурные элементы (Паспорт, РО), компетентностную модель выпускника;
 - учебный план на полный срок обучения (проект):
 - описание дисциплин, проект КЭД и КВК.
- 2) Представить данные материалы для дальнейшего рассмотрения на КОК УМБ института «Транспорт и строительство».

Председатель:

Секретарь:



Козбагаров Р.А.

Бегимкулова Э.А.

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
АО «АЛТ УНИВЕРСИТЕТ ИМ. МУХАМЕДЖАНА ТЫНЫШПАЕВА»
ИНСТИТУТ ТРАНСПОРТА И СТРОИТЕЛЬСТВА

ВЫПИСКА из протокола № 9,А
внеочередного заседания Учебно-методического бюро (УМБ)
института «Транспорт и строительство»

г. Алматы

6 мая 2025г.

Председатель: Абдрешов Ш.А.

Секретарь: Мурзалина Г.Б.

Присутствовали: Абдрешов Ш.А., Сүлеева Н.З., Мурзалина Г.Б., Мусин Н.Г., Чигабаев Т.О., Кулманов К.С., Тойлыбаев А.Е., Карибаева Г.Б., Утепова А.У., Кибитова Р.К., Дюсенгалиева Т.М., Бихожаева Г.С., Жусупов К.А., Найманова Г.Т., Жасоқбай Р.Г., Садыков А.А., Оспанов Е.К., Айтбаев Е.Е., Еркашов Е., Койшыбай А.А.

ПОВЕСТКА ДНЯ:

1. Обсуждение новых образовательных программ на 2025-26 учебный год.

По вопросу

СЛУШАЛИ: директора ИТиС Абдрешова Ш.А., который предложил рассмотреть следующие разделы образовательных программ для приёма 2025 года: Компетентностную модель выпускника и паспорта образовательных программ, а также рабочие учебные планы, каталоги вузовского компонента (КВК) и каталоги элективных дисциплин (КЭД).

ВЫСТУПИЛ:

1) И.о. заведующего кафедрой Тойлыбаев А.Е., который представил на рассмотрение разделы новой образовательной программы «6В07184 – Инженерия строительных и путевых машин» для приёма 2025 года: Компетентностную модель выпускника, паспорт образовательной программы, а также рабочий учебный план, каталог вузовского компонента (КВК) и каталог элективных дисциплин (КЭД).

В связи с открытием новой группы образовательных программ В265 – «Железнодорожный транспорт и технологии» были разработаны представленные на рассмотрение материалы. На кафедре «Автотранспортные средства и безопасность жизнедеятельности» было проведено заседание Академического комитета по образовательным программам и ведущих преподавателей кафедры с привлечением представителей работодателей и обучающихся для обсуждения структуры и содержания новой образовательной программы. По итогам обсуждения было вынесено положительное решение об их одобрении.

Представленные материалы были разработаны при участии работодателей, обучающихся и выпускников, с учётом требований нормативных правовых актов. Рабочий учебный план и КЭД для приёма 2025 года составлены и согласованы с работодателями.

ПОСТАНОВИЛИ:

1. Утвердить представленную новую образовательную программу «6В07184– Инженерия строительных и путевых машин» для поступления в 2025 году, включая Компетентностную модель выпускника, КЭД, КВК, рабочий учебный план и паспорт образовательной программы.
2. Представить указанные документы для рассмотрения и утверждения на Учёном Совете Академии.

Председатель УМБ ИТиС

Секретарь УМБ ИТиС



Абдрешов Ш.А.

Мурзалина Г.Б.

APPROVAL SHEET

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15. CHANGES REGISTRATION SHEET

№	Section, paragraph document	Type of change (replace, cancel, add)	Number and date notices	Change made	
				Date	Surname and initials, sig- nature, position