Joint stock company "Mukhametzhan Tynyshbayev ALT University"

APPROVE
US ALT decision dated
"12" 05 2025 (Protocol №9-1)
President-Rector
M.S.Zharmagambetova

EDUCATIONAL PROGRAM

Name: «6B07187 - ENGINEERING MANAGEMENT OF THE CARRIAGE COMPLEX »

Level of training: Bachelor's degree

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

Group of educational programs: B265 - Rail transport and technology

Date of registration in the Registry: 30.06.2025
Registration number: 6B07100155

Almaty, 2025

CONTENT

1. INFORMATION ABOUT CONSIDERATION, APPROVAL AND APPROVAL OF THE PROGRAM, DEVELOPERS, EXPERTS AND REVIEWERS (6B07187- EMWC, 2025)

1 DEVELOPED:

Associate Professor, c.t.s.	Ivanovtseva N.V.
Acting Head of the Department of "RS", c.t.s.	Chigambaev T.O.
Professor, d.t.s.	Solonenko V.G.
Associate Professor, d.t.s.	Musaev J.S.
Associate Professor, c.t.s.	Ashirbaeva I.A.
Assistant Professor, c.t.s.	Kibitova R.K.
Assistant Professor, c.t.s.	Suleeva N.Z.
Assistant Professor, c.t.s.	Turkebaev M.Zh.
Director of the branch "Wagon-wheel workshops of Almaty-1 station" of "Kamkor Wagon" LLP	Zhasokbai R.G.
Student, gr. B-22-1	Makhanbetova G.E.

2 EXPERTS:

General Director of Kazakhstan Associations of Carriers and operators of wagons (containers)	Adambaeva S.M.
General manager «Remvagon» LLP	Kadyrsizov S.U.

3 REVIEWERS:

Chief Engineer of the Almaty operational wagon depot of the branch of "KTZ-Freight transportation" LLP- "Almaty branch of FT"	Abubakirov R.E.

4 REVIEWED AND RECOMMENDED:

Meeting of the Academic Committee
of the Rolling Stock Department
Protocol № 1 *от «* 3 *»* 02 *2025 y.*

Chigambaev T.O.

Meeting of the Institute's EMB
transport and construction
Protocol № 90 *от «* 6 *»* 05 *2025 y.*

Abdreshov S.A.

EMC meeting ALT of the University named
after M.Tynyshpaevag
Protocol № 5 *от «* 6 *»* 05 *2025 y.*

Baigaraev N.A.

5 APPROVED by the decision of the Academic Council dated « 12 » 05 2025y. № 9-1

6 UPDATED Updating of the educational program in the Register on 30.06.2025.

2. REGULATORY REFERENCES

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

1. 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).

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

3. The sectoral qualifications framework of the field of "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 compulsory standard of higher and postgraduate education (order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2, with amendments and additions as of April 22, 2025).

5. 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.

6. 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 MES RK No. 152 dated 20.04.2011. (with additions and amendments dated April 04, 2023 No. 145).

7. Classifier of training areas with higher and postgraduate education, approved by the 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).

8. The algorithm of 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 amendments as of December 23, 2020 No. 536).

9. RI-ALT-33 "Regulations on the procedure for developing an educational program of higher and postgraduate education".

10. Professional standard "Technical operation, maintenance and repair of freight cars (station level)", NCE RK "Atameken", approved by Order No. 256 dated 20.12.2019.

11. Professional standard "Management and control of traffic safety in railway transport", NCE RK "Atameken", approved by Order No. 256 dated 20.12.2019.

12. Professional standard "Operation of wagons (containers)", NCE RK "Atameken", approved by Order No. 256 dated 20.12.2019.

13. Professional standard "Confirmation of conformity of railway transport", "Atameken", approved by order No. 270 dated 30.12.2019.

3. PASSPORT OF THE EDUCATIONAL PROGRAM

№	Field name	Note
1	Registration number	6B07100155
2	Code and classification of the field of education	6B07 Engineering, manufacturing and construction industries
3	Code and classification of training areas	6B071 Engineering and engineering trades
4	Code and group of educational programs	B265 - Rail transport and technology
5	Name of the educational program /	6B07187 - Engineering management of the carriage complex
6	EP type	New EP
7	EP purpose	Training of engineering and management personnel for the wagon complex, capable of designing, organizing and improving the processes of operation, maintenance and repair of wagons, ensuring its compliance with established requirements, using digital technologies, artificial intelligence tools, elements of scientific analysis and principles of sustainable development in the context of digital transformation of the transport industry.
8	ISCED level	*6*
9	Level on NQF	*6*
10	Level on SQF	*6*
11	Distinctive features of the EP	No
	Partner university (SUP)	No
	Partner university (DDEP)	-
12	Form of training	Full - time
13	Language of education	Kazakh, Russian, English
14	Volume of the credits	*241*
15	Degree to be conferred	Bachelor of Engineering and Technology in the educational program "6B07187 - Engineering management of the carriage complex " / Bachelor
16	Availability of an appendix to the license for the direction of training	KZ12LAA00025205 (005)
17	Availability of EP accreditation	
	Name of the accreditation body	
	Validity period of accreditation	

4. THE GRADUATE'S COMPETENCE MODEL

EP purpose: Training of engineering and management personnel for the wagon complex, capable of designing, organizing and improving the processes of operation, maintenance and repair of wagons, ensuring its compliance with established requirements, using digital technologies, artificial intelligence tools, elements of scientific analysis and principles of sustainable development in the context of digital transformation of the transport industry.

Objectives of the educational program:

1. Formation of a person capable of self-improvement and professional growth with diverse humanitarian and natural science knowledge and interests.
2. Formation of the ability to critically rethink the accumulated experience, change, if necessary, the profile of their professional activities, awareness of the social significance of their future profession, having a high motivation to perform professional activities.
3. Formation of the ability to find a compromise between various requirements (cost, quality, safety and deadlines) in long-term and short-term planning, to make optimal decisions in the field of operation, repair and maintenance of locomotives and wagons, their aggregates, systems and elements; to possess a culture of thinking.
4. Formation of the ability to generalize, analyze, perceive information, set goals and choose ways to achieve it.
5. Assistance in the formation of a graduate's readiness to: develop design documentation for the creation and modernization of locomotives and wagons; perform design work on the creation and modernization of rolling stock; develop technical documentation and methodological materials, proposals and measures for the creation and modernization of rolling stock.
6. Formation of graduates' readiness to conduct technical and economic analysis, comprehensive justification of the decisions taken and implemented in the field of operation and repair of rolling stock, their aggregates, systems and elements; application of the results in practice, striving for self-development, improving their qualifications and skills.
7. Assistance in the formation of graduates' readiness for the economical and safe use of natural resources, energy and materials during the operation, repair and maintenance of rolling stock (locomotives and wagons).

Educational outcome:

LR1. Synthesize socio-humanitarian, ethical and legal knowledge to form and convincingly present one's civic and professional position, promoting inclusivity and effective interaction in a team and professional environment, in the state, russian and a foreign language.

LR2. Formulate effective solutions for practical tasks in the professional field, based on the synthesis of natural science, physical and mathematical knowledge and principles.

LR3. Integrate modern information and communication systems, IT solutions and artificial intelligence tools to solve complex problems in transportation engineering.

LR4. Develop measures to ensure occupational safety, environmental protection and sustainable operation of the carriage complex, taking into account the requirements of the SDGs and regulatory requirements for the safety of products and processes.

LR5. Generate and implement engineering and management solutions based on the analysis of production and economic indicators aimed at improving efficiency, reducing losses, rational use of resources and reducing technological and managerial risks.

LR6. To design and model solutions to applied problems aimed at determining reliability parameters and strength characteristics of components and parts of rolling stock, using fundamental laws of mechanics, modern engineering approaches and elements of scientific research methods.

LR7. Substantiate the application of electrical and electronic systems in electrical equipment with an emphasis on innovative, energy-saving and renewable technologies.

LR8. Develop systems and models for predicting the technical condition of wagon assemblies, integrating digital platforms, advanced diagnostic methods and principles of scientific analysis to ensure safe operation and confirm compliance with requirements.

LR9. Design and improve the processes of repair and maintenance of wagons, including the development of appropriate technical documentation, using digital solutions, automation and evidence-based approaches to quality management.

LR10. Develop comprehensive management strategies and proposals based on the analysis of wagon operation data aimed at improving efficiency, ensuring compliance with regulatory requirements, sustainable development, transport safety and digital transformation of the industry.

Field of professional activity: Railway transport, transport equipment and technologies.

Objects of professional activity:

Local executive authorities in the field of railway transport and their regional structures;

Organizations and enterprises of the transport industry in the field of management, operation, maintenance, repair of rolling stock, urban rail transport and subways, as well as industrial transport;

Organizations and enterprises of the transport industry in the field of technologies of material processing production during maintenance, repair of rolling stock, 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 railway rolling stock, control over safe operation;

2) Development and implementation of technological processes of maintenance and repair, the use of standard methods for calculating the reliability of rolling stock elements.

3) Management of production processes, analysis of the results of production activities;

4) Management of works on inspection and repair of rolling stock;

5) Quality control of all types of rolling stock repairs, control of the availability, condition and use of control and measuring instruments;

6) Analysis and evaluation of production and non-production costs or resources for high-quality maintenance and planned types of repairs.

7) Development of new technologies, development of design and technological documentation using computer technologies;

8) Calculation of strength and stability under various types of loading, development of machine designs using methods and fundamentals of design, selection of materials for the manufacture of machine parts, justification of technical solutions;

9) Development of technical specifications and specifications for projects of railway wagons or their components, technological processes, automation tools using information technologies and computer programs;

10) Design of new samples of railway rolling stock, their components, aggregates, equipment, technological processes corresponding to the latest achievements of science and technology, safety requirements.

List of specialist positions: master of a section (workshop) of a wagon depot; engineer; repair engineer; engineer of the technical department; specialist in non-destructive testing, specialist in operational management of a team for the repair and maintenance of wagons; mechanic of a refrigerated wagon; specialist in electrical installations; train electrician.
And also according to the approved Professional Standards:

- Head of the operational car depot;
- Deputy Head of the operational car depot;
- Chief engineer of the operational car depot;
- Leading engineer of the operational car depot;
- Instructor of industrial training of the point of maintenance of wagons;
- Process engineer of the first category of the production department;
- Car receiver;
- Manager for providing customers with wagons (containers);
- Manager for the management of wagons (containers);
- Railway Rolling Stock Engineer;
- Regional Traffic Safety Auditor;
- Head of the Railway Traffic Safety Service;
- Traffic Inspector (by levels);
- Chief Traffic Safety Engineer (by levels).

Professional certificates received at the end of training: A locksmith for the repair of wagons, a conductor of a passenger car.

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;
- production (pre-graduate).

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.

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 internship 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 the bachelor's professional activity in a particular production; formation of a professional position of a specialist, 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/industrial practice.

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 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 integrated 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 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									
			LR1	LR2	LR3	LR4	LR5	LR6	LR7	LR8	LR9	LR10
1	2	3	4	5	6	7	8	9	10	11	12	13
1	History of Kazakhstan	5	LR1									
2	Philosophy	5	LR1									
3	Foreign language	10	LR1									
4	Kazakh (Russian) language	10	LR1									
5	Information and communication technologies	5			LR3							
Socio-political knowledge module		8										
6	Sociology	2	LR1									
7	Cultural studies	2	LR1									
8	Political Science	2	LR1									
9	Psychology	2	LR1									
10	Physical Culture	8	LR1									
Module of the component of choice GED		5										
11	Environmentally sustainable technologies					LR4						
12	Green economy and sustainable entrepreneurship					LR4	LR5					
13	Fundamentals of financial literacy						LR5					
14	Digital inclusion		LR1									
15	Fundamentals of scientific research							LR6				
16	Basics of law and anti-corruption culture		LR1									
17	Engineering Mathematics 1	5		LR2								
18	Engineering Mathematics 2	5		LR2								
19	Applied Physics	5		LR2								
20	Theoretical mechanics	4		LR2				LR6				
21	Structural materials in transport engineering	4		LR2				LR6				
22	Electrical engineering and the basics of electronics	6		LR2					LR7			
23	Occupational health and safety	5				LR4						
24	Machine parts and design basics	5		LR2				LR6				
25	Engineering graphics and computer modeling	4			LR3			LR6				
26	Python pogramming basics	3			LR3							
27	Professionally oriented foreign language	3	LR1									
28	Educational Practice	2			LR3		LR5		LR7	LR8		

№	Name of the discipline	Number of credits	Matrix of correlation of learning outcomes according to the educational program with academic disciplines									
			LR1	LR2	LR3	LR4	LR5	LR6	LR7	LR8	LR9	LR10
29	The future of rail transport and its importance for sustainable development	4					LR5					
30	Engineering profession in the railway industry of the future						LR5					
31	Heat engineering	4		LR2								
32	Fluid and gas mechanics, hydroand pneumatic drive			LR2								
33	Fundamentals of calculating the strength of machines and mechanisms	5						LR6				
34	Applied mechanics			LR2				LR6				
35	Rolling stock and railway infrastructure	6					LR5					LR10
36	Transport equipment and means of mechanization							LR6				LR10
37	Technical diagnostics of wagons	6								LR8	LR9	
38	Methods of nondestructive control of the rolling stock									LR8		LR10
39	Basics of technical operation of transport equipment	4					LR5					LR10
40	Transport safety and train traffic management systems						LR5					LR10
41	Electric machines and electric drive	6		LR2					LR7			
42	Electromagnetic technical means			LR2					LR7			
43	Digitalization of management processes and technical support of the wagon fleet	4			LR3					LR8		LR10
44	Automation of technological processes				LR3						LR9	
45	Dynamics of wagons	4			LR3			LR6				
46	IT technologies in transport				LR3							LR10

№	Name of the discipline	Number of credits	Matrix of correlation of learning outcomes according to the educational program with academic disciplines									
			LR1	LR2	LR3	LR4	LR5	LR6	LR7	LR8	LR9	LR10
1	2	3	4	5	6	7	8	9	10	11	12	13
47	Managerial Economics	3					LR5					
48	Time -management						LR5					
49	The basics of lean manufacturing	4					LR5					
50	Production organization and enterprise management						LR5					
51	Design of wagons	7						LR6				
52	Energy installations of transport equipment	5		LR2								LR10
53	Specialized rolling stock of the carriage fleet	4						LR6				LR10
54	Bases of reliability of the rolling stock	5						LR6				
55	Modern welding technologies in the repair of wagons	4				LR4					LR9	
56	Modern technologies for the repair of wagons	6					LR5				LR9	
57	Modern wagon automatic brakes and technological aspects of traffic safety	5						LR6				LR10
58	Operation and Maintenance of Railcars	6					LR5					LR10
59	Management of wagon complex enterprises	4					LR5				LR9	LR10
60	Production practice 1	5					LR5	LR6	LR7	LR8	LR9	LR10
61	Industrial practice 2/ Pre-graduate practice	5		LR2	LR3	LR4	LR5	LR6	LR7	LR8	LR9	LR10
62	Digital technologies and automation in the repair of wagons	5			LR3						LR9	
63	Digital engineering management				LR3		LR5					
64	Life support systems for passenger cars	5						LR6			LR9	
65	Information and documentation support for compliance and the life cycle of wagons									LR8	LR9	LR10
66	Design and calculation of components and parts of rolling stock	3			LR3			LR6				
67	Minor program 1		LR1									
68	Resource saving in transport	3					LR5		LR7			LR10
69	Minor program 2				LR3							
70	Technical regulation and legal aspects of rolling stock operation	3					LR5					LR10
71	Minor program 3						LR5					

6. STRUCTURE OF THE BACHELOR'S DEGREE PROGRAM

№	Name of cycles and disciplines	Total labor intensity	
		in academic hours	in academic credits
1	2	3	4
1	Cycle of 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
	Socio-political knowledge module (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 5280	At least 176
1)	University component and (or) optional component		
2)	Professional practice		
3	Additional types of training (ATT)		
1)	Component of choice		
4	Final certification	At least 240	At least 8
	Total	At least 7200	At least 240

7. WORKING CURRICULUM FOR THE ENTIRE DURATION OF TRAINING

JSC "Mukhametzhan Tynyshbayev ALT University"

Educational Plan

Form of study: full-time

Duration of study: 3 years

Admission: 2025 y.

Field of study:
6B071 Engineering and Engineering trades

Group of educational programs:
B 065 Transport equipment and technologies

Name of the educational program:
6B07187 - Engineering management of the carriage complex

Degree: Bachelor of Engineering and Technology

APPROVED
By the decision of the Scientific Council of ALT
from 12.05.2025. Protocol № 9-1

hairman of the Academic Council
Жармагамбетова М.С.

№	Discipline code	Name of cycles and disciplines	Total labor intensity		Form of control, semester		The amount of study load, hours						Distribution by semester									Securing the chair
								Contact information					1 course			2 course			3 course			
			in academic hours	in academic hours	Exam	CP (CW)	Total hours	lectures	practical	laboratory	IWSGT	IWS	1	2	3	4	5	6	7	8	9	
													10 week.	10 week.	10 week.	10 week.	10 week.	10 week.	10 week.	10 week.	10 week.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1.	CYCLE OF GENERAL EDUCATION DISCIPLINES (GED):																					
1.1.	Required component:		1530	51			1530	80	440	0	168	842	6	11	6	8	11	2	7	0	0	
M1	Module of general educational competencies																					
1.1.1.	23-0-B-OK-IK	History of Kazakhstan	150	5	5		150	20	20		8	102					5					SHD&PE
1.1.2.	23-0-B-OK-Fil	Philosophy	150	5	7		150	20	20		8	102							5			SHD&PE
1.1.3.	23-0-B-OK-FK	Physical education	240	8	1,2, 3,4		240		40		32	168	2	2	2	2						SHD&PE
M2	Language Competence Module																					
1.1.4.	23-0-B-OK-IYa	Foreign language	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	Kazakh (Russian) language	300	10	1,2, 3,4,5		300		100		40	160	2	2	2	2	2					LE
M3	Socio-political knowledge module																					
1.1.6.	23-0-B-OK-Sotz	Sociology	240	8	4,5,6, 7		240	5	10		8	37					2					SHD&PE
	23-0-B-OK-Kul	Culturology						5	10		8	37				2						SHD&PE
	23-0-B-OK-Pol	Political science						5	10		8	37							2			SHD&PE
	23-0-B-OK-Psi	Psychology						5	10		8	37						2				SHD&PE
M4	Information technology and artificial intelligence module																					
1.1.7.	23-0-B-OK-IKT	Information and Communication Technologies	150	5	2		150	20	20		8	102		5								ICT
1.2.	Component of choice:		150	5			150	20	20	0	8	102	0	0	0	0	0	5	0	0	0	
M5	The module of economic and managerial competencies																					
1.2.1.	25-0-B-KV-EUT	Environmentally sustainable technologies	150	5	6		150	20	20		8	102						5				MV&LS
	25-0-B-KV-ZEUP	Green economy and sustainable entrepreneurship																				TLM
	24-0-B-KV-OFG	Fundamentals of financial literacy																				TLM
	25-0-B-KV-CI	Digital inclusion																				ICT
	25-0-KV-ONI	Fundamentals of scientific research																				SHD&PE
	22-0-KV-OPAK	Basics of law and anti-corruption culture																				SHD&PE
	TOTAL FOR THE CYCLE OF GED:		1680	56			1680	100	460	0	176	944	6	11	6	8	11	7	7	0	0	
2.	THE CYCLE OF BASIC AND PROFILE DISCIPLINES(BD, PD):																					
2.1.	BASIC DISCIPLINES (BD):																					
2.1.1.	University component:		1530	51			1530	120	190	20	165	975	13	17	8	5	0	3	0	5	0	
M6	The module of natural science competencies																					
2.1.1.1	24-0-B-VK-IM1	Engineering Mathematics 1	150	5	1		150	10	20		15	105	5									GE
2.1.1.2	24-0-B-VK-IM2	Engineering Mathematics 2	150	5	2		150	10	20		15	105		5								GE
2.1.1.3	25-0-B-VK-PF	Applied Physics	150	5	2		150	10	10	10	15	105		5								GE
2.1.1.4	25-0-B-VK/KV-TMah	Theoretical mechanics	120	4	2		120	10	20		15	75		4								SE
M7	Professional module																					
2.1.1.5	25-0-B-VK-KMTM	Structural materials in transport engineering	120	4	1		120	20	10		15	75	4									MV&LS
2.1.1.6	25-0-B-VK-EOE	Electrical engineering and the basics of electronics	180	6	3		180	20	10	10	15	125			6							E
2.1.1.7	25-0-B-VK-OTBZhd	Occupational health and safety	150	5	8		150	10	20		15	105								5		MV&LS
2.1.1.8	25-0-B-VK-DMOK	Machine parts and design basics	150	5	4		150	20	10		15	105				5						MV&LS
M4	Information technology and artificial intelligence module																					
2.1.1.9	25-0-B-VK-IGKM	Engineering graphics and computer modeling	120	4	1		120	10	20		15	75	4									SE
2.1.1.10	25-0-B-VK-OPP	Python programming basics	90	3	2		90		10		15	65		3								ICT
M8	Practice-oriented module																					
2.1.1.11	25-0-B-VK-POIYa	Professionally oriented foreign language	90	3	6		90		40		15	35						3				LE
2.1.1.12	23-0-B-VK-UP	Educational Practice	60	2	3		60								2							RS
2.1.2	Component of choice:		1320	44	52	0	1320	120	160	30	150	860	4	0	15	0	6	3	4	12	0	
M7	Professional module																					
2.1.2.1	25-B-KV-BZhTZUR	The future of rail transport and its importance for sustainable development	120	4	1		120	10	20		15	75	4									RS
	25-B-KV-IPZhOB	Engineering profession in the railway industry of the future																				
2.1.2.2	25-0-B-KV-Tep	Heat engineering	120	4	3		120	10	10	10	15	75			4							RS
	25-0-B-KV-MGGGP	Fluid and gas mechanics, hydroand pneumatic drive																				
2.1.2.3	25-0-B-KV-ORPMM	Fundamentals of calculating the strength of machines and mechanisms	150	5	3		150	10	20		15	105			5							MV&LS
	25-0-B-KV-PM	Applied mechanics																				SE

2.1.2.4	25-B-KV-PSIGD	Rolling stock and railway infrastructure	180	6	3		180	20	20		15	125			6							RS
	25-0-B-KV-TTSM	Transport equipment and means of mechanization																				
2.1.2.5	25-B-KV-TDV	Technical diagnostics of wagons	180	6	5		180	10	10	20	15	125					6					RS
	25-B-KV-MNKPS	Methods of nondestructive control of the rolling stock																				
2.1.2.6	25-0-B-KV-OTETT	Basics of technical operation of transport equipment	120	4	6		120	20	10		15	75								4		MV&LS
	25-B-VK-TBiSUDP	Transport safety and train traffic management systems																				TLM
M4	Information technology and artificial intelligence module																					
2.1.2.8	25-B-KV-CPUTSVK	Digitalization of management processes and technical support of the wagon fleet	120	4	6		120	10	20		15	75								4		RS
	25-B-KV-ATP	Automation of technological processes																				
2.1.2.9	25-B-KV-DV	Dynamics of wagons	120	4	6		120	10	20		15	75								4		RS
	25-0-B-VK(KV)-ITTT	IT technologies in transport																				
M5	The module of economic and managerial competencies																					
2.1.2.10	23-0-B-UE	Managerial Economics	90	3	6		90	10	10		15	55						3				TLM
	23-0-B-KV-TM	Time -management																				
2.1.2.11	25-B-KV-OBP	The basics of lean manufacturing	120	4	7		120	10	20		15	75							4			RS
	25-B-KV-OPiMP	Production organization and enterprise management																				
	TOTAL for the BD cycle:		2850	95			2850	240	350	50	315	1835	17	17	23	5	6	6	4	17	0	
2.2.	THE CYCLE OF PROFILE DISCIPLINES (PD):																					
2.2.1.	University component:		1680	56	73	0	1680	90	130	90	135	935	0	0	0	7	10	9	15	6	9	
M7	Professional module																					
2.2.1.1	25-B-VK-KV	Design of wagons	210	7	4		210	10	20	20	15	145				7						RS
2.2.1.2	25-0-B-VK-EUTT	Energy installations of transport equipment	150	5	5		150	10	10	10	15	105					5					RS
2.2.1.4	25-B-KV-SPSVP	Specialized rolling stock of the carriage fleet	120	4	6		120	10	20		15	75						4				RS
2.2.1.5	25-B-VK-ONPS	Bases of reliability of the rolling stock	150	5	5		150	10	20		15	105					5					RS
M8	Practice-oriented module																					
2.2.1.1	25-B-VK-SSTRV	Modern welding technologies in the repair of wagons	120	4	7		120	10	10	10	15	75							4			RS
2.2.1.2	25-B-VK-STRV	Modern technologies for the repair of wagons	180	6	7		180	10	10	20	15	125							6			RS
2.2.1.6	25-B-VK-SAVTABD	Modern wagon automatic brakes and technological aspects of traffic safety	150	5	7		150	10	10	10	15	105							5			RS
2.2.1.7	25-B-VK-ETOV	Operation and Maintenance of Railcars	180	6	6		180	10	10	20	15	125								6		RS
2.2.1.8	25-B-VK-UPVK	Management of wagon complex enterprises	120	4	9		120	10	20		15	75									4	RS
2.2.1.10	25-0-B-VK-PPr1	Production practice 1	150	5	6		150											5				RS
2.2.1.11	25-0-B-VK-PPr2/PdPr	Industrial practice 2/ Pre-graduate practice	150	5	9		150														5	RS
2.2.2	Component of choice:		750	25	43	0	750	70	70	20	90	500	0	0	0	6	0	5	3	3	8	
M4	Information technology and artificial intelligence module																					
2.2.2.1	25-B-KV-CTARV	Digital technologies and automation in the repair of wagons	150	5	9		150	10	10	10	15	105									5	RS
	25-B-KV-CIM	Digital engineering management																				
2.2.2.2	25-B-KV-SZPV	Life support systems for passenger cars	150	5	6		150	10	10	10	15	105						5				RS
	25-B-KV-IDOSZhCV	Information and documentation support for compliance and the life cycle of wagons																				
M7	Professional module																					
2.1.2.7	25-B-KV-EME	Electric machines and electric drive	180	6	4		180	20	20		15	125				6						RS
	25-B-KV-ETS	Electromagnetic technical means																				
M9	Sustainable development and standards in transportation engineering / The module of the additional educational program																					
2.2.2.3	25-B-KV-PRUDPS	Design and calculation of components and parts of rolling stock	90	3	7		90	10	10		15	55							3			RS
	24-0-B-KV-MN1	Minor program 1																				
2.2.2.4	25-0-B-KV-RT	Resource saving in transport	90	3	8		90	10	10		15	55								3		RS
	24-0-B-KV-MN2	Minor program 2																				
2.2.2.6	25-B-KV-TNPAEPS	Technical regulation and legal aspects of rolling stock operation	90	3	9		90	10	10		15	55									3	RS
	24-0-B-KV-MN3	Minor program 3																				
	TOTAL FOR THE CYCLE OF PD:		2430	81			2430	160	200	110	225	1435	0	0	0	13	10	14	18	9	17	
3.	Additional types of training																					
M10	The module of personal competencies																					
3.1	24-0-B-KV-DVC-SO	Service to society	30	1	1		30		10		5	15	1									RS
	24-0-B-KV-DVC-BK	Business communications																				RS
	Total for theoretical training:		6960	232	0	0	6960	500	1010	160	715	4214	23	28	29	26	27	27	29	26	17	
4.	23-0-B-VK-IA	FINAL CERTIFICATION	240	8																	8	RS
	TOTAL FOR THE ENTIRE PERIOD OF STUDY:		7230	241									24	28	29	26	27	27	29	26	25	

Agreed:
Acting Vice-Rector for Academic Affairs _____ Kojabergenova A.K.

Developed:
Director of the Institute of Transport and Construction
_____ Abdreshov S.A.
Acting Head of the "Rolling Stock" Department
_____ Chigambaev T.O.

8. CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAMS **6B07187 - Engineering management of the carriage complex**

Level of education: bachelor course **Time of study: 3 years** **Year of admission: 2025 y.**

Module	Cycle	Component	Name of the discipline	Total labor intensity		Semester	Learning outcome	Brief description of the discipline	Prerequisites	Post-requisites
				in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10	11
M6 - The module of natural science competencies	BD	UC	Engineering Mathematics 1	150	5	1	LR2	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 education in mathematics	BD and PD disciplines
	BD	UC	Engineering Mathematics 2	150	5	2	LR2	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.	Engineering Mathematics 1	BD and PD disciplines

1	2	3	4	5	6	7	8	9	10	11
M6 - The module of natural science competencies	BD	UC	Applied Physics	150	5	2	LR2	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.	Basic school education in physics	BD and PD disciplines
	BD	UC	Theoretical mechanics	120	4	2	LR2, LR6	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, Applied Physics.	BD and PD disciplines

1	2	3	4	5	6	7	8	9	10	11
M7 - Professional module	BD	UC	Structural materials in transport engineering	120	4	1	LR2, LR6	Studies the structure, properties and labeling of metals and non-metallic materials, methods of their application and principles of processing materials by modern methods, classification of structural and raw materials, methods of testing materials, operational reliability and durability of transport equipment. Within the framework of the discipline, interactive teaching methods, the computational and graphical method are used.	Engineering Mathematics 1,2, Applied Physics	Machine parts and design basics, Applied mechanics, Energy installations of transport equipment, Construction of wagons, Rolling stock and railway infrastructure, Fundamentals of rolling stock reliability, Fundamentals of calculating the strength of machines and mechanisms, Methods of non-destructive testing of rolling stock.
	BD	UC	Electrical engineering and the basics of electronics	180	6	3	LR2, LR7	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 devices and circuits. Teaching methods - analysis of specific situational tasks, group discussions..	Engineering Mathematics 1,2, Applied Physics	Occupational safety and health, IT technologies in transport, Energy installations of transport equipment, Life support systems for passenger cars, Modern car brakes and technological aspects of traffic safety, Electric machines and electric drive / Electromagnetic technical means

1	2	3	4	5	6	7	8	9	10	11
M7 - Professional module	BD	UC	Occupational health and safety	150	5	8	LR4	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.	Electrical engineering and the basics of electronics, Applied physics, Environmental sustainable technologies, Modern technologies for the repair of wagons, Modern welding technologies in the repair of wagons, Electric machines and electric drive / Electromagnetic technical means	Management of wagon complex enterprises, Digital technologies and automation in the repair of wagons, Industrial (pre-graduate) practice 2, Final certification.
	BD	UC	Machine parts and design basics	150	5	4	LR2, LR6	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, Applied Physics, Structural materials in transport engineering, Theoretical mechanics, Fundamentals of calculating the strength of machines and mechanisms/ Applied Mechanics	Construction of wagons, Modern car brakes and technological aspects of traffic safety, Design and calculation of components and parts of rolling stock, Fundamentals of reliability of rolling stock, Power plants of transport equipment

1	2	3	4	5	6	7	8	9	10	11
M4 – Information technology and artificial intelligence module	BD	UC	Engineering graphics and computer modeling	120	4	1	LR3	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 education	Information and communication technologies, IT technologies in transport, Design and calculation of components and parts of rolling stock, Dynamics of wagons, Educational practice
	BD	UC	Python pogramming basics	90	3	2	LR3	The discipline studies the syntax and semantics of the Python language, algorithmizing 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.	Information and communication technologies	IT technologies in transport, Passenger car life support systems, Digital technologies and automation in the repair of wagons

1	2	3	4	5	6	7	8	9	10	11
M8 – Practice-oriented module	BD	UC	Professionally oriented foreign language	90	3	6	LR1	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	Production Practice 1,2, Final Certification
	BD	UC	Educational practice	60	2	3	LR3 LR5 LR7 LR8	The organization of educational practice is aimed at ensuring familiarization of bachelors with the main areas, objects, areas of professional activity and profiles of training and consolidation of theoretical material, as well as conducting study tours in the branch of the department for this educational program.	Engineering graphics and computer modeling, The future of railway transport and its importance for sustainable development / Engineering profession in the railway industry of the future	Disciplines of DB and PD cycles, Production practice 1,2
M7 - Professional module	PD	UC	Design of wagons	210	7	4	LR6	The design features, parameters and technical and economic indicators of freight and passenger wagons are studied, taking into account the principles of reliability, inclusion and environmental friendliness, based on regulatory and technical requirements. Strength calculation methods, digital design technologies and elements of artificial intelligence are used. They master the skills of optimizing structures, using specialized software and engineering analysis tools, in order to improve the technical characteristics of wagons and increase the efficiency of their use.	Applied Physics, Engineering Mathematics 1,2, Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics, Rolling stock and railway infrastructure / Transport equipment and mechanization tools	Energy installations of transport equipment, Fundamentals of reliability of rolling stock, Operation and maintenance of wagons, Modern technologies for repairing wagons, Technical diagnostics of wagons / Methods of non-destructive testing of rolling stock, Dynamics of wagons, Life support systems for passenger wagons, Specialized rolling stock of the wagon fleet

1	2	3	4	5	6	7	8	9	10	11
M7 - Professional module	PD	UC	Energy installations of transport equipment	150	5	5	LR2, LR10	Formation of knowledge about the purpose, structure and principle of operation of various types of power plants, processes occurring in their systems. Acquisition of skills of effective operation, ways to improve their basic technical, economic, energy and environmental indicators. Methods of calculation and experimental studies of power plants are considered, taking into account the requirements of their reliability, efficiency and environmental protection.	Electrical engineering and the basics of electronics, Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics, Thermal engineering/ Mechanics of liquid and gas, hydraulic and pneumatic drive, Rolling stock and railway infrastructure / Transport equipment and means of mechanization, Construction of wagons	Fundamentals of rolling stock reliability, Passenger car life support systems
	PD	UC	Specialized rolling stock of the carriage fleet	120	4	6	LR6, LR10	The discipline is devoted to the study of the design, operation and maintenance features of specialized wagons. Technologies for improving transportation efficiency, diagnostic methods, and condition monitoring are considered. The skills of analyzing the operational reliability of wagons are mastered, environmental aspects and innovative solutions for reducing environmental impact and resource conservation are taken into account.	Theoretical mechanics, Rolling stock and railway infrastructure/ Transport equipment and means of mechanization, Wagon construction	Modern welding technologies in the repair of wagons, Modern technologies for the repair of wagons, Operation and maintenance of wagons, Industrial, (pre-graduate) practice 2, Final certification
	PD	UC	Bases of reliability of the rolling stock	150	5	5	LR6	Formation of skills in forecasting reliability indicators of railway rolling stock parts and assemblies. The main provisions of the theory of reliability of rolling stock are studied; reliability indicators, methods and practical examples of their calculation; methods for calculating the reliability of complex systems, testing the reliability of rolling stock equipment; issues of ensuring the required level of reliability, analyzing the reliability of rolling stock equipment in operation. Interactive teaching methods are used, as well as elements of dual learning.	Electrical engineering and the basics of electronics, Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics, Wagon construction, Power plants of transport equipment, Rolling stock and railway infrastructure / Transport equipment and means of mechanization, Fundamentals of calculating the strength of machines and mechanisms / Applied mechanics.	Modern car brakes and technological aspects of traffic safety, Operation and maintenance of wagons, Modern technologies of wagon repair, Production practice 1, Industrial (pre-graduate) practice 2, Final certification

1	2	3	4	5	6	7	8	9	10	11
M8 - Practice-oriented module	PD	UC	Modern welding technologies in the repair of wagons	120	4	7	LR 4, LR 9	Modern welding and surfacing methods, including automated and digital technologies used in the repair of wagons, are being studied. Special attention is paid to welding equipment that ensures high accuracy, quality, compliance of joints with regulatory requirements and process control. Competencies are being formed in the selection of technological solutions, taking into account resource conservation, reliability, SDG requirements and technical documentation requirements. The efficiency of welding processes, their impact on the timing of work and the stability of operational characteristics are analyzed.	Construction of wagons, Electric machines and electric drive / Electromagnetic technical means.	Operation and maintenance of wagons, Digital technologies and automation in the repair of wagons, Digitalization of management processes and technical support of the wagon complex /Automation of technological processes, Labor protection and safety of life, Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Modern technologies for the repair of wagons	180	6	7	LR5 LR9	The skills of developing and optimizing rational technological processes for the repair of wagons using digital technologies are being mastered. The discipline's content meets regulatory and technical requirements and includes quality control, diagnostics, and node repair. Management competencies are being formed to increase efficiency, reduce risks and ensure the reliability of wagon repairs. The following are used: laboratory diagnostic equipment and tools; interactive teaching methods; elements of dual training.	Wagon design, Fundamentals of rolling stock reliability, Technical diagnostics of wagons / Methods of non-destructive testing of rolling stock	Operation and maintenance of wagons, Management of enterprises of the wagon complex, Digital technologies and automation in the repair of wagons, Digitalization of processes of management and technical support of the wagon complex /Automation of technological processes, Labor protection and safety of life, Industrial (pre-graduate) practice 2, Final certification

1	2	3	4	5	6	7	8	9	10	11
M8 - Practice-oriented module	PD	UC	Modern wagon automatic brakes and technological aspects of traffic safety	150	5	7	LR6 LR10	Skills are being developed in the use, diagnosis and analysis of malfunctions of the braking equipment of wagons, calculations of train brakes, assessment of reliability criteria, safety and compliance with technical regulations. The content is based on regulatory requirements and aspects of transport safety. Solutions for improving the reliability of braking systems in the context of digitalization of rolling stock operation management are being considered. The following methods are used: laboratory training complex for brake control; interactive teaching methods; elements of dual training.	Machine parts and design fundamentals, Electrical engineering and electronics fundamentals, Rolling stock and railway infrastructure, Fundamentals of rolling stock reliability	Fundamentals of technical operation of transport equipment / Transport safety and train traffic control systems , Operation and maintenance of wagons, Production practice 1, Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Operation and Maintenance of Railcars	180	6	8	LR5 LR10	The methods of organizing the operation and maintenance of wagons based on regulatory and technical requirements and reliability indicators are being studied. Competencies are being formed in the management of operational processes, the calculation of rolling stock utilization indicators and the assessment of production efficiency. The emphasis is on risk analysis, ensuring transport safety, sustainable development and maintaining the compliance of wagons with established standards during operation. Interactive teaching methods are used, as well as elements of dual learning.	Wagon design, Fundamentals of rolling stock reliability, Modern car brakes and technological aspects of traffic safety, Technical diagnostics of wagons / Methods of non-destructive testing of rolling stock, Modern technologies for repairing wagons, Life support systems for passenger wagons, Information and documentation support for compliance and the life cycle of wagons	Management of wagon complex enterprises, Industrial (pre-graduate) practice 2, Final certification

1	2	3	4	5	6	7	8	9	10	11
M8 - Practice-oriented module	PD	UC	Management of wagon complex enterprises	120	4	9	LR5 LR9 LR10	The skills of strategic and operational management of wagon complex enterprises are being developed, taking into account digitalization, safety requirements, environmental friendliness and sustainable development. The methods of analyzing production and economic indicators, quality management, reducing losses and risks, as well as interpreting operational data for the development of management solutions aimed at improving efficiency and resource conservation are being studied. Case methods, regulatory documents, and elements of dual and practice-oriented learning are used.	Digitalization of processes of management and technical support of the carriage complex/ Automation of technological processes, IT technologies in transport, Operation and maintenance of wagons, Fundamentals of technical operation of transport equipment, Modern technologies for repairing wagons, Labor protection and safety of life, Information and documentation support for compliance and the life cycle of wagons	Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Production practice 1	150	5	6	LR5-LR10	The main objectives of the industrial practice are: consolidation of theoretical knowledge and practical skills on the chosen educational program in a production environment, gaining experience in organizational work, obtaining a working specialty, the formation of practical skills and competencies in the process of mastering the bachelor's program.	Basic and profile disciplines of the OP, Educational practice	Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Production practice 2	150	5	9	LR2-LR10	The purpose of the practice for bachelors is to ensure the relationship between the theoretical knowledge acquired during the acquisition of the chosen educational program and practical activities. The objectives of this practice are to consolidate and deepen the theoretical knowledge acquired by students in the course of training, collecting information for writing the final qualification work, the study of best practices in the enterprise, as well as gaining experience in independent research work, mastering a variety of methods of scientific work.	Profile disciplines of the OP, Educational practice, Production practice 1	Final certification
			Total	**3210**	**107**					

9. CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

AGREED
Deputy Head of production of the Almaty operational locomotive depot of the branch of LLP "KTZ-Freight transportation" - "Almaty branch of FT"
_____ **Iskakov M.S.**
«___» _____ **2025 y.**

APPROVED
Director of the Institute
" Transport and construction "
_____ **Abdreshov Sh.A.**
«___» _____ **2025 y.**

CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAMS **6B07187 - Engineering management of the carriage complex**

Level of education: bachelor course **Time of study: 3 years** **Year of admission: 2025 y.**

Module	Cycle	Component	Name of the discipline	Total labor intensity		Semester	Learning outcome	Brief description of the discipline	Prerequisites	Post-requisites	Department
				in academic hours	in academic credits						
1		3	4	5	6	7	8	9	10	11	12
M5 - Module of economic and managerial competencies	GED	EC1	Ecological sustainable technologies	150	5	6	LR4	Discipline "Ecological sustainable technologies". technologies" studies modern methods and innovative solutions aimed at minimizing the negative impact of human activities on the environment. The course covers the principles of sustainable development, energy saving technologies, renewable energy sources, waste management strategies and environmentally friendly production processes.	Applied Physics, Engineering Mathematics 1,2	Occupational safety and health, Industrial practice 1,2, Final certification	MV &LS
	GED	EC2	Green economy and sustainable entrepreneurship				LR4 LR5	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 covers green economy concepts, ESG (Environmental, Social, Governance) approaches, circular economy, sustainable business models and their impact on global markets.	Engineering Mathematics 1,2, Sociology, Cultural Studies, Political Science, Psychology, History of Kazakhstan	Managerial Economics / Time Management, Production practice 1,2, Final certification	TLM

1	2	3	4	5	6	7	8	9	10	11	12
M5 - Module of economic and managerial competencies	GED	EC3	Fundamentals of Financial Literacy	150	5	6	LR5	The discipline is aimed at developing the ability to make informed financial decisions, plan income and expenses, assess risks and effectively manage their resources in a market economy. Studies basic knowledge in the field of finance and rational money management, discusses the concepts of the financial system, budget, banking products, lending, savings, investment, insurance, taxation and protection against financial fraud	Engineering Mathematics 1,2	Managerial economics / Time management, Production practice 1,2, Final certification	TLM
	GED	EC4	Digital inclusion				LR1	RO3 discipline "Digital Inclusion" is dedicated to studying 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 to overcome them, technologies for adapting the digital environment, and government initiatives to develop an inclusive digital society.	Applied Physics, Engineering Mathematics 1,2, Sociology, Cultural Studies	IT technologies in transport, Production practice 1,2, Final certification	ICT
	GED	EC5	Fundamentals of scientific research				LR6	The discipline introduces the basics of scientific activity, covering its goals, methods and forms, contributing to the formation of theoretical knowledge and practical skills necessary for the successful conduct of scientific research in a chosen professional field, as well as developing the ability to independently search, analyze and apply scientific information, which becomes an important basis for further research and professional activities	Applied Physics, Engineering Mathematics, Theoretical Mechanics	Dynamics of wagons, Digitalization of processes of management and technical support of the wagon complex, Automation of technological processes	SHD &PE
	GED	EC6	Fundamentals of law and anti-corruption culture				LR1	The discipline sets out the fundamental concepts of law, the constitutional structure of 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 if they are violated. The discipline provides students with an increase in public and individual legal awareness and legal culture, as well as a system of knowledge and civic position on combating corruption as an anti-social phenomenon.	Sociology, Cultural Studies, Political Science, Psychology, History of Kazakhstan	Production practice 1,2, Final certification	SHD &PE

1	2	3	4	5	6	7	8	9	10	11	12
M7-Professional module	BD	EC	The future of rail transport and its importance for sustainable development	120	4	1	LR5	The discipline forms the idea of railway transport as a strategically important industry that promotes sustainable development, territorial integration and social mobility. The key components of the transport system, its importance for the economy and society, historical stages and modern vectors of development are studied. The key digital and technological transformations of the industry, the role of the engineer of the future, and the importance of engineering thinking and management in the context of ensuring safety and meeting future requirements are considered.	Basic school education	Disciplines of PD, Educational practice	RS
	BD	EC	Engineering profession in the railway industry of the future				LR5	The course is aimed at forming a holistic image of the profession of an engineering manager in the field of railway transport enterprises. The key trends of the industry are being studied: digitalization, transition to green energy, artificial intelligence. Through real success stories, professional tasks, role-playing cases and analysis of global challenges, students form a vision of their career and the value of technical thinking and an understanding of responsibility for compliance of engineering solutions with ethical and legal standards.	Basic school education	Disciplines of PD, Educational practice	RS
	BD	EC1	Heat engineering	120	4	3	LR2	Studies the basics of heat generation, conversion, transmission and use, thermodynamic cycles of heat engines and calculation of their parameters, types of heat exchange, heat exchangers and methods of their calculation, the principle of operation and design features of heat power plants, heat-using machines, aggregates, and devices. The discipline contributes to the analysis of energy-saving technology in transport and the determination of trends in the development of heat engineering machines, equipment, installations and devices.	Applied Physics, Engineering Mathematics 1,2,	Energy installations of transport equipment, Life support systems for passenger cars	RS
	BD	EC2	Mechanics of liquid and gas, hydraulic and pneumatic drive				LR2	He studies the general laws and equations of fluid dynamics, modes of fluid motion and the basics of hydrodynamic similarity, laminar and turbulent fluid motion, hydraulic resistances, fluid flow through holes and nozzles, hydraulic calculation of pipelines, volumetric hydraulic machines, hydraulic drives and hydraulic automatics, pneumatic drive, pneumatic motor, pumps, hydraulic motors, fans, hydrodynamic gears, hydraulic drives metal cutting tools. The teaching methods are: problem solving, conducting thematic surveys, open and closed tests.	Applied Physics, Engineering Mathematics 1,2,	Energy installations of transport equipment	RS

1	2	3	4	5	6	7	8	9	10	11	12
M7-Professional module	BD	EC1	Fundamentals of calculating the strength of machines and mechanisms	150	5	3	LR6	Studies the basics of the theory of mechanisms and machines, material resistance, calculation and design of general-purpose parts and assemblies widely used in machines to solve problems aimed at improving reliability It is necessary to ensure the reliability and durability of parts and assemblies in the design , construction and operation, using modern educational and information technologies. Active learning methods – performing individual calculation and graphic tasks.	Applied Physics, Engineering Mathematics 1,2, Theoretical Mechanics	Machine parts and design fundamentals, Fundamentals of rolling stock reliability	MV&LS
		EC2	Applied Mechanics				LR2, LR6	The discipline develops practical skills in applying the laws of theoretical mechanics and resistance of materials to calculate the strength, rigidity and stability of machine elements and engineering structures, as well as to analyze their movement and interaction under various types of loads, in order to further design of reliable and efficient technical systems.	Applied Physics, Engineering Mathematics 1,2, Theoretical Mechanics	Machine parts and design fundamentals, Fundamentals of rolling stock reliability	TS
	BD	EC1	Rolling stock and railway infrastructure	180	6	3	LR5 LR10	Formation of professional competencies in the field of design and operation of the railway rolling stock fleet in interaction with railway infrastructure objects.Regulatory and technical base regulating requirements for railway rolling stock and railway infrastructure elements; track and track equipment economy; electric power supply of railways; design features of locomotives and wagons; locomotive and wagon economy; rules of technical operation; automation, telemechanics and communication on railways; organization of transportation and train movement.	Applied Physics, Engineering Mathematics 1,2, Structural materials in transport engineering, Theoretical mechanics	Energy installations of transport equipment, Carriage design, Carriage dynamics, Fundamentals of rolling stock reliability, Modern car brakes and technological aspects of traffic safety, Fundamentals of technical operation of transport equipment / Transport safety and train traffic control systems, Specialized rolling stock of the carriage fleet	RS
		EC2	Transport equipment and means of mechanization				LR6 LR10	The discipline studies the principles of operation, design features of transport equipment and means of mechanization, the main technical, operational, traction and energy characteristics, the role and significance of technical operation of various types of transport equipment. The discipline uses interactive teaching methods, conducting thematic surveys.	Applied Physics, Engineering Mathematics 1,2, Theoretical Mechanics	Energy installations of transport equipment, Construction of wagons, Fundamentals of technical operation of transport equipment / Transport safety and train traffic control systems, Fundamentals of reliability of rolling stock, Specialized rolling stock of the wagon fleet.	MV&LS

1	2	3	4	5	6	7	8	8	10	11	12
M7-Professional module	BD	EC	Technical diagnostics of wagons	180	6	3	LR8	The discipline examines modern methods of technical diagnostics of components and parts of wagons: non-destructive testing, vibration diagnostics, thermography. Skills are being developed to assess the technical condition using equipment, interpret data to determine compliance. Malfunction risks are analyzed, solutions for effective repair planning are substantiated, taking into account safety requirements and regulatory documentation in the context of digital transformation and sustainable development.	Applied Physics, Engineering Mathematics 1,2, Structural materials in transport engineering, Construction of wagons	Modern technologies of repair of wagons , Operation and maintenance of wagons, Information and documentation support for compliance and the life cycle of wagons, Production practice 1, Industrial (pre-graduate) practice 2, Final certification	RS
		EC1	Methods of non-destructive testing of rolling stock				LR8, LR10	Study, analysis and classification of the causes of operational and technological defects of components and parts of rolling stock. Advanced methods of non-destructive testing and detection of rolling stock malfunctions are considered. Mastering and developing practical skills: working with modern diagnostic devices and flaw detectors; understanding and analyzing the results obtained. Training methods used: working with diagnostic equipment, group work, discussion.	Applied Physics, Engineering Mathematics 1,2, Structural materials in transport engineering, Construction of wagons	Modern technologies of repair of wagons , Operation and maintenance of wagons, Information and documentation support for compliance and the life cycle of wagons, Production practice 1, Industrial (pre-graduate) practice 2, Final certification	RS

1	2	3	4	5	6	7	8	9	10	11	12
M 7-Professional module	BD	EC1	Fundamentals of technical operation of transport equipment	120	4	8	LR5, LR10	Training of specialists who have the skills of professional activity in the field of technical operation of transport equipment in and the full use of machines and their maintenance in working condition in accordance with the nature of future work at a particular enterprise. The discipline covers the study of the following issues: operability and regularities of changes in the technical state of equipment; system of maintenance and repair of transport equipment; definition of standards; structure and resources of engineering and technical services; methods of decision-making in the management of maintenance and repair of transport equipment.	Rolling stock and railway infrastructure/ Transport equipment and means of mechanization, Modern car brakes and technological aspects of traffic safety	Management of wagon complex enterprises, Production (pre-graduate) practice 2, Final certification	MV&LS
		EC1	Transport safety and train traffic management systems				LR5, LR10	The discipline is devoted to the study of theoretical and practical aspects of ensuring safety in railway transport, as well as the principles of building and operating modern train traffic control systems. The course covers a wide range of issues related to the prevention of terrorist acts and other illegal activities, the protection of critical infrastructure, as well as ensuring train safety through the use of modern control systems.	Rolling stock and railway infrastructure/ Transport equipment and means of mechanization. Modern car brakes and technological aspects of traffic safety	Management of wagon complex enterprises, Production (pre-graduate) practice 2, Final certification	TLM

1	2	3	4	5	6	7	8	9	10	11	12
M 7-Professional module	PD	EC1	Electric machines and electric drive of modern control systems.	180	6	4	LR2 LR7	The processes of electromechanical energy conversion, principles of operation, characteristics and operational features of electric machines and electric drives are studied. Skills are being developed for: informed choice of electrical equipment with an emphasis on energy conservation, digitalization, compliance with standards and sustainable development; work with regulatory and technical documentation; modeling electromagnetic processes; developing technical justification for innovative engineering solutions and assessing their safety. Interactive methods and elements of dual learning are used.	Electrical engineering and the basics of electronics, Applied Physics	Labor protection and life safety, Passenger car life support systems	RS
		EC2	Electromagnetic technical mediationelements of dual training.				LR2 LR7	Studies the design, principle of operation, classification and characteristics of electrical machines and transformers for general industrial applications, equations of EMF, voltages, currents and torques, methods of starting and regulating the frequency of electric motors, physical working conditions, losses and efficiency. The discipline contributes to the analysis of technical solutions to improve performance and the application of engineering methods for calculating the parameters of electrical energy converters. Interactive teaching methods, case studies, problem solving, and test tasks are used.	Electrical engineering and the basics of electronics, Applied Physics	Labor protection and life safety, Passenger car life support systems	RS
M4-Module of information technologies and artificial intelligence	BD	EC1	Digitalization of management processes and technical support of the wagon fleet	120	4	8	LR3 LR8 LR10	The discipline introduces automated carriage management systems and digital solutions in the technical support of the carriage complex, including diagnostics, condition forecasting and visualization of processes. The skills of risk analysis, interpretation of operational data, and development of management decisions and process compliance control are mastered. Digital, analytical, and managerial competencies are being developed in the context of security, sustainable development, compliance with standards, and industry transformation.	Information and communication technologies, Fundamentals of scientific research, The basics of lean manufacturing / The organization of production and management of the enterprise, Modern technologies of repair of wagons, Modern welding technologies in repair of wagons	Management of wagon complex enterprises, Industrial (pre-graduate) practice 2, Final certification	RS
		EC1	Automation of technological processes				LR3 LR9	PO9 Competencies are formed in the field of design, implementation and maintenance of automated production control systems processes. The architecture and algorithms of automated systems, modeling and management of technical processes using specialized software are studied. Elements of AI for adaptive control are being mastered. The approach is focused on sustainable development through digitalization, energy efficiency, loss reduction and increased reliability of operational systems. Elements of scientific research methods are used: system analysis, modeling and justification of engineering solutions.	Information and communication technologies, Fundamentals of scientific research, Fundamentals of lean manufacturing / The organization of production and management of the enterprise, Modern technologies of repair of wagons, Modern welding technologies in repair of wagons	Management of wagon complex enterprises, Industrial (pre-graduate) practice 2, Final certification	RS

1	2	3	4	5	6	7	8	9	10	11	12
M4 - Module of information technologies and artificial intelligence	BD	EC1	Dynamics of wagons	120	4	8	LR3 LR6	The patterns of movement and fluctuations of wagons under various operating conditions, methods of stability analysis and traffic safety are studied. Competencies are being formed for calculating the dynamic characteristics of freight and passenger wagons using software tools (Mathcad, SolidWorks, Universal Mechanism), calculating applied problems of wagon dynamics based on AI algorithms. Elements of scientific research methods are used: system analysis, modeling and justification of engineering solutions.	Applied Physics, Engineering Mathematics 1,2, Engineering graphics and computer modeling, Construction of wagons, Information and communication technologies, Fundamentals of scientific research	Industrial (pre-graduate) practice 2, Final certification	RS
		EC2	IT technologies in transport				LR3, LR10	Studies the principles of forming information flows, managing information flows in transport systems of different levels of complexity, general principles of building intelligent transport systems (ITS), routing transport and monitoring its operation when using ITS, design of information systems, organization of information exchange between control objects, methods of automated identification of transport objects, methods of location determination, application of information technology in the design of vehicles.	Information and Communication Technologies, Fundamentals of Python Programming, Applied Physics, Engineering Mathematics 1,2, Electrical engineering and fundamentals of electronics, Engineering graphics and computer modeling	Management of wagon complex enterprises, Digital technologies and automation in the repair of wagons, Digital engineering management, Final certification	ICT
M5 - Module of economic and managerial competencies	BD	EC1	Managerial economics	90	3	6	LR5	Formation of the conceptual framework and development of economic analysis skills using modern models and patterns of economic science, consideration of economic problems and tasks facing the head of the company. Studying this discipline will allow students to gain and develop knowledge in the field of analytical research of economic, technological and technical parameters of the enterprise, as well as to master the skills of applying special methods of economic justification of management decisions and assessing their consequences.	Engineering Mathematics 1,2, Fundamentals of Financial Literacy, Green Economy and Sustainable Entrepreneurship	Fundamentals of lean manufacturing, Production organization and enterprise management, Digital engineering management	TLM
		EC2	Time management				LR5	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 the skills of organizing and optimizing the use of working time, increase productivity, reduce stress, plan, delegate, use tools and technologies, and know your time and energy rhythms in order to use your time effectively.	Engineering Mathematics 1,2, Fundamentals of Financial Literacy, Green Economy and Sustainable Entrepreneurship	Fundamentals of lean manufacturing, Production organization and enterprise management, Digital engineering management	TLM

1	2	3	4	5	6	7	8	9	10	11	12
M5 - Module of economic and managerial competencies	BD	EC1	The basics of lean manufacturing	120	4	7	LR5	The discipline builds an understanding of the principles of lean manufacturing for increased efficiency and sustainable development. The methods of identifying and eliminating losses, visualizing processes, standardization, and digitalization are being studied. Managerial and analytical competencies are being developed, including risk assessment and decision-making based on production and economic indicators, ensuring product quality and compliance with established requirements and approaches to resource optimization.	Managerial economics, Time management,	Digitalization of processes of management and technical support of the carriage complex / Automation of technological processes	RS
		EC2	Production organization and enterprise management				LR5	The discipline reveals the basics of the organization of production processes and enterprise management, taking into account modern requirements of sustainable development. Methods of planning, rationing, risk analysis, quality management, decision-making and ensuring compliance of products and processes with standards are mastered. Digital optimization tools, automation elements, production and economic indicators and approaches to increasing efficiency, reducing losses and rational use of resources in industrial practice are considered.	Managerial economics, Time management	Digitalization of processes of management and technical support of the carriage complex / Automation of technological processes	RS
M4 - Module of information technologies and artificial intelligence	PD	EC1	Digital technologies and automation in the repair of wagons	150	5	9	LR3, LR9	Digital technologies and automatic control systems used in the repair of wagons are being studied. Competencies for designing and optimizing technological processes are being formed, taking into account production efficiency, quality, sustainability and compliance of repair work with regulatory documentation. Automation methods, technologies for creating 3D models of necessary spare parts and their production, replacement of parts and maintenance are being mastered. Technological and managerial risks are analyzed. The following elements are used: scientific analysis, quality control, dual and interactive learning.	Information and communication technologies, IT technologies in transport, Basics of Python programming, Modern technologies for the repair of wagons, Modern welding technologies in the repair of wagons Labor protection and safety of life	Industrial (pre-graduate) practice 2, Final certification	RS
		EC2	Digital Engineering Management				LR3 LR5	Digital approaches to the management of engineering processes of the carriage and locomotive complex are being studied, including the analysis of operational data, modeling and risk assessment. Digital design, quality management, and resource management skills are being developed. Scientific analysis methods and digital platforms are used. The focus is on management decisions, efficiency improvement, sustainable development and digital transformation of the industry.	Information and communication technologies, IT technologies in transport, Managerial economics / Time management	Industrial (pre-graduate) practice 2, Final certification	RS

1	2	3	4	5	6	7	8	9	10	11	12
M4 - Module of information technologies and artificial intelligence	PD	EC1	Life support systems for passenger cars	120	4	7	LR6 LR9	Formation of skills of diagnostics and technical calculation of life support systems of passenger cars of various types, in order to determine their optimal characteristics, for rational practical application in operation. Study of: modern designs of life support systems for passenger cars, their rational technical and technological solutions; regulatory and technical documentation for maintenance and repair of life support systems for passenger cars. Interactive teaching methods, elements of dual training are used.	Information and communication technologies, Electrical engineering and fundamentals of electronics, Fundamentals of Python programming, Thermal engineering, Power plants of transport equipment, Electric machines and electric drive/ Electromagnetic technical means	Operation and maintenance of wagons, Industrial (pre-graduate) practice 2	RS
		EC2	Information and documentation support for compliance and the life cycle of wagons				LR8 LR9 LR10	Study of the regulatory and technical base and procedures for assessing the conformity of wagons. Competencies for working with technical, repair and accompanying documentation of the life cycle are being formed. The basics of conformity assessment and identification methods are considered. Information systems and digital tools for document management, compliance control, and information support for operation and repair are being mastered.	Information and communication technologies, Technical diagnostics of wagons / Methods of non-destructive testing of rolling stock	Operation and maintenance of wagons , Management of wagon complex enterprises, Industrial (pre-graduate) practice 2	RS

1	2	3	4	5	6	7	8	9	10	11	12
M9-Sustainable development and standards in transport engineering/Module of the additional educational	PD	EC1	Design and calculation of components and parts of rolling stock	90	3	7	LR3 LR6	PO3 PO6 PO8 Methods of engineering analysis, strength calculations and selection of materials for rolling stock components are mastered using modern CAD/CAE/CAM systems (SolidWorks, MathCAD, COMPASS-3D). Digital competencies are being developed in the field of parametric modeling, visualization and optimization of structures with an emphasis on resource conservation, environmental friendliness and the use of IT tools at all stages of the product life cycle. Elements of scientific research methods are used: system analysis, modeling and justification of engineering solutions.	BD and PD disciplines	Production practice, Final certification	RS
		EC2	Minor program 1				LR1	The first of three disciplines, which allows you to form additional professional competencies in various subject areas.	BD and PD disciplines	Production practice, Final certification	RS
		EC1	Resource saving in transport	90	3	8	LR5 LR7, LR10	Study of the main types and characteristics of energy resources, regulatory support for energy saving, improving the energy efficiency of the transportation process; energy-saving technologies in repair production and operation of transport infrastructure facilities; organization and methods of energy saving management. It is used to solve problems, conduct thematic colloquiums, debates. Guest lectures are being held by leading experts of the transport and communication industry.	BD and PD disciplines	Production practice, Final certification	RS
		EC2	Minor program 2				LR3	is the second of three disciplines that allows you to form additional professional competencies in various subject areas.	BD and PD disciplines	Production practice, Final certification	RS
		EC1	Technical rationing and legal aspects of rolling stock	90	3	9	LR5 LR10	Regulatory and legal bases for ensuring safe, efficient and environmentally sustainable operation of rolling stock are studied. Methods of technical regulation, risk assessment and legal regulation in the transport industry are being developed. Competencies are formed in the field of compliance with the requirements of technical documentation, standards and legislation. Approaches to sustainable life cycle management of railway rolling stock are analyzed.	BD and PD disciplines	Production practice, Final certification	RS
		EC2	Minor program 3				LR5	The third of the three disciplines, which allows you to develop additional professional competencies in various subject areas.	BD and PD disciplines	Production practice, Final certification	RS
			Total	**2220**	**74**						

10. EXPERT OPINIONS

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ
на образовательную программу (компетентностную модель выпускника, УП, КЭД) бакалавриата 6В07187 - Инженерный менеджмент вагонного комплекса по направлению подготовки 6В071-Инженерия и инженерное дело

Новая Образовательная программа бакалавриата 6В07187 – Инженерный менеджмент вагонного комплекса разработана в 2025 году со сроком обучения три года, что позволяет студентам быстрее завершать обучение, снизить финансовую нагрузку, а также оперативнее выходить на рынок труда, удовлетворяя потребности работодателей в специалистах, обладающих современными инженерными и управленческими компетенциями. В блоке «Цикл профилирующих дисциплин» добавлены новые дисциплины, отражающие современные тренды: «Техническая диагностика вагонов», «Цифровизация процессов управления и технического сопровождения вагонного комплекса», «Цифровой инженерный менеджмент». Компетентностная модель выпускника содержит актуальные для вагонного комплекса цели и задачи, и позволяет ответить на вопрос о том, какие профессиональные задачи должен уметь решать специалист в сфере организации, управления и совершенствования процессов эксплуатации, технического обслуживания и ремонта вагонов. Результаты обучения сформулированы лаконично, отражают объем и содержание программы, являются достижимыми в рамках учебной нагрузки.

Учебный план ОП 6В07187 – Инженерный менеджмент вагонного комплекса представлен как логическая последовательность освоения блоков общеобразовательных, базовых и профилирующих дисциплин, обеспечивающих формирование результатов обучения. Дисциплины вузовского компонента составляют фундаментальную базу знаний инженера, и в комплексе с дисциплинами компонента по выбору отражают требования к компетенциям разносторонне развитого, конкурентоспособного специалиста. Важная роль отводится практике: учебная практика после 1-го курса, производственная практика после 2-го курса и производственная (преддипломная) практика на 3-м курсе. Каждый вид практики подразумевает освоение соответствующих результатов обучения, что позволяет планомерно закреплять полученные на каждом этапе обучения теоретические знания. А преддипломная практика обеспечивает сбор информации для написания выпускной квалификационной работы.

Каталог элективных дисциплин содержит дисциплины, позволяющие углубленно освоить специфику инженерного менеджмента в вагонном хозяйстве. Содержательная часть профилирующих дисциплин, формирующих профессиональные результаты обучения, отработана с авторами ОП, направлена на формирование способности выпускников рационально организовывать производственные процессы, применять цифровые технологии для повышения эффективности, а также разрабатывать и внедрять мероприятия по обеспечению надёжности и безопасности подвижного состава.

Общая экспертиза образовательной программы (компетентностной модели выпускника, УП, КЭД) бакалавриата 6В07187 – Инженерный менеджмент вагонного комплекса, по группе образовательных программ В265 – Железнодорожный транспорт и технологии, свидетельствует о полноте охвата необходимых для будущего специалиста вагонного хозяйства результатов обучения, для освоения которых представлен перечень актуальных учебных дисциплин в совокупности с различными видами практики.

Отдельно следует отметить, что представленная образовательная программа разработана с учётом действующих Профессиональных стандартов, опытным коллективом авторов с привлечением работодателей из сферы вагонного хозяйства.

На основании вышеизложенного, рекомендую внедрить в учебный процесс образовательную программу (компетентностную модель выпускника, УП, КЭД) бакалавриата 6В07187 – Инженерный менеджмент вагонного комплекса, по направлению подготовки кадров 6В071-Инженерия и инженерное дело.

Эксперт
Генеральный директор
Казахстанской Ассоциации перевозчиков и операторов вагонов (контейнеров) **Адамбаева С.М.**

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 6В07187 - Инженерный менеджмент вагонного комплекса
Уровень подготовки: бакалавриат
Группа образовательных программ: В265 – Железнодорожный транспорт и технологии
Направление подготовки: 6В071-Инженерия и инженерное дело

Новая ОП «6В07187 - Инженерный менеджмент вагонного комплекса», для новой группы образовательных программ «В265 – Железнодорожный транспорт и технологии», разработана в 2025 году с учётом современных потребностей в специалистах, обладающих как инженерными, так и управленческими компетенциями, и сокращением срока обучения до трёх лет. Такое сокращение стало возможным благодаря оптимизации учебного процесса и внедрению дисциплин, соответствующих современным вызовам, связанных с цифровизацией процессов, технической диагностикой, основами бережливого производства и цифровым инженерным менеджментом. Это решение позволяет выпускникам быстрее адаптироваться к реальным задачам, актуальным для профильных предприятий отрасли.

Представленная ОП носит актуальный характер, так как разработана с целью подготовки конкурентоспособных специалистов вагонного хозяйства, обладающих разносторонними естественно-научными и профессиональными компетенциями в соответствии с действующими на данный момент профессиональными стандартами, регламентирующими процессы эксплуатации, технического обслуживания и ремонта вагонов.

ОП «6В07187 - Инженерный менеджмент вагонного комплекса» разработана на основе актуальных НПА МНВО РК, состоит из следующих основных блоков: паспорт ОП, компетентностная модель выпускника, учебный план, каталог дисциплин вузовского компонента (КВК), каталог элективных дисциплин (КЭД). Содержание всех блоков соответствует заявленной цели ОП и уровню образования по требованиям НРК и ОРК.

Представлены КВК и КЭД, в которых содержание дисциплин охватывает заявленные результаты обучения и отражает современное состояние развития вагонного комплекса и технологий его обслуживания. Особо следует отметить включение таких прогрессивных дисциплин, как «Цифровизация процессов управления и технического сопровождения вагонного комплекса» и «Цифровой инженерный менеджмент», которые готовят специалистов к работе в условиях цифровой трансформации отрасли. Изучение дисциплин образовательной программы позволит овладеть знаниями в области эксплуатации и ремонта вагонов, их агрегатов и систем, позволит приобрести навыки решения профессиональных вопросов на основе принципов безопасности, ресурсосбережения и анализа производственно-экономических показателей. Дисциплины профилирующего блока помогут обучающимся овладеть профессиональными компетенциями в практической инженерно-управленческой деятельности на базе современных подходов к решению задач, оценки надёжности, принципов автоматизации и требований технических регламентов.

В ОП «6В07187 - Инженерный менеджмент вагонного комплекса» отражены основные трудовые функции в компетенциях и результатах обучения, указаны виды связей с работодателями: проведение гостевых лекций, лекций ведущих топ-менеджеров, наличие филиалов кафедры на базе профильных предприятий.

Представленная на экспертизу ОП «6В07187 - Инженерный менеджмент вагонного комплекса», её составляющие: компетентностная модель выпускника, учебный план, КВК, КЭД, полностью соответствуют требованиям НПА, имеют четкую последовательность при разработке, отвечают современным запросам рынка труда и профессиональным стандартам, рекомендуются к принятию и использованию в учебном процессе по направлению подготовки «6В071-Инженерия и инженерное дело».

ЭКСПЕРТ:
Генеральный директор ТОО «Ремвагон» **Кадырсизов С.У.**

11. REVIEWER'S CONCLUSION

РЕЦЕНЗИЯ
на образовательную программу 6В07187 - Инженерный менеджмент вагонного комплекса по направлению подготовки 6В071 Инженерия и инженерное дело Группа образовательных программ: В265 – Железнодороржный транспорт и технологии

На экспертизу представлена новая, разработанная в 2025 году образовательная программа бакалавриата 6В07187 - Инженерный менеджмент вагонного комплекса: компетентностная модель выпускника, рабочий учебный план на весь срок обучения (3 года), каталог дисциплин вузовского компонента, каталог дисциплин компонента по выбору.

Образовательная программа разработана с сокращением срока обучения с 4 лет до 3 лет, что обусловлено необходимостью оперативного пополнения кадрового состава отрасли квалифицированными специалистами. В условиях высокой потребности в инженерных кадрах, особенно в области эксплуатации подвижного состава, такой подход позволяет готовить выпускников в более сжатые сроки, не теряя при этом качества их подготовки. Внедрение практико-ориентированного обучения, включение в программу актуальных профессиональных дисциплин (Управление предприятиями вагонного комплекса, Цифровые технологии и автоматизация в ремонте вагонов, Информационно-документационное обеспечение соответствия и жизненного цикла вагонов) и концентрация на развитии ключевых компетенций позволяют выпускникам адаптироваться к реальным условиям работы сразу после окончания обучения. Это особенно важно для депо, где требуется быстрое внедрение специалистов в производственные процессы для обеспечения бесперебойной работы железнодорожного транспорта. Таким образом, сокращение срока обучения соответствует интересам как образовательного процесса, так и отрасли, обеспечивая удовлетворение потребностей в квалифицированных кадрах и ускоряя их вхождение в профессию.

В целом дисциплины учебного плана по рецензируемой образовательной программе формируют весь необходимый перечень общекультурных и профессиональных/управленческих компетенций, предусмотренных ГОСО по соответствующим видам деятельности. Соблюдена последовательность изучения дисциплин, 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 и Каталог вузовского компонента полностью отражают преемственность дисциплин.

Образовательная программа 6В07187 - Инженерный менеджмент вагонного комплекса предусматривает профессионально-практическую подготовку обучающихся. Рабочие программы учебных дисциплин и всех видов практик позволяют сделать вывод, что они соответствует компетентностной модели будущего выпускника, а также действующим профессиональным стандартам по соответствующим траекториям представленной ОП: «Подтверждение соответствия железнодорожного транспорта», «Техническая эксплуатация, обслуживание и ремонт грузовых вагонов (станционный уровень)», «Управление и контроль безопасности движения на железнодорожном транспорте», «Оперирование вагонами (контейнерами)».

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

Заключение: рецензируемая образовательная программа 6В07187 – «Инженерный менеджмент вагонного комплекса» отвечает основным требованиям ГОСО, национальной рамке квалификаций, отраслевой рамке квалификаций, профессиональных стандартов и способствует формированию общекультурных и профессиональных/управленческих компетенций по направлению подготовки 6В071 - Инженерия и инженерное дело, т.о. рекомендуется к принятию и использованию в учебном процессе АО «ALT Университет им. Мухамеджана Тынышпаева».

Рецензент
Главный инженер Алматинского
эксплуатационного вагонного депо — Абубакиров Р.Е.
17.02.2025

12. LETTERS OF RECOMMENDATION

Шынғар Транс

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Заведующему кафедрой
«Подвижной состав»,
АО «ALT Университет
им. Мухамеджана Тынышпаева»
Аширбаеву Г.К.

Уважаемый Галымжан Кожахатович!

Руководство ТОО «Шынгар Транс» в лице Председателя наблюдательного совета Е.К. Аутова ознакомилось с содержанием обновлённой образовательной программы «ОП 6В07137-Инженерия подвижного состава», с сокращённым сроком обучения до трёх лет, и предлагает следующие рекомендации для обновления ОП в 2025 году: включить в программу дисциплины, которые позволят студентам овладеть основами программирования и моделирования, изучить современные методы автоматизации и технической эксплуатации, а также углубить знания в области использования инженерных систем и технологий управления сложными объектами. Особое внимание стоит уделить формированию навыков, необходимых для работы с микроэлектронными системами и процессами, а также освоению компетенций в области эксплуатации систем, обеспечивающих безопасность и комфорт пассажиров. Данный подход не только повысит качество подготовки выпускников, но и обеспечит их готовность к решению реальных задач, связанных с использованием современных технологий и инженерных решений, что соответствует требованиям работодателей и способствует дальнейшему развитию отрасли.

В целом рекомендуем для использования в учебном процессе АО «ALT Университет им. Мухамеджана Тынышпаева» образовательную программу «ОП 6В07137-ИПС» для подготовки конкурентоспособных и высококвалифицированных специалистов руководящего и управленческого состава, реализующих в профессиональной деятельности аналитические и инженерно-технические способности, основанные на современных и ресурсосберегающих технологиях эксплуатации, технического, сервисного обслуживания и ремонта железнодорожного подвижного состава.

Президент Е. Аутов

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13. REVIEW AND APPROVAL PROTOCOLS

АО «ALT УНИВЕРСИТЕТ ИМЕНИ МУХАМЕДЖАНА ТЫНЫШПАЕВА»

ПРОТОКОЛ №1
Заседания
Академического комитета по ОП
«6B07187-Инженерный менеджмент вагонного комплекса»,
«6B07191-Инженерный менеджмент локомотивного комплекса»,
«6B07192-Подвижной состав железных дорог»
и ведущих преподавателей кафедры «Подвижной состав»

г. Алматы «3» февраля 2025 года

Председатель: и.о. зав кафедрой «ПС», к.т.н., Чигамбаев Т.О.
Секретарь: ассоц. профессор, к.т.н., Ивановцева Н.В.
Присутствовали:
Члены Академического комитета, ведущие ППС кафедры: Солоненко В.Г., Мусаев Ж.С., Бақыт Ғ.Б., Аширбаева И.А., Ивановцева Н.В., Утепова А.У., Кибитова Р.К., Джакупов Н.Р., Сүлеева Н.З., Туркебаев М.Ж.
Представители с производства - члены Академического комитета: Директор филиала «Вагоноколесные мастерские станции Алматы-1» ТОО «Қамқор Вагон» - Жасоқбай Р.Г.; заместитель начальника по производству Алматинского эксплуатационного локомотивного депо филиала ТОО «ҚТЖ-Грузовые перевозки» - «Алматинское отделение ГП» - Искаков М.С.
Обучающийся - член Академического комитета: студент гр. Л-22-2 Ташенова Д.К., студент гр. В-22-1 Маханбетова Г.Е.

ПОВЕСТКА ДНЯ:

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

По первому вопросу
СЛУШАЛИ: И.о. зав кафедрой «ПС», к.т.н., Чигамбаев Т.О. предложил рассмотреть подготовленные материлы для новых образовательных программ «6B07187-Инженерный менеджмент вагонного комплекса», «6B07191-Инженерный менеджмент локомотивного комплекса», «6B07192-Подвижной состав железных дорог», для включения в реестр.

Членами АК при разработке новых ОП по ОП «6B07187-Инженерный менеджмент вагонного комплекса», «6B07191-Инженерный менеджмент локомотивного комплекса» и «6B07192-Подвижной состав железных дорог», была проведена следующая работа:

1) исследование сферы профессиональной деятельности;

2) выявление профессионально значимых компетенции, с акцентом на управленческие компетенции;

3) обсуждение АК (мнения стейхолдеров). Проведён анализ рекомендаций потенциальных стейхолдеров; формирование РО совместно со стейхолдерами на основе детализации компетенций. В АК включены представители стейхолдеров - Директор филиала «Вагоноколесные мастерские станции Алматы-1» ТОО «Қамқор Вагон» - Жасоқбай Р.Г.; заместитель начальника по производству Алматинского эксплуатационного локомотивного депо филиала ТОО «ҚТЖ-Грузовые перевозки» - «Алматинское отделение ГП» - Искаков М.С.

4) определение взаимосвязи РО и критериев оценки. Установлена структура оценки на основе освоения дисциплин, прохождения производственной практики, защиты дипломной работы.

Отметил актуальность введения новых ОП ОП «6В07187-Инженерный менеджмент вагонного комплекса», «6В07191-Инженерный менеджмент локомотивного комплекса», «6В07192-Подвижной состав железных дорог»:

1. Стратегическая значимость отрасли. Железнодорожный транспорт — ключевой элемент экономики, требующий высококвалифицированных специалистов для модернизации и надежной эксплуатации подвижного состава.

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 в эксплуатации, ремонте и управлении подвижным составом.

4. Практическая направленность. Формат обучения в 3 года позволяет быстро подготовить кадры, ориентированные на решения текущих задач отрасли, с акцентом на практическую деятельность.

5. Устойчивое развитие. Программа ориентирована на внедрение экологически чистых технологий и повышение энергоэффективности в железнодорожной отрасли.

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

Введение новых ОП «6В07187-Инженерный менеджмент вагонного комплекса», «6В07191-Инженерный менеджмент локомотивного комплекса» и «6В07192-Подвижной состав железных дорог» позволит оперативно ответить на потребности рынка труда, укрепить образовательный потенциал и обеспечить развитие железнодорожной отрасли.

Кроме того, образовательная программа бакалавриата «6В07192-Подвижной состав железных дорог» разработана совместно с ОмГУПС (РФ)). Применение модели двух дипломов в партнерстве с Омским государственным университетом путей сообщения (РФ) представляет собой своевременное и перспективное решение.

ВЫСТУПИЛА: Член АК, ассоциированный профессор кафедры «Подвижной состав» Ивановцева Н.В., которая представила материалы подготовленные для новых ОП ОП «6В07187-Инженерный менеджмент вагонного комплекса», «6В07191-Инженерный менеджмент локомотивного комплекса» и «6В07192-Подвижной состав железных дорог»:

- анализ по ВУЗам;
- предложение наименование 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.

5) **ВЫСТУПИЛ**: Представитель работодателей, член АК ОП бакалавриата: «6В07187-Инженерный менеджмент вагонного комплекса», директор филиала «Вагоноколесные мастерские станции Алматы-1» ТОО «Қамқор Вагон» Жасоқбай Р.Г., который отметил, актуальность предсавленных материалов и своевременость ввдения

дисциплин блока ПД, особенно связанных с освоением управленческих компетенций и современных цифровых технологий ремонта и технического обслуживания вагонов.

ВЫСТУПИЛ: Представитель работодателей, член АК ОП бакалавриата: «6В07191-Инженерный менеджмент локомотивного комплекса» и «6В07192-Подвижной состав железных дорог», заместитель начальника по производству Алматинского эксплуатационного локомотивного депо филиала ТОО «ҚТЖ-Грузовые перевозки» - «Алматинское отделение ГП» Искаков М.С., отметил актуальность и практическую значимость введения дисциплин блоков БД и ПД, в частности отметил актуальность дисциплин «Основы бережливого производства», «Интеллектуальные системы эксплуатации и технического сервиса локомотивов», «Инновационные технологии и менеджмент ремонта локомотивного парка».

ВЫСТУПИЛА: Представитель обучающихся: член АК, студент гр. Л-22-2 Ташенова Д.К., которая отметила особую актуальность введения предлагаемых дисциплин «Цифровой инженерный менеджмент», «Информационно-документационное обеспечение соответствия и жизненного цикла вагонов/локомотивов».

ВЫСТУПИЛА: Представитель обучающихся: член АК, студент гр. В-22-1 Маханбетова Г.Е., которая отметила особую актуальность введения предлагаемых дисциплин с уклоном на развитие современных IT компетенций «Цифровые технологии и автоматизация в ремонте вагонов» и др..

ПОСТАНОВИЛИ:

1) Одобрить подготовленные для новой ОП «6В07187-Инженерный менеджмент вагонного комплекса» для внесения в реестр:

- разработанные структурные элементы (Паспорт, РО), компетентностную модель выпускника;
- учебный план на полный срок обучения (проект):
- описание дисциплин, прокет КЭД и КВК.

2) Одобрить подготовленные для новой ОП и «6В07191-Инженерный менеджмент локомотивного комплекса» для внесения в реестр:

- разработанные структурные элементы (Паспорт, РО), компетентностную модель выпускника;
- учебный план на полный срок обучения (проект):
- описание дисциплин, прокет КЭД и КВК.

3) Одобрить подготовленные для новой ОП и «6В07192-Подвижной состав железных дорог» для внесения в реестр:

- разработанные структурные элементы (Паспорт, РО), компетентностную модель выпускника;
- учебный план на полный срок обучения (проект):
- описание дисциплин, прокет КЭД и КВК.

4) Представить данные материалы для дальнейшего рассмотрения на КОК УМБ института «Транспорт и строительство».

Председатель: **Чигамбаев Т.О.**

Секретарь: **Ивановцева Н.В.**

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
АО «ALT 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.. В связи с открытием новой группы образовательных программ: В265 – «Железнодороржный транспорт и технологии» были разработаны и представленные на рассмотрение ОП. Предложил рассмотреть составляющие разделы новых образовательных программ для приёма 2025 года: Компетентностную модель выпускника и паспорта образовательных программ, а так же рабочие учебные планы, каталоги вузовского компонента (КВК), каталоги элективных дисциплин (КЭД).

ВЫСТУПИЛ:

1) И.о. заведующего кафедрой «Подвижной состав» Чигамбаева Т.О., который представил на рассмотрение составляющие разделы новых образовательных программ «6В07187 - Инженерный менеджмент вагонного комплекса», «6В07191 - Инженерный менеджмент локомотивного комплекса» и «6В07192 – Подвижной состав железных дорог» для приёма 2025 года: Компетентностную модель выпускника и паспорт образовательной программы, а так же рабочий учебный план, каталог вузовского компонента (КВК), каталог элективных дисциплин (КЭД).

На кафедре «Подвижной состав» было проведено заседание Академического комитета по образовательным программам и ведущих преподавателей кафедры с привлечением представителей работодателей и обучающихся по обсуждению структуры и содержания новых образовательных программ «6В07187 - Инженерный менеджмент вагонного комплекса», «6В07191 - Инженерный менеджмент локомотивного комплекса» и «6В07192 – Подвижной состав железных дорог», и было вынесно положительное решение по их одобрению.

Представленные материалы разработаны при участии работодателей, обучающихся и выпускников, с учётом требований НПА.

Согласовано с работодателями составлены РУП и КЭД для приёма 2025 года.

ПОСТАНОВИЛИ:

1. Утвердить представленную новую образовательную программу «6В07187 - Инженерный менеджмент вагонного комплекса» для 2025 года поступления: Компетентностную модель выпускника, КЭД, КВК, Рабочий учебный план, паспорт образовательной программы.
2. Утвердить представленную новую образовательную программу «6В07191 - Инженерный менеджмент локомотивного комплекса» для 2025 года поступления: Компетентностную модель выпускника, КЭД, КВК, Рабочий учебный план, паспорт образовательной программы.
3. Утвердить представленную новую образовательную программу «6В07192 – Подвижной состав железных дорог» для 2025 года поступления: Компетентностную модель выпускника, КЭД, КВК, Рабочий учебный план, паспорт образовательной программы.
4. Представить указанные документы для рассмотрения и утверждения на УС Академии.

Председатель УМБ ИТиС **Абдрешов Ш.А.**

Секретарь УМБ ИТиС **Мурзалина Г.Б.**

14. APPROVAL SHEET

№	Ф.И.О.	Место работы/ учебы	Должность	Дата согласования	Подпись
1	Егускова А.Т.	каф. Э	зав. каф	18.03.2025	[signature]
2	Голлобаев А.С.	каф. АКиБЖ	зав. каф	18.03.2025	[signature]
3	Мурамова Р.Д.	каф. ТУиБ	зав. каф	18.03.2025	[signature]
4	Абдрасилова	каф. СПОиФВ	зав. каф	18.03.2025	[signature]
5	Калмабаева Г.У.	каф. LE	зав. каф	18.03.2025	[signature]
6.	Ахметова Н.И.	каф. ОХ	зав. каф	18.03.2025	[signature]

15. CHANGES REGISTRATION SHEET

Publication number	Date of introduction	Changes	Signature
1	2	3	4