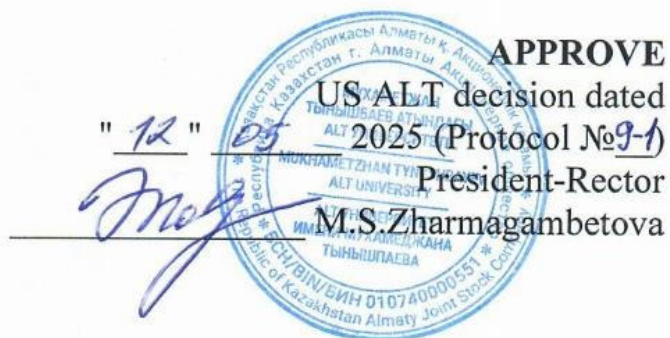


Joint stock company "Mukhametzhan Tynyshbayev ALT University"



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

A blue circular official stamp of the Joint Stock Company "Mukhametzhan Tynyshbayev ALT University" is placed over the signature. The stamp contains the university's name in Russian and Kazakh, its legal status as a JSC, and its identification number: ECU/BIN/ЕИН 010740000551. A handwritten signature in blue ink is written across the stamp.

EDUCATIONAL PROGRAM

**Name: «6B07191 - ENGINEERING MANAGEMENT OF THE
LOCOMOTIVE COMPLEX »**

Level of training: Bachelor's degree

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

Group of educational programs: B 265 Rail transport and technology

**Date of registration in the Registry: 11.07.2025
Registration number: 6B07100161**

Almaty, 2025

CONTENT

1. Information about the review, approval and approval of the program, developers, experts and reviewers	3
2. Regulatory references	5
3. Passport of the educational program	6
4. The graduate's competence model	7
5. Matrix of correlation of learning outcomes according to the educational program with academic disciplines/modules	11
6. Structure of the Bachelor's degree program	14
7. Working curriculum for the entire duration of training	15
8. Catalog of disciplines of the university component	17
9. Catalog of disciplines of the component by choice	27
10. Expert opinions	38
11. Reviewer's conclusion	44
12. Recommendation letters	45
13. Protocols of review and approval	42
14. Approval sheet	46
15. Change Registration Sheet	47

1. INFORMATION ABOUT CONSIDERATION, APPROVAL AND APPROVAL OF THE PROGRAM, DEVELOPERS, EXPERTS AND REVIEWERS (6B07191-EMLC, 2025)

1 DEVELOPED:

Associate Professor, PhD.

Acting Head of the Department of "RS", c.t.s.

Professor, d.t.s.

Associate Professor, d.t.s.

Associate Professor, c.t.s.

Associate Professor, c.t.s.

Assistant Professor, c.t.s.

Assistant Professor, c.t.s.

Deputy Head of production of the Almaty operational locomotive depot of the branch of LLP "KTZ-Freight transportation" - "Almaty branch of FT"

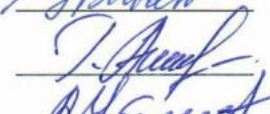
Student, gr. L-22-2



Bakyt G.B.



Chigambaev T.O.



Solonenko V.G.



Musaev J.S.



Ivanovtseva N.V.



Ashirbayev G.K.



Utepova A.U.



Dzhakupov N.R.



Iskakov M.S.

Tashenova D.K.

2 EXPERTS:

President of JSC "Locomotive kurastyru зауыты",
*Master of Technical Sciences in the Educational
program "Transport, transport equipment and
Technologies"*



Kamilov A.T.

General manager
«Alga A LRP» LLP



Uskenbaev S.A.

3 REVIEWERS:

Chief Engineer
of the Locomotive Operation Department
KTZ – Freight Transportation LLP



Sadykov A.A.

4 REVIEWED AND RECOMMENDED:

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

 Chigambaev T.O.

Meeting of the Institute's EMB
transport and construction
Protocol № 92 om « 6 » 05 2025 y.

 Abdreshov S.A.

EMC meeting ALT of the University named
after M.Tynyshpaevag
Protocol № 5 om « 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 11.07.2025.

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

11. Professional standard "Operation of locomotives and motor-car rolling stock", approved No. 256 dated 20.12.2019.

12. Professional standard "Quality control of locomotives after repair", approved 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	6B07100060
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	B 265 Rail transport and technology
5	Name of the educational program /	6B07191-Engineering management of the locomotive complex
6	EP type	New EP
7	EP purpose	Training of engineering and management personnel for the locomotive complex capable of designing, organizing and improving the processes of operation, maintenance and repair of locomotives, ensuring their 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 (SYP)	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 "6B07191-Engineering management of the locomotive 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

Educational program: 6B07191 - Engineering management of the locomotive complex.

EP purpose: Training of engineering and management personnel for the locomotive complex capable of designing, organizing and improving the processes of operation, maintenance and repair of locomotives, ensuring their 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. Formulate and comprehensively substantiate personal, civic and professional positions, demonstrating inclusivity, using knowledge in the field of social and humanitarian, legal disciplines and moral values, as well as effectively present them in the state, Russian and foreign languages.

LR2. To design innovative approaches and algorithms for solving practical problems in professional activity, integrating deep knowledge of natural science, physical and mathematical principles.

LR3. Optimize processes and systems in transportation engineering through the introduction of modern IT technologies, information and communication solutions and artificial intelligence systems.

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

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

LR6. To develop optimal solutions to applied problems related to reliability parameters and strength characteristics of components and parts of wagons, applying fundamental laws of mechanics, advanced engineering methods and elements of scientific research.

LR7. Design electrical and electronic systems for locomotives, focusing on innovative, energy-saving and renewable technologies, with justification for their application.

LR8. Develop diagnostic and forecasting systems for the technical condition of locomotive components, integrating digital platforms, advanced data analysis methods and scientifically based approaches.

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

LR10. To formulate innovative approaches to locomotive operation management, contributing to the identification of efficiency reserves, compliance with regulatory requirements, sustainable development, ensuring 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 diesel locomotives, electric locomotives and electric trains 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: a master of a section (workshop) of a locomotive depot; an engineer, a repair engineer; a specialist in operational management of a column of locomotive crews of traction rolling stock, crews of special railway rolling stock; a specialist in non-destructive testing, a specialist in operational management of a repair and maintenance team traction rolling stock.

And also according to the approved Professional Standards:

- Head of the locomotive depot;
- Engineer (for decoding speed-measuring tapes);
- Senior duty officer of the locomotive depot;
- Senior train driver-instructor of locomotive crews;
- Head of Locomotive Repair Control;
- Head of the locomotive depot stock base;
- Leading engineer of locomotive repair control;
- Heat engineer of locomotive crews;
- 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: Locksmith for locomotive repair, assistant locomotive driver.

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							

№	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
26	Python programming basics	3			LR3							
27	Professionally oriented foreign language	3	LR1									
28	Educational Practice	2			LR3		LR5		LR7	LR8		
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		
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 locomotive complex	4			LR3					LR8		LR10
44	Automation of technological processes				LR3						LR9	
45	Dynamics of locomotives	4			LR3			LR6				
46	IT technologies in transport				LR3							LR10
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	Locomotive Theory and Design	7						LR6				
52	Energy installations of transport equipment	5		LR2								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
53	Energy efficiency of locomotive traction and traction control	5						LR6				LR10
54	Locomotive Electrical Transmissions	4							LR7			
55	Bases of reliability of the rolling stock	5						LR6				
56	Organization of traffic safety and automatic brakes of locomotives	5						LR6				LR10
57	Intelligent locomotive operation and maintenance systems	6								LR8		
58	Management of Locomotive Complex Enterprises	4					LR5				LR9	LR10
59	Innovative technologies and management of locomotive fleet repairs	6			LR3		LR5				LR9	
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	Locomotive electrical equipment and control automation	5							LR7	LR8		LR10
63	Digital engineering management				LR3		LR5					
64	Locomotive Microprocessor Control Systems	4							LR7			LR10
65	Information and documentation support for the conformity and life cycle of locomotives									LR8	LR9	LR10
66	Design and calculation of components and parts of rolling stock	3			LR3			LR6	LR7			
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 "Mukhametzhany Tynyshbayev ALT University"

Educational Plan

Form of study: full-time

Field of study:
6B071 Engineering and Engineering trades

Group of educational programs:
B 065 Transport equipment and technologies

Name of the educational program:
6B07191 - Engineering management of the locomotive complex

Degree: Bachelor of Engineering and Technology

Admission: 2025 y.

APPROVED
By the decision of the Scientific
Council of ALT
from 12.04.2025, Protocol № 9-1

Chairman of the Academic Council
MUKHAMETZHAN TYNYSZHAYEV



№	Discipline code	Name of cycles and disciplines	Total labor intensity		Form of control, semester		The amount of study load, hours																Securing the chair	
			In academic hours	In academic hours	Exam	CP (CW)	Total hours	Contact information				RWS	1 course			2 course			3 course					
								lectures	practical	laboratory	INSGT		10 weeks	10 weeks	10 weeks	10 weeks	10 weeks	10 weeks	10 weeks	10 weeks				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
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-B-OK-1K	History of Kazakhstan	150	5	5		150	20	20		8	102					5					SHD&PE		
1.1.2.	23-B-OK-1I	Philosophy	150	5	7		150	20	20		8	102						5				SHD&PE		
1.1.3.	23-B-OK-1K	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-B-OK-1Ya	Foreign language	300	10	1,2,3,4,5		300		200		40	60	2	2	2	2	2					LE		
1.1.5.	23-B-OK-1(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-B-OK-Setz	Sociology	240	8	4,5,6,7		240	5	10		8	37					2					SHD&PE		
	23-B-OK-Kul	Culturology						5	10		8	37					2						SHD&PE	
	23-B-OK-Pol	Political science						5	10		8	37								2				SHD&PE
	23-B-OK-Psi	Psychology						5	10		8	37									2			
M4	Information technology and artificial intelligence module																							
1.1.7.	23-B-OK-1KT	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.	26-B-KV-EUT	Environmentally sustainable technologies	150	5	6		150	20	20	8	102											MVALS		
	25-B-KV-ZEUP	Green economy and sustainable entrepreneurship																				TLM		
	24-B-KV-0FG	Fundamentals of financial literacy																				TLM		
	25-B-KV-CI	Digital inclusion																				ICT		
	26-B-KV-ONH	Fundamentals of scientific research																				SHD&PE		
	23-B-KV-OPAK	Basics of law and anti-corruption culture																				SHD&PE		
TOTAL FOR THE CYCLE OF GED:			1680	56			1680	100	450	0	176	944	6	11	6	8	11	7	7	0	0			
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-B-KV-IM1	Engineering Mathematics 1	150	5	1		150	10	20		15	105	5									OE		
2.1.1.2	24-B-KV-IM2	Engineering Mathematics 2	150	5	2		150	10	20		15	105		5								OE		
2.1.1.3	25-B-KV-PF	Applied Physics	150	5	2		150	10	10	10	15	105		5								OE		
2.1.1.4	26-B-KV-KV-TMeh	Theoretical mechanics	120	4	2		120	10	20		15	75		4								SE		
M7	Professional module																							
2.1.1.5	25-B-KV-KMTM	Structural materials in transport engineering	120	4	1		120	20	10		15	75	4									MVALS		
2.1.1.6	25-B-KV-EOE	Electrical engineering and the basics of electronics	180	6	3		180	20	10	10	15	125			6							E		
2.1.1.7	26-B-KV-OTBzd	Occupational health and safety	150	5	8		150	10	20		15	105							5			MVALS		
2.1.1.8	25-B-KV-DMOK	Machine parts and design basics	150	5	4		150	20	10		15	105				5						MVALS		
M8	Information technology and artificial intelligence module																							
2.1.1.9	25-B-KV-AGKM	Engineering graphics and computer modeling	120	4	1		120	10	20		15	75	4									SE		
2.1.1.10	25-B-KV-GPP	Python programming basics	90	3	2		90		10		15	65		3								ICT		
M9	Practice-oriented module																							
2.1.1.11	25-B-KV-POIYa	Professionally oriented foreign language	90	3	6		90		40		15	35						3				LE		
2.1.1.12	25-B-KV-UP	Educational Practice	60	2	3		60								2							RS		
2.1.2	Component of choice:		1500	50	56	0	1500	140	170	30	165	995	4	0	15	6	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-APZhOB	Engineering profession in the railway industry of the future																						
2.1.2.2	25-B-KV-Tep	Heat engineering	120	4	3		120	10	10	10	15	75		4								RS		
	25-B-KV-MGGGP	Fluid and gas mechanics, hydroand pneumatic drive																						

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

8. CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAMS

6B07191 - Engineering management of the locomotive 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, Theory and design of locomotives, 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.
M7 - Professional module	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, Microprocessor control systems for locomotives, Organization of traffic safety and automatic brakes of locomotives, Electric machines and electric drive / Electromagnetic technical means, Energy efficiency of locomotive traction and traction control, Electrical equipment and automation of locomotive control

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	Innovative technologies and management of locomotive fleet repair Production (pre-graduate) practice 2, Final Certification
M7 - Professional module	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	Theory and design of locomotives, Organization of traffic safety and automatic brakes of locomotives, 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, The basics of artificial intelligence, IT technologies in transport Principles of computer-aided design of wagons, Technological design of locomotive infrastructure complex enterprises / Technological design of car infrastructure complex enterprises, Educational Practice
	BD	UC	Python programming 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 Principles of computer-aided design of wagons, Locomotive control systems , Electronic and microprocessor equipment

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
M7 - Professional module	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 the DB and PD cycles, Practical training 1,2
	PD	UC	Theory and design of locomotives	210	7	4	LR6	The principles of operation, structural elements and engineering and physical processes in locomotives are studied, taking into account modern digital solutions and sustainable development. Skills are being developed to assess reliability, maintainability and energy efficiency, analyze technical risks, and optimize design. Digital modeling, AI and scientific methods are used to substantiate innovative solutions in the design of locomotives.	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	Power plants of transport equipment, Electric transmission of locomotives, Fundamentals of reliability of rolling stock, Intelligent systems of operation and maintenance of locomotives, Innovative technologies and management of repair of locomotive fleet, Technical diagnostics of locomotives / Methods of non-destructive testing of rolling stock, Dynamics of locomotives, Electrical equipment and automation of locomotive control

1	2	3	4	5	6	7	8	9	10	11
M8 – Practice-oriented 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, Theory and design of locomotives	Fundamentals of rolling stock reliability, Electromagnetic technical means, Intelligent locomotive operation and maintenance systems, Innovative technologies and management of locomotive fleet repairs
M7 – Professional module	PD	UC	Energy efficiency of locomotive traction and traction control	150	5	7	LR7 LR10	The patterns and parameters of traction interaction between locomotives and trains, methods for calculating movement resistances and traction modes are considered. Competencies for analyzing energy efficiency and optimizing traction characteristics are being developed using digital models, AI, and scientific approaches. Special attention is paid to sustainable development, reduction of losses and improvement of operational efficiency of the locomotive complex.	Electrical engineering and the basics of electronics, Theoretical mechanics, Thermal engineering, Organization of traffic safety and automatic brakes of locomotives, Electric transmission of locomotives	Intelligent locomotive operation and maintenance systems, Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Electric transmission of locomotives	120	4	6	LR7	The principles of operation, types and modes of electric transmission of locomotives are studied, taking into account digitalization and sustainability. The skills of calculating, analyzing, and selecting energy-saving systems using AI and engineering modeling are being developed. The emphasis is on reliability, manageability, minimization of losses and risks, which is important for improving the efficiency and environmental safety of the locomotive complex.	Theory and design of locomotives, Power plants of transport equipment, Electric machines and electric drive/ Electromagnetic technical means,	Energy efficiency of locomotive traction and traction control, Intelligent locomotive operation and maintenance systems, Industrial (pre-graduate) practice 2, Final certification

1	2	3	4	5	6	7	8	9	10	11
M7 - Practice-oriented module	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, Theory and construction of locomotives, 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.	Organization of traffic safety and automatic brakes of locomotives, Intelligent systems of operation and maintenance of locomotives, Innovative technologies and management of locomotive fleet repair, Production practice 1, Industrial (pre-graduate) practice 2, Final certification
M8 - Practice-oriented module	PD	UC	Organization of traffic safety and automatic brakes of locomotives	150	5	6	LR6 LR10	Engineering principles, digital technologies and control systems are being studied to ensure traffic safety and the functioning of automatic brakes. The skills of risk analysis, fault diagnosis and optimization of braking processes using AI are being developed. Special attention is paid to sustainable development, digitalization, operational reliability and the introduction of modern solutions in the safety management of the locomotive complex.	The future of rail transport and its importance for sustainable development/Engineering profession in the railway industry of the future, 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 , Electrical equipment and automation of locomotive control, Intelligent systems for operation and maintenance of locomotives, Production practice 1, Industrial (pre-graduate) practice 2, Final certification

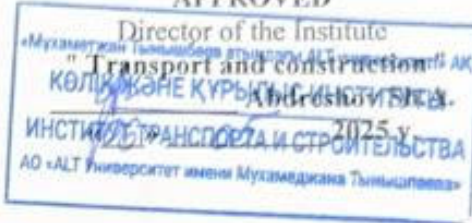
1	2	3	4	5	6	7	8	9	10	11
M8 - Practice-oriented module	PD	UC	Intelligent locomotive operation and maintenance systems	180	6	8	LR8	Competencies are being formed in the organization of the operational process and maintenance of locomotives, digital support and analysis of the processes of operation and maintenance of locomotives. Diagnostic methods, AI, elements of scientific analysis and risk management are used. Strategies for improving the reliability, sustainability and cost-effectiveness of the service are considered, taking into account the SDGs and the challenges of digital transformation of the railway industry. the complex.	The future of railway transport and its importance for sustainable development / Engineering profession in the railway industry of the future, Theory and design of locomotives, Power plants of transport equipment, Energy efficiency of locomotive traction and traction control, Electric transmission of locomotives, Fundamentals of reliability of rolling stock, Organization of traffic safety and automatic brakes of locomotives, Technical diagnostics of locomotives / Methods of non-destructive testing rolling stock	Innovative technologies and management of locomotive fleet repairs, Management of enterprises of the locomotive complex, Industrial (pre-graduate) practice 2, Final certification
	PD	UC	Management of the locomotive complex enterprise	120	4	9	LR5 LR9 LR10	Forms managerial and analytical competencies in the field of organization, planning and digitalization of the activities of enterprises of the locomotive complex. The methods of efficiency assessment, risk management, resources and quality based on digital platforms and AI are considered. Special attention is paid to sustainable development, safety, ecology and corporate responsibility in the context of the transformation of the transport industry.	Digitalization of management processes and technical support of the locomotive complex, Electrical equipment and automation of locomotive control, IT technologies in transport, Intelligent locomotive operation and maintenance systems, Fundamentals of technical operation of transport equipment	Industrial (pre-graduate) practice 2, Final certification

1	2	3	4	5	6	7	8	9	10	11
M8 - Practice-oriented module	PD	UC	Innovative technologies and management of locomotive fleet repairs	180	6	9	LR3 LR5 LR9	Modern locomotive repair technologies are being studied with an emphasis on digitalization, automation and forecasting of technical condition. Competencies in quality management, assessment of reliability and maintainability of nodes are being formed. The discipline covers a wide range of issues, including certain aspects of the development of 3D models of necessary spare parts and their production, as well as part replacement and maintenance strategies. Modern methods of improving the efficiency, sustainability and safety of repair processes, taking into account the SDGs, are considered.	Digitalization of management processes and technical support of the locomotive complex, Automation of technological processes, IT technologies in transport, Occupational safety and life safety, Theory and design of locomotives, Powerplants of transport equipment, Fundamentals of reliability of rolling stock, Intelligent locomotive operation and maintenance systems, Technical diagnostics of locomotives/ Methods of non-destructive testing of rolling stock	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			3240	108					

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"

2025 y.

CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAMS

6B07191- Engineering management of the locomotive 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				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 locomotives, Digitalization of management processes and technical support of the locomotive 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	Theory and design of locomotives, Fundamentals of rolling stock reliability, 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	Theory and design of locomotives, Fundamentals of rolling stock reliability, Educational practice	
	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, Energy efficiency of locomotive traction and traction control	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	

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, Theory and design of locomotives, Dynamics of locomotives, Fundamentals of rolling stock reliability, Organization of traffic safety and automatic brakes of locomotives, Fundamentals of technical operation of transport equipment, Transport safety and train traffic management systems	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, Theory and design of locomotives, Fundamentals of technical operation of transport equipment, Transport safety and train traffic control systems, Fundamentals of rolling stock reliability.	MV&LS

1	2	3	4	5	6	7	8	8	10	11	12
M7-Professional module	BD	EC	Technical diagnostics of locomotives	180	6	3	LR8	The discipline develops competencies in forecasting the technical condition of rolling stock using digital platforms, AI and scientific analysis. Students will learn how to evaluate the reliability of elements, taking into account maintainability and environmental damage. The course is aimed at improving maintenance, increasing efficiency and reducing losses, contributing to the sustainable development of the locomotive complex and minimizing emissions of harmful substances.	Applied Physics, Engineering Mathematics 1,2, Structural materials in transport engineering, Theory and design of locomotives	Innovative technologies and management of locomotive fleet repair, Intelligent locomotive operation and maintenance systems, Information and documentation support for the conformity and life cycle of locomotives, Production practice 1, Industrial practice 2, (pre-graduate) 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, Theory and design of locomotives	Innovative technologies and management of locomotive fleet repair, Intelligent locomotive operation and maintenance systems, Information and documentation support for the conformity and life cycle of locomotives, Production practice 1, Industrial practice 2, (pre-graduate) 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. Organization of traffic safety and automatic brakes of locomotives	Management of enterprises of the locomotive complex, 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. Organization of traffic safety and automatic brakes of locomotives	Management of enterprises of the locomotive complex, Production (pre-graduate) practice 2, Final certification	TLM

1	2	3	4	5	6	7	8	9	10	11	12
M4-Module of information technologies and artificial intelligence	BD	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, Electric transmission of locomotives, Electrical equipment and automation of locomotive control	RS
		EC2	Electromagnetic technical mediation elements 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, Electric transmission of locomotives, Electrical equipment and automation of locomotive control	RS
	BD	EC1	Digitalization of management processes and technical support of the locomotive complex	120	4	8	LR3 LR8 LR10	The discipline forms competencies in the application of digital technologies, software products and AI for monitoring, optimizing and visualizing the operational processes of rolling stock. Students will learn how to predict the technical condition of nodes, interpret operational data, and identify reserves for improving efficiency. The course focuses on management decisions aimed at reducing losses and rational use of resources, contributing to digital transformation and sustainable development of the industry.	Information and communication technologies, Fundamentals of scientific research, The basics of lean manufacturing, Production organization and enterprise management	Innovative technologies and management of locomotive fleet repairs, Management of the locomotive complex enterprise, 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, Electrical equipment and automation of locomotive control, Fundamentals of lean manufacturing, Production organization and enterprise management	Innovative technologies and management of locomotive fleet repairs, 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 locomotives	120	4	8	LR3 LR6	Dynamic processes in the locomotive-path system under various types of disturbances are studied. Competencies are being formed for calculating the dynamic characteristics of locomotives, criteria for safe movement, determining the optimal parameters of locomotive running gear, dynamic strength tests of locomotives using software tools (Mathcad, SolidWorks, Universal Mechanism), calculating applied problems of locomotive 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, Theory and design of locomotives, 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 enterprises of the locomotive complex, Innovative technologies and management of locomotive fleet repairs, 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	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	TLM

1	2	3	4	5	6	7	8	9	10	11	12
M4-Module of information technologies and artificial intelligence	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,	Innovative technologies and management of locomotive fleet repairs, Digitalization of management processes and maintenance of the locomotive 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	Innovative technologies and management of locomotive fleet repairs, Digitalization of management processes and maintenance of the locomotive complex, Automation of technological processes	RS
M4 - Module of information technologies and artificial intelligence	PD	EC1	Electrical equipment and automation of locomotive control	150	5	7	LR7 LR8 LR10	The principles of functioning and diagnostics of electric and electronic systems of locomotives, including automated controls and energy saving, are studied. Competencies are being developed in the application of AI, digital platforms and data analysis to improve reliability and environmental friendliness. The focus is on risk management, technological sustainability and innovation in the context of the digital transformation of the industry.	Theory and design of locomotives, Electrical engineering and fundamentals of electronics, Fundamentals of Python programming, Electric machines and electric drive, Electromagnetic technical means,	Automation of technological processes, Management of the locomotive complex enterprise	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, Theory and design of locomotives, Electrical engineering and fundamentals of electronics	Automation of technological processes, Management of the locomotive complex enterprise	RS

1	2	3	4	5	6	7	8	9	10	11	12
M4 - Module of information technologies and artificial intelligence	PD	EC1	Microprocessor-based locomotive control systems	120	4	7	LR7 LR10	The principles of building, functioning, and integrating microprocessor systems into locomotive control, including intelligent diagnostic modules, AI algorithms, and digital platforms, are being studied. Skills are being developed to analyze operational risks, assess the reliability and adaptation of systems to climatic and infrastructural conditions, taking into account sustainable development and the requirements of digital transformation.	Information and communication technologies, Electrical engineering and fundamentals of electronics, Technical diagnostics of locomotives, Basics of Python programming	Management of the locomotive complex enterprise, Innovative technologies and management of locomotive fleet repairs	RS
		EC2	Information and documentation support for the conformity and life cycle of locomotives				LR8 LR9 LR10	Study of the regulatory and technical framework and procedures for assessing the conformity of locomotives. 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 documentation management, compliance control, and information support for operation and repair are being mastered.	Information and communication technologies, Technical diagnostics of locomotives, Methods of non-destructive testing of rolling stock	Management of the locomotive complex enterprise, Innovative technologies and management of locomotive fleet repairs	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 LR7	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	2190	73						

10. EXPERT OPINIONS

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу (компетентностную модель выпускника, каталог
элективных дисциплин и учебный план) бакалавриата 6В07191 - Инженерный
менеджмент локомотивного комплекса группы образовательных программ:
В265 – Железнодорожный транспорт и технологии, по направлению подготовки:
6В071 - Инженерия и инженерное дело

Представленная на экспертизу разработанная в 2025 году новая Образовательная программа бакалавриата 6В07191 - Инженерный менеджмент локомотивного комплекса, для новой группы образовательных программ: В265 – Железнодорожный транспорт и технологии, рассматривалась в комплексе с компетентностной моделью выпускника, учебным планом и каталогом элективных дисциплин. Сокращение срока обучения до 3 лет и внедрение новых дисциплин является своевременным и стратегически важным решением. С точки зрения производства, такой шаг позволяет ускорить процесс подготовки молодых специалистов, что особенно актуально в условиях увеличения спроса на квалифицированные инженерные кадры в локомотивостроении и локомотивном хозяйстве.

Сокращение срока обучения стало возможным благодаря оптимизации учебного процесса и концентрации на ключевых компетенциях. Это не только сохраняет, но и усиливает качество подготовки, благодаря внедрению таких дисциплин, как «Цифровизация процессов управления и технического сопровождения локомотивного комплекса», «Интеллектуальные системы эксплуатации и технического сервиса локомотивов», «Инновационные технологии и менеджмент ремонта локомотивного парка», «Микропроцессорные системы управления локомотивами» и др.. Данные дисциплины были разработаны с учётом современных вызовов и технологий, применяемых в производстве и эксплуатации локомотивов. Они позволяют выпускникам быстро адаптироваться к реальным условиям производства, владеть навыками работы с современными цифровыми системами и диагностическим оборудованием. Таким образом, обновление программы и сокращение срока обучения ориентировано на формирование высококвалифицированных специалистов, готовых к работе в условиях цифровой трансформации и автоматизации производства.

Образовательная программа составлена на основе действующих НПА, НРК, ОРК при участии заинтересованных лиц. Содержание учебных дисциплин и результаты обучения ОП сформированы в соответствии с уровнем подготовки бакалавров, что прослеживается при проектировании содержания учебных дисциплин. Изучение дисциплин образовательной программы будет способствовать развитию профессиональных и исследовательских навыков будущих специалистов; поможет развить способность взвешенно и критически оценивать современные технические и научные достижения; поможет ориентироваться в выборе наиболее эффективных методов организации производства, а так же основных тенденций и изменений в железнодорожной отрасли.

Рассмотренная Образовательная программа 6В07191 - Инженерный менеджмент локомотивного комплекса составлена в соответствии с требованиями действующих профессиональных стандартов. Следует отметить, что в программе заложена специфика железнодорожной направленности ВУЗа, многолетний опыт прикладных научных исследований, кадровый потенциал и материальная база ВУЗа позволят качественно реализовать подготовку кадров по данной образовательной программе.

Исходя из вышеизложенного, рекомендую для использования в учебном процессе Образовательную программу бакалавриата 6В07191 – «Инженерный менеджмент локомотивного комплекса» для подготовки кадров по направлению 6В071 - Инженерия и инженерное дело.

Президент АО «Локомотив құрастыру зауыты»,
м.т.п. по ОП «ТТТТ»

05.02.2025.



Камилов А.Т.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ
на образовательную программу
«6B07191 - Инженерный менеджмент локомотивного комплекса», 3 года
по направлению подготовки: 6M071 - Инженерия и инженерное дело

Новая образовательная программа бакалавриата «6B07191 - Инженерный менеджмент локомотивного комплекса» и её ключевые элементы — компетентностная модель выпускника, каталоги дисциплин вузовского компонента и компонента по выбору, а также рабочий учебный план — представляют собой актуальный и современный комплекс. Содержание программы учитывает современные тенденции развития железнодорожной отрасли, включая цифровизацию и внедрение инновационных технологий, и соответствует стратегическим направлениям развития АО «НК «Қазақстан темір жолы» в части модернизации и инфраструктурного роста железнодорожного транспорта.

Учебный план с оптимизированной структурой и сокращённым сроком обучения до трёх лет способствует более оперативному выходу выпускников на рынок труда и их быстрой адаптации к профессиональным требованиям.

Выпускники программы формируют широкий спектр компетенций, необходимых для работы в локомотивном хозяйстве. Они будут подготовлены к решению задач по управлению предприятиями локомотивного комплекса, вопросам эксплуатации, технического обслуживания, диагностике и ремонту локомотивов, а также управлению рисками и совершенствованию производственных процессов.

Особое значение имеет включение в учебный план дисциплин, отражающих современные запросы отрасли: «Управление предприятиями локомотивного комплекса», «Основы бережливого производства», «Инновационные технологии и менеджмент ремонта локомотивного парка», «Интеллектуальные системы эксплуатации и технического сервиса локомотивов» и других. Эти дисциплины формируют у обучающихся компетенции, соответствующие будущим профессиональным вызовам.

Программа «6B07191 - Инженерный менеджмент локомотивного комплекса» разработана в соответствии с действующими нормативно-правовыми актами в области высшего образования и профессиональными стандартами эксплуатации и ремонта железнодорожного подвижного состава, а также управления и обеспечения безопасности движения на железнодорожном транспорте Республики Казахстан. К разработке программы были привлечены представители профессорско-преподавательского состава и студенты АО «АЛТ Университет им. Мухамеджана Тынышбаева», а также представители работодателей, что обеспечивает её соответствие реальным потребностям рынка труда.

Заключение: Образовательная программа «6B07191 - Инженерный менеджмент локомотивного комплекса» полностью отвечает требованиям ГОСО, отражает актуальные запросы рынка труда и профессиональные стандарты. Программа может быть рекомендована к внедрению в учебный процесс для подготовки специалистов по направлению 6M071 - Инженерия и инженерное дело.

Эксперт

Генеральный директор
ТОО «ЛРЗ Алга А»

13.02.2025г.



Ускенбаев С.А.

11. REVIEWER'S CONCLUSION

РЕЦЕНЗИЯ

на образовательную программу 6B07191 - Инженерный менеджмент локомотивного комплекса по направлению подготовки 6B071 - Инженерия и инженерное дело
Группа образовательных программ: B265 – Железнодорожный транспорт и технологии

Образовательная программа бакалавриата 6B07191–«Инженерный менеджмент локомотивного комплекса» разработана в 2025 году на базе актуальных результатов обучения (РО) с уклоном на управленческие компетенции и добавлением актуальных дисциплин. Срок обучения составляет три года. Сокращение срока обучения стало возможным благодаря оптимизации учебного процесса, концентрации на ключевых профессиональных компетенциях, повышению интенсивности изучения дисциплин и внедрению практико-ориентированного подхода. Этот шаг обеспечивает сохранение качества подготовки выпускников, соответствие современным требованиям рынка труда и ускорение выхода специалистов на профессиональную деятельность.

ОП имеет следующую структуру: Компетентностная модель выпускника, Матрица соотнесения результатов обучения по образовательной программе с учебными дисциплинами/модулями, Учебный план на весь срок обучения, Каталог дисциплин вузовского компонента, Каталог дисциплин компонента по выбору.

Рассмотрев содержательную часть образовательной программы бакалавриата 6B07191 – «Инженерный менеджмент локомотивного комплекса», необходимо отметить следующее:

- разработка ОП, учебных материалов и программ выполняется с учетом актуальных НПА и последних технологических изменений в отрасли;

- результаты обучения акцентированы на интерпретацию процессов и моделей объектов транспортной техники, основанных на общекультурных, профессиональных и управленческих компетенциях, а также на формирование аргументов и решение проблем, связанных с эксплуатацией, диагностикой и ремонтом локомотивного парка;

- содержание каталога элективных дисциплин и вузовского компонента отражает преемственность и последовательность изучения дисциплин, включены необходимые для освоения теоретических и практических навыков дисциплины, обеспечивающие подготовку специалистов на основе передовых технологий проектирования, производства, эксплуатации, технического обслуживания и ремонта вагонов и локомотивов;

- актуальность и важность освоения дисциплин: «Управление предприятиями локомотивного комплекса», «Микропроцессорные системы управления локомотивами», «Электрическое оборудование и автоматизация управления локомотивами», «Информационно-документационное обеспечение соответствия и жизненного цикла локомотивов»;

- ОП предусматривает профессионально-практическую подготовку в виде практики, содержание которой направлено на формирование практических навыков у обучающихся;

- для разработки ОП привлекались опытный профессорско-преподавательский состав, ведущие представители работодателей и обучающиеся, что учитывало их требования при формировании дисциплин профессионального цикла.

В целом, рецензируемая образовательная программа 6B07191–«Инженерный менеджмент локомотивного комплекса» соответствует основным требованиям ГОСО, национальной и отраслевой рамке квалификаций, профессиональным стандартам и способствует формированию общекультурных и профессиональных компетенций в области подготовки 6B071 - Инженерия и инженерное дело.

Рекомендуем образовательную программу 6B07191–«Инженерный менеджмент локомотивного комплекса», для реализации в учебном процессе АО «АЛТ Университет им. Мухамеджана Тынышпаева», при подготовке специалистов железнодорожного направления связанных с конструированием, эксплуатацией, техническим и сервисным обслуживанием, ремонтом локомотивов.

Главный инженер департамента
эксплуатации локомотивов
ТОО «КТЖ – Грузовые перевозки»



Садықов А.А.
20.02.2025.

12. LETTERS OF RECOMMENDATION



+7 727 299 6800 / 299 6700 / 299 6705 факс / info@olzha.com

WWW.OLZHA.COM

Заведующему кафедрой «Подвижной состав»
АО «АЛТ университет им. М.Тынышпаева»
Аширбаеву Г.К.

РЕКОМЕНДАТЕЛЬНОЕ ПИСЬМО

Уважаемый Галымжан Кожыхатович!

По Вашей просьбе Управление по ремонту тягово-подвижного состава АО «ОЛЖА» рассмотрело содержание образовательной программы «6В07191 – Инженерный менеджмент локомотивного комплекса».

Считаем, что программа отвечает современным требованиям отрасли, сочетает инженерную и управленческую подготовку, формирует у студентов практические навыки проектирования, организации и совершенствования процессов эксплуатации и ремонта локомотивов.

Отмечаем важность того, что в программе нашли отражение современные тенденции развития транспорта – внедрение цифровых технологий, использование инструментов искусственного интеллекта, автоматизации и систем анализа данных. Эти направления являются определяющими для повышения эффективности и безопасности локомотивного комплекса, а также для подготовки специалистов нового поколения, способных управлять сложными техническими и организационными процессами.

Рекомендуем включить в учебный план такие дисциплины, как «Инновационные технологии и менеджмент ремонта локомотивного парка» и «Цифровой инженерный менеджмент».

В целом программа обеспечивает подготовку специалистов, обладающих инженерными и управленческими компетенциями, готовых к работе как на производственных участках, так и на руководящих должностях в локомотивном комплексе.

АО «ОЛЖА» готово к дальнейшему сотрудничеству в рамках реализации образовательной программы «6В07191 – Инженерный менеджмент локомотивного комплекса», с целью подготовки высококвалифицированных инженерных кадров для железнодорожного транспорта.

Главный специалист Управления по ремонту
тягово-подвижного состава АО «ОЛЖА»



Туруспаев С.У.



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 Г.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» - Исаков 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 материалы 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» - Исаков 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 представленных материалов и своевременность введения

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 «КТЖ-Грузовые перевозки» - «Алматинское отделение ГП» Исаков 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, проект 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, проект 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;

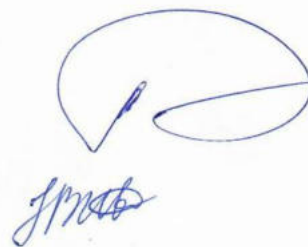
- учебный план на полный срок обучения (проект):

- описание дисциплин, проект КЭД и КВК.

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

Председатель:

Секретарь:



Чигамбаев Т.О.

Ивановцева Н.В.

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

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

г. Алматы

6 мая 2025г.

Председатель: Абдрешов Ш.А.

Секретарь: Мурзалина Г.Б.

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

ПОВЕСТКА ДНЯ:

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

По вопросу

СЛУШАЛИ: директора ИТиС Абдрешова Ш.А.. В связи с открытием новой группы образовательных программ: В265 – «Железнодорожный транспорт и технологии» были разработаны и представлены 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» Чигабаева 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 вынесено 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

[illegible]

15. CHANGES REGISTRATION SHEET

[illegible]