

JSC «Mukhametzhah Tynyshbayev ALT University»



APPROVE

Decision AC «Mukhametzhah Tynyshbayev ALT University» dated
" ___ " 20__ y. (Protocol No. __)



President-Rector
M. Zharnagambetova



EDUCATIONAL PROGRAM

Name: «7M07166 – Energy systems and energy management»

Level of training: specialized master's degree

Code and classification of areas of study:
7M071 - Engineering and engineering trades

Code and group educational programs:
M099 – electrical engineering and power engineering

Date of registration in the Registry: « ___ » _____ 202__ y.

Date of update in the Registry: « ___ » _____ 202__ y.

Registration number: _____

Almaty, 2025y.

CONTENT

1. Information about the review, approval and approval of the program, developers, experts and reviewers	3
2. Normative references	5
3. Passport of the educational program	6
4. Competence model of a graduate	7
5. Matrix for correlating learning outcomes in an educational program with academic disciplines/modules	11
6. The structure of the master's degree program in the profile direction (1.5 years)	12
7. Working curriculum for the entire period of study	13
8. Catalog of disciplines of the university component	14
9. Catalog of elective component disciplines	17
10. Expert opinions	20
11. Reviewer's Conclusion	22
12. Letters of recommendation	24
13. Review and approval protocols	25
14. Approval sheet	30
15. Change registration sheet	31

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

DEVELOPED BY:

Head of the Department Ass.
Professora



(signature)

Yegzekova A.
(Full name)

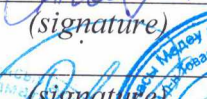
Assistant Professor



(signature)

Kaliev Zh.
(Full name)


Senior Lecturer



(signature)

Kalimbetov G.
(Full name)

General Director of KITR LLP"



(signature)

Dautov S.
(Full name)

Head of the branch of JSC NC "



(signature)

Mamyrbekov N.
(Full Name)

KTZ " Almaty Electric Power

Supply Distance-19

Master 's degreein MP-EE-25



(signature)

Oksikbaev N.
(Full name)

EXPERTS:

Deputy Head of thea branch of
JSC NC " KTZ " Almaty Electric
Power Supply Distance-19



(signature)

Orymbaev B.
(Full name)

Associate Professor of the
Department of" Energy "
Sathbayev University



(signature)

Zhumatova A.
(Full name)

REVIEWER:

Head of the Department
"Automation and Electric Power
Engineering in Transport"
Associate Professor of the
Department of" Energy "
Sathbayev University



(signature)

Oralbekova A.
(Full name)



(signature)

Hidolda E.
(Full name)


REVIEWED AND RECOMMENDED:

Meeting of the AC of the
Department"Energy"
Protocol №, " " 2025g
Meeting AtMB "EiCT"
Protocol №, " " 2025g
UMS meeting
Minutes №, " " 2025g



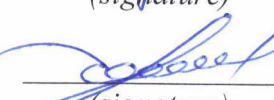
(signature)

A. Yegzekova
(Full name)



(signature)

A. Toygozhinova
(Full name)



(signature)

A. Kocabergenova
(Full name)

APPROVED by the decision of the Academic Council of « » 2025y. №

UPDATED « » 202 y.

4 REVIEWED AND RECOMMENDED:

Meeting of the AK (Department)
"Power Engineering"
Protocol №, " __ " __ 2025



(signature)

A. Yegzekova

UMBI meeting "Energy and Digital
Technologies"
Protocol №, " __ " __ 2025



(signature)

A. Toygozhinova

Meeting of the UMS "ALT University
named after M. Tynyshpaeva"
Protocol №, " __ " __ 2025



(signature)

A. Kodzhabergenova

5 APPROVED by the decision of the Academic Council of ALT University named after M. Tynyshpaeva" from " __ " __ 2025 No. __

6 UPDATED « __ » __ 202__y.

2. NORMATIVE REFERENCES

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

1. Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 No. 319-III (with amendments and additions as of January 08, 2021).
2. National Qualifications Framework approved by the protocol of March 16, 2016 of the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
3. Industry framework of qualifications in the field of "Education", approved by the Minutes of the Meeting of the Industry 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 No. 3 dated November 27, 2019.
4. State mandatory standard of postgraduate education (Appendix 8 to the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 604 with amendments and additions as of May 05, 2020).
5. Qualification directory of positions of managers, specialists and other employees, approved by Order No. 553 of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020.
6. Professional standard "Teacher", approved by the Order of the Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" No. 133 dated June 8, 2017.
7. Professional standard "Science", project of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken".
8. Rules of organization of the educational process on credit technology of training, approved by the Order of the Minister of the Ministry of Education and Science of the Republic of Kazakhstan No. 152 dated 20.04.2011. (with additions and amendments No. 563 dated October 12, 2018).
9. Classifier of training areas for personnel with higher and postgraduate education, approved by Order No. 569 of the Minister of Education and Science of the Republic of Kazakhstan dated October 13, 2018 (with amendments and additions as of June 05, 2020).
10. Algorithm for inclusion and exclusion of educational programs in the Register of Educational programs of Higher and Postgraduate Education, approved by Order No. 665 of the Minister of Education and Science of the Republic of Kazakhstan dated December 4, 2018 (with additions and amendments as of December 22, 2020).
11. RI-ALT-33 "Regulations on the procedure for developing an educational program for higher and postgraduate education".

3. PASSPORT OF THE EDUCATIONAL PROGRAM

№	Field name	Note
1	Registration number	7M07100480
2	Code and classification of the field of education	7M07 Engineering, manufacturing and civil engineering
3	Code and classification of areas of study	7M071 Engineering and engineering trades
4	Code and group of educational programs	M099- Energy and electrical engineering
5	Name of the educational program	7M07166 Energy systems and energy management
6	EP type	Acting
7	EP purpose	Training of highly qualified specialists with in-depth knowledge and practical skills in the field of design, operation and optimization of energy systems, as well as effective energy management. The program is aimed at developing the competencies necessary to implement innovative technologies and strategies for sustainable energy consumption in industry, construction and other sectors of the economy, taking into account modern challenges to energy security and the environment.
8	ISCED level	7
9	Level on NQF	7
10	Level on SQF	7
11	EP distinctive features	No
	Partner Higher education institution (joint educational program)	-
	Partner higher education institution (two-degree educational program)	-
12	Form of training	Full-time
13	Language of education	Kazakh, Russian
14	Volume of the credits	60
15	Awarded Academic Degree	Master of Engineering and Technology in the educational program «7M07149 - Electrical power engineering »
16	Availability of an appendix to the license for the direction of training	№ KZ12LAA00025205 (004)
17	EP accreditation existence	Available
	Name of the accreditation body	ND «Independent Agency of Accreditation and Rating» (IAAR)
	Validity period of accreditation	5 years

4. COMPETENCE MODEL OF A GRADUATE

Purpose of the educational program: Training of qualified specialists for production and technological activities who have the skills to manage the parameters of the optimal mode of operation of equipment, quality control of the functioning of substations, electrical networks and power supply systems of enterprises of various industries.

Objectives of the educational program:

1. Formation of a personality capable of self-improvement and professional growth with versatile humanitarian and natural science knowledge and interests.
2. Formation of the ability to critically rethink the accumulated experience, change, if necessary, the profile of one's professional activity, awareness of the social significance of one's future profession, and having high motivation to perform professional activities.
3. Formation of special knowledge, abilities, skills and competencies in relation to the field of professional activity.
4. Formation of the ability to generalize, analyze, perceive information, set a goal and choose ways to achieve it.
5. Formation of readiness to implement energy and resource-saving technical policies in the design, installation and operation of electrical power and electrical technological equipment of industrial enterprises.
6. Formation of graduates' readiness for production and technological activities, in establishing the parameters of the optimal operating mode of equipment, monitoring the quality of operation, improving, modernizing and improving the technical and economic indicators of substations, electrical systems and networks, power supply of enterprises in various industries, through the study of elective disciplines.

Learning outcomes:

- LO 1 - To determine the parameters of the power system for solving technical problems of mode control using digital technology and software.
- LO 2 - To justify measures aimed at energy and resource conservation with the use of new energy-saving technologies.
- LO 3 - Analyze technical measures to solve problems of reliability of power supply systems and quality of electric energy, the main ways to improve the operational reliability of energy systems.
- LO 4 - To argue the choice of power system management based on the principles of lean production, minimizing all types of losses in the process of activity using SMART technologies.
- LO 5 - To form practical skills of work on experimental developments, object modeling, theoretical and experimental research, drawing up an application for an invention.
- LO 6 - Classify the operating parameters of the electrical complex and the influence of electromagnetic compatibility in the operation of electrical equipment.
- LO 7 - Develop regulatory and technical documentation based on innovative equipment and technology in the energy industry.
- LO 8 - Present research results in oral and written form, including in a foreign language.
- LO 9 - Demonstrate management solutions in business projects taking into account professional, interpersonal and intrapersonal problems by means of management psychology.

Area of professional activity: The sphere of professional activity, which includes the field of science and technology, which includes a set of technologies, means, methods and methods of human activity aimed at creating conditions for the production, transmission, distribution and consumption of electricity.

Objects of professional activity: The objects of professional activity of graduates are enterprises for the production, transmission, distribution and consumption of electricity: branches of NC KTZ JSC for power supply, KEGOC JSC, AZhK JSC, Almaty Metro Kurylys, and other energy enterprises. As well as research and development organizations.

Types of professional activities:

Types of professional activities include:

- design and engineering,
- production and technological,
- service and operational,
- organizational and managerial,
- installation and commissioning,
- calculation and design.

Functions of professional activity:

Master: carries out maintenance and control over the quality of operation, improvement, modernization and improvement of the technical and economic indicators of power plants and substations, electrical systems and networks, relay protection and automation of electrical power circuits, power supply to enterprises in various industries; carries out metrological verification and technical diagnostics of fixed assets of electrical stations and substations, electrical systems and networks, relay protection and automation of electrical power systems; carries out an analysis of the state and dynamics of quality indicators of objects of activity using modern methods and research tools; carries out the development of plans, programs and research methods; predicts the consequences of decisions made based on the research results; evaluates the technical and economic efficiency of decisions made.

List of specialist positions: Chief engineer, head of department, chief specialist, safety and labor protection engineer, power engineer, chief mechanic, leading engineer, senior foreman (production) section, head of traction substation, head of district (contact network, power supply), head (electrical) laboratory, head of the carriage (laboratory), chief energy dispatcher.

Professional certificates received upon completion of training: not provided.

Requirements for previous level of education: higher education (bachelor's degree).

Experimental research work of a master's student (ERWM)

Planning of ERWM in weeks is determined based on the standard work time of the master's student during the week. The number of credits allocated for the implementation of ERWM in a specific academic period is determined by the working curriculum of the professional educational program.

ERWM should:

- 1) correspond to the profile of the master's educational program in which the master's project is being carried out and defended;
- 2) be based on modern achievements of science, technology and production and contain specific practical recommendations, independent solutions to management problems;
- 3) be carried out using advanced information technologies;
- 4) contain experimental and research (methodological, practical) sections on the main protected provisions.

Within the framework of the ERWM, the individual work plan of a master's student for familiarization with innovative technologies and new types of production provides for mandatory scientific internship in scientific organizations and (or) organizations of relevant industries or fields of activity.

ERWM is planned in parallel with other types of educational work or in a separate period.

The results of the experimental research work at the end of each period of its completion are documented by the undergraduate in the form of a report.

The final result of ERWM is a master's project.

The goal of ERWM is to obtain new results that are important for theory and practice in a given subject area, as well as to master theoretical and experimental methods for studying objects (processes, effects, phenomena, structures, projects) in a given subject area.

The objectives of the ERWM are:

- organization of training for master's students in the theory and practice of conducting experimental research;

- development of creative thinking and independence in the master's student, deepening and consolidating the acquired theoretical and practical knowledge;

- identifying the most gifted and talented undergraduates, using their creative and intellectual potential to solve pressing problems in science and technology;

- developing a master's student's interest in scientific creativity, teaching them methods and ways to independently solve applied problems.

Scientific internship is carried out for the purpose of:

- fulfilling the objectives of the master's thesis;

- familiarization with innovative technologies and new types of production;

- familiarization with the latest theoretical, methodological and technological achievements of domestic and foreign science;

- familiarization with modern methods of scientific research, processing and interpretation of experimental data;

consolidation of theoretical knowledge acquired in the process of learning to acquire practical skills, competencies and professional experience in the specialty being trained, as well as mastering advanced foreign experience.

Requirements for ERWM:

- 1) corresponds to the profile of the master's educational program, according to which the master's project is being carried out and defended;

- 2) is based on modern achievements of science, technology and production and contains specific practical recommendations, independent solutions to management problems;

- 3) is carried out using advanced information technologies;

- 4) contains experimental and research (methodological, practical) sections on the main protected provisions.

The department in which the master's program is implemented determines special requirements for the preparation of master's students in the research part of the program.

Special requirements include:

- knowledge of modern issues of this branch of knowledge;

- the presence of specific specific knowledge on the scientific problem studied by the undergraduate;

- ability to practically carry out scientific research, experimental work in one or another scientific field related to the master's program (master's project);

- ability to work with specific software products and specific Internet resources.

Scientific supervisors are obliged to ensure high-quality organization of ERWM and its methodological formulation.

The main content of the ERWM is reflected in the individual work plan of the master's student.

Contents of EIRM

Experimental research work at the department can be carried out in the following forms:

- fulfillment of tasks of the scientific supervisor in accordance with the approved plan of experimental research work;
- participation in scientific and practical seminars, theoretical seminars (on the research topic), as well as in the scientific work of the department;
- speaking at conferences of young scientists;
- preparation and publication of abstracts of reports, scientific articles;
- preparation and defense of scientific reports on the areas of ongoing scientific research;
- participation in a real research project carried out at the department within the framework of budgetary and extra-budgetary research programs (or within the framework of a received grant), or in a partner organization for the implementation of master's training;
- preparation and defense of a master's project.

The list of forms of experimental research work at the department for master's students in specialized studies can be specified and supplemented, depending on the specifics of the master's program.

EIRM results

In addition to the above forms, the result of experimental research work is:

in the first semester:

- the topic of the project approved by the Academic Council of the Academy;
- developed and approved individual work plan for the master's student, indicating the main activities and deadlines for their implementation;
- determination of goals, objectives, scope, subject of research;

in the second semester:

- study and collection of practical material for the master's project, including the development of a methodology for data collection, methods for processing results, assessing their reliability;
- completion of at least 50% of the volume of theoretical and experimental work on the research topic;
- implementation of other activities provided for by the individual work plan of the master's student;

in the third semester:

- processing and analysis of factual material for the master's project, including assessment of its sufficiency to complete the project, development and construction of graphic images and other illustrations on the research topic;
- fulfillment of 100% of the theoretical and experimental work on the research topic;
- publication of at least 1 publication and/or 1 speech at a scientific and practical conference;
- implementation of other activities provided for by the individual work plan of the master's student;
- passing a semester certification based on the results of the EIRM;
- preparation of the final text of the master's project.

6. THE STRUCTURE OF THE MASTER'S DEGREE PROGRAM

№ п/п	Name of cycles of disciplines	General labor intensity	
		in academic hours	in academic hours
1.	Theoretical training	1920	64
1.1	Cycle of basic disciplines (BD)	450	15
1)	University Component (UC):	180	6
	Foreign language (professional)	60	2
	Management	60	2
	Management Psychology	60	2
2)	Component of choice (CC)	270	9
1.2	Cycle of profile disciplines (PD)	1470	49
1)	University component	450	15
2)	Component of choice	810	27
3)	Production practice	210	7
2.	Experimental research work of a master's student (ERWM)	540	18
1)	Experimental research work of a master's student, including internship and implementation of a master's project	540	18
3	Additional types of training (ATT)	-	-
4	Final certification (FC)	240	8
1)	Preparation and defense of a master's thesis (project) (PDMT (P))	240	8
	Total	1800	60

JSC "AUI University named after Mukhametzhan Tyshbayev"

Form of study: full-time

CURRICULUM

Direction of training:

5M071 - Engineering and engineering work

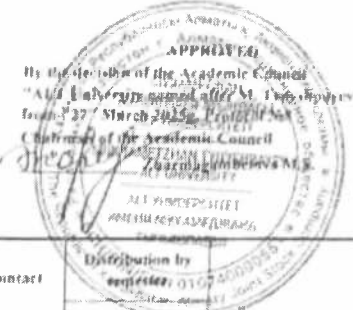
Duration of study: 4 years

Group of educational programs:

5M099 - Energy and electrical engineering

Name of the educational program:

5M07166 - Electric power industry



Admission: 2025

Degree: master of technical sciences

№	Discipline code	Name of cycles and disciplines	Total labor intensity		Form of control, semester		The amount of study load, contact hours							Distribution by semester		Securing the chair
			in academic hours	in academic credits	Exam	CP (CP)	Total hours	Classroom			IWS		1st course			
								lectures	practical	laboratory	IWS TT	IWS	1 sem.	2 sem.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	
THEORETICAL TRAINING																
1 CYCLE OF BASIC DISCIPLINES (DB):																
1.1. University component:			180	6			180	30	15	0	45	90	6	0		
1.1.1	23-0-M-VK-Meng	Management	60	2	1		60	15			15	30	2		TSaB	
1.1.2	23-0-M-VK-InvP	Foreign language (professional)	60	2	1		60		15		15	30	2		LE	
1.1.3	23-0-M-VK-PU	Managerial Psychology	60	2	1		60	15			15	30	2		SHDnPE	
1.2. Component of choice:			120	4	1	0	120	15	15	0	15	75	4	0		
1.2.1	23-0-M-3.V-IP	Learn manufacturing	120	4	1		120	15	15		15	75	4		RS	
1.2.1	23-0-M-KV-SMARTTT	SMART technologies in transport	120	4	1		120	15	15		15	75	4		RS	
TOTAL by DB cycle:			300	10			300	45	30	0	60	165	10	0		
2 CYCLE OF PROFILE DISCIPLINES (PD):																
2.1. Component of choice:			300	10			300	30	30	0	30	210	10	0		
2.1.1	25-M-VK-SEPTE	Modern energy audit and improvement of technological energy efficiency	150	5	1		150	15	15		15	105	5		E	
2.1.2	25-M-KV-ITVISE	Integration of traditional and renewable energy sources into electricity supply systems	150	5	1		150	15	15		15	105	5		E	
2.2. University component:			300	10	2	0	300	30	30	0	30	210	10	0		
2.2.1	25-M-KV-ORNE	Assessment of risks and reliability of energy supply	150	5	1		150	15	15		15	105	5		E	
2.2.1	25-M-KV-NRPSE	Reliability and risk based approach on power supply systems	150	5	1		150	15	15		15	105	5		E	
2.2.2	25-M-KV-EKETP	Electrical Complexes and Electric Drives of Technological Processes	150	5	1		150	15	15		15	105	5		E	
2.2.2	25-M-KV-EUTP	Electrical installations in technological processes	150	5	1		150	15	15		15	105	5		E	
3)	25-0-M-VK-PPr	Industrial practice	270	9	2		270						9		E	
TOTAL for the PD cycle:-			870	29			870	60	60	0	60	420	20	9		
2. Experimental research work of a Master's student (EIRM)			390	13			390							13		
1)	25-0-M-VK-EIRM	Experimental research work of a master's student, including internship and implementation of a master's project	390	13	2									13	3	
3. Additional types of education (ATE)																
Total theoretical training			1170	39			1170	105	90	0	120	585	30	9		
4 Final certification (FC)																
			240	8			240							8		
	23-0-M-VK-OZMP	Registration and protection of the master's project	240	8										8	3	
TOTAL FOR THE ENTIRE PERIOD OF STUDY			1800	60			1800	105	90	0	120	585	30	30		

AGREED:

Ad. Vice-Rector for AD Kozhuhetgenova A.K.

DEVELOPED BY:

Director of the Institute "EAD" Teigozhinova A.Zh.

Head of the Department of "E" Yegrekova A.Y.

8. CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAM

7M07166 Energy systems and energy management

Level of education: Master's degree

Duration of study: 1 years

Year of admission: 2025 year

Cycle	Component	Name of the discipline	Overall labor intensity		Semester	Learning outcome	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours	in academic loans					
1	2	3	4	5	6	7	8	9	10
BD	UC	Foreign language (professional)	60	2	1	LO 8	The discipline "Foreign Language (Professional)" is aimed at mastering the professional foreign language at an advanced level. Master's degree students learn the grammatical features of academic style, develop oral and written communication skills, and present research results through reports and publications using modern teaching methods.	Bachelor's majors	ERWM, Production practice
BD	UC	Managerial Psychology	60	2	2	LO 9	It is aimed at studying the theoretical and methodological foundations of management psychology, the main socio-psychological problems of management and ways to solve them, familiarization with the methods of studying important socio-psychological characteristics of the individual and the team, professional, interpersonal and intrapersonal problems by means of management psychology.	Bachelor's majors	Production practice
BD	UC	Management	60	2	1	LO 9	Forms knowledge about the organization as an object of management, considers situational and process approaches in management, engineering and reengineering of business processes, explores the theory and practice of management, explores the role functions of the manager and subordinates, studies ways of planning the strategy of management activities, stimulating performers to high-performance work, organizing	Bachelor's majors	Managerial Psychology

							effective control, etc., gives practical skills in developing style management and management decision-making tactics. Active teaching methods are used, such as role-playing games, etc.		
PD	UC	Modern energy audit and improvement of technological energy efficiency	150	5	2	LO 5	The discipline is aimed at developing students' theoretical knowledge and practical skills in the field of energy audit, analysis of energy consumption and development of measures to improve the energy efficiency of technological processes. The course examines modern methods and tools of energy survey, regulatory framework, principles of assessment and optimization of energy consumption in enterprises. Special attention is paid to the use of innovative technologies and digital solutions to improve energy efficiency in various industries.	Bachelor's majors	Final assessment
PD	UC	Experimental research work of a master's student, including internship and implementation of a master's project	390	15	1, 2, 3	LO 1-9	The form of conducting experimental research work of a graduate student can be specified and supplemented depending on the specifics of the master's program, the topic of the master's thesis. The experimental research work of a master's student includes: - experimental research work; - scientific publications (participation in scientific conferences and seminars); - writing a master's project	Bachelor's majors	Final assessment
PD	UC	Integration of traditional and renewable energy sources in the electricity supply system	150	5	1	LO 3, 7	The discipline studies the principles of joint operation of traditional and renewable energy sources in modern power supply systems. The technical, economic and managerial aspects of integration, issues of reliability, sustainability and quality of electricity, as well as the use of smart grids and energy storage systems are considered. Special attention is paid to the analysis of operating modes of energy systems with a high proportion of renewable energy sources and methods of their optimization.	Bachelor's majors	Operational development methodology

PD	UC	Production practice	270	9	3	LO 1-7	The practical training of a master's student is carried out in order to consolidate the theoretical knowledge gained in the course of training, acquire practical skills, competencies and professional experience in the specialty under study, as well as the development of best practices.	Bachelor's majors	Final assessment
TOTAL			1800	60					



AGREED

General Director of «KITD» JSC,
S. Dautov
2025y



APPROVED

Director of the «EDT» Institute

A. Togozhinaova
2025y
Институт энергетики и цифровых технологий
АО «АЛТ Университет имени Мухамеджана Тынышпаева»

CATALOG OF DISCIPLINES OF THE OPTIONAL COMPONENT

EDUCATIONAL PROGRAM

7M07166 Energy systems and energy management

Level of education: Master's degree

Duration of study: 1 years

Year of admission: 2025 year

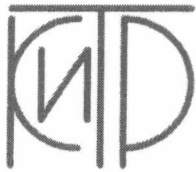
Cycle	Component	Name of the discipline	Overall labor intensity		Semester	Learning outcome	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours	in academic loans					
1	2	3	4	5	6	7	8	9	10
BD	EC	SMART technologies in transport	120	4	1	LO 1, 4	The study of intelligent systems for monitoring and managing operational processes. Development of skills in working with IoT, digital platforms and analytical systems. Formation of the ability to use SMART technologies to improve reliability, safety and operational efficiency..	Undergraduate disciplines	ERWM, Industrial practice
		Lean manufacturing				LO 4	Mastering methods of minimizing losses and increasing production efficiency. Development of skills in process analysis and implementation of lean approaches in the operation and repair of rolling stock. Formation of the ability to develop productivity improvement projects based on the rational use of resources.		
PD	EC	Assessment of risks and reliability of energy supply	150	5	1	LO 2	The discipline provides a deep understanding of methodologies and tools for risk assessment and reliability analysis in energy supply. Modern models of failure forecasting, quantitative methods of risk analysis, approaches to managing and reducing vulnerabilities of energy systems to ensure their stability and safety in conditions of complex	Bachelor's majors.	Final assessment

						operational and man-made factors are considered.		
		Reliability and risk-based approach in power supply systems				LO 7 When studying the discipline, questions are considered on the principles, methods and technical means of rational use of electricity and reducing energy losses in the power supply system of an industrial enterprise, providing consumers with electric energy with standardized quality, reliability and efficiency. Within the framework of the discipline, guest lectures are provided by top managers and specialists of scientific and design institutes. Teaching methods - case-study, group discussions.	Bachelor's majors.	Final assessment
PD	EC	Electrical Complexes and Electric Drives of Technological Processes	150	5	1	LO 3 The course focuses on studying the principles of operation, design, maintenance, and management of electrical complexes and electric drives used in technological processes across various industries. Modern technologies, methods of automation, energy efficiency, and issues related to the integration of equipment into production systems are explored. The discipline equips master's students with the knowledge and skills necessary for designing, operating, and modernizing electrical complexes and electric drives. It prepares students to address challenges in automation, improve the efficiency and reliability of technological processes, and utilize modern technologies and management methods.	Bachelor's majors	Mutual electromagnetic influence in electrical equipment
		Ways to improve reliability				LO 3 Studies the main methods of calculating the reliability of power supply systems, analyzing the reliability of individual power supply systems, the main ways to improve the operational reliability of energy systems, providing consumers with electric energy with standardized quality, reliability and efficiency. Active teaching methods: teamwork, discussions. Within the framework of the discipline, guest lectures are provided by top managers of JSC NC KTZ.	Bachelor's majors.	Mutual electromagnetic influence in the electric power industry
TOTAL			1800	60				

Head of the Department of "Energy"



Yegzekova A.T.



«КАЗАХСКИЙ ИНСТИТУТ ТЕХНИЧЕСКОГО РАЗВИТИЯ»

Товарищество с ограниченной ответственностью

050010, г. Алматы, улица Төле би,
дом 45/91, кв. 2
БИН 051 140 006 727

тел./факс 8 (727) 261-03-91,
e-mail: kitr_2006@list.ru
www.kitr.kz

050010, Алматы қ., Төле би көшесі,
45/91 үй, пәтер 2
БСН 051 140 006 727

№ 11-06/225

от «13» *сәуірта* 2025 г.

Заведующей кафедрой «Энергетика»
АО «АЛТ Университета имени
Мухамеджана Тынышпаева»
Егзековой А.Т.

Уважаемая, Анар Глюлесовна!

Руководство ТОО «Каззахский институт технического развития» в лице директора Даутова С.С. ознакомилось с содержанием образовательных программ «7M07149-Электроэнергетика», «7M07166-Энергетические системы и энергоменеджмент» и «8D07168-Электроэнергетика» и внесло следующие рекомендации:

- расширить объём дисциплин, связанных с прикладными исследованиями, цифровыми технологиями и интеллектуальными системами управления энергией;

- внедрить междисциплинарные курсы, объединяющие электроэнергетику, ИТ и энергоменеджмент;

- усилить исследовательскую и проектную составляющую, в том числе за счёт магистерских кейс-проектов и публикационной активности.

Предлагается включить в содержание образовательных программ следующие направления и дисциплины:

- Цифровая энергетика и управление энергосистемами;

- Энергоменеджмент и энергоаудит промышленных предприятий.

Реализация данных рекомендаций будет способствовать повышению практической направленности подготовки магистров и докторов PhD, ориентированных на современные требования энергетической отрасли.

Директор



Даутов С.С.



Система менеджмента качества сертифицирована СТ РК ИСО-9001-2016

АО «АЛТ Университет имени Мухамеджана Тынышпаева»

ПРОТОКОЛ № 8
заседания кафедры «Энергетика»

г. Алматы

13 февраля 2025г.

Председатель: Егзекова А.Т.

Секретарь: Уалиева Ж.Т.

Присутствовали: заведующий кафедрой Егзекова А.Т., доктор PhD, д.т.н., ассис. проф. Абдрахманов Е.А., доктор PhD, ассистент профессор Калиев Ж.Ж., ассис. проф Утепбергенова С.М., магистр, сениор-лектор Койшибаева К.Ж., магистр, магистр, магистр, сениор-лектор Калимбетов Г.П., магистр, ассистент-преподаватель Уалиева Ж.Т., магистр, ассистент-преподаватель Сейтбек Е.

Представители с производства: Алиев М.Ж. – главный менеджер функционального направления по производству и технологиям департамента электрификации и энергетика филиала АО «НК» «КТЖ» Дирекция «Магистральной сети», Мамырбеков Н.М. – начальник Алматинской дистанции электроснабжения «Алматинское отделение магистральной сети», Жансеитов Т.К. – главный инженер по технике безопасности Алматинской дистанции электроснабжения АО «НК» «КТЖ» «Алматинское отделение магистральной сети», Койшиев Т.К. – д.т.н., профессор кафедры «НТиКФ» КазНУ им.Аль-Фараби, Қали С.Б. – председатель правления «локальный профсоюз Серіктес».

Обучающиеся: студент группы МП-ЭЭ-25 Оксикбаев Н.С. ИТ-ЭЭ-22-6к Рахимов Ф.Р.

ПОВЕСТКА ДНЯ:

1. Обновление каталог элективных дисциплин и образовательных программ 6B07121 «Электроэнергетика».
2. Обновление каталог элективных дисциплин и образовательных программ 6B07188 «ИТ Энергетика»
3. Разное

По первому вопросу СЛУШАЛИ: Зав.кафедрой Егзекову А.Т., с предложением рассмотреть обновление по трем уровням образования: бакалавриат, магистратура и докторантура по действующим ОП кафедры «Энергетика».

Бакалавриат: ОП 6B07121 «Электроэнергетика», ОП 6B07188 ИТ Энергетика

Магистратура: ОП 7M07166-Энергетические системы и энергоменеджмент (профильная),

Докторантура: ОП 8D07160-Электроэнергетика.

ВЫСТУПИЛИ: Мамырбеков Н.М. начальник «Алматинской дистанции электроснабжения» с информацией, что образовательная программа охватывает все требования, предъявляемые представителями работодателей. С предложением оставить без изменений.

Калиев Ж.Ж. разработчик образовательных программ всех 3 уровней, в связи с актуализацией предлагает уменьшить количество дисциплин ОП, схожие дисциплины укрупнить, это поможет преподавателям сконцентрироваться на одной полной программе дисциплины. В ходе обсуждения среди профессорско-преподавательского состава (ППС), сотрудников и обучающихся. Учтены предложения работодателей и выпускников.

ПОСТАНОВИЛИ:

1. Информацию принять к сведению;
2. Актуализировать ОП Электроэнергетика и ОП ИТ Энергетика всех уровней.
3. Актуализированные и обновленные ОП загрузить в ЕСУВО.

Председатель
Секретарь



Егзекова А.Т.
Уалиева Ж.Т.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7М07166 – «Энергетические системы и энергоменеджмент»
по направлению подготовки 7М071 – «Инженерия и инженерное дело»

Образовательная программа 7М07166 – «Энергетические системы и энергоменеджмент» по направлению подготовки 7М071 – «Инженерия и инженерное дело» соответствует современным требованиям в области энергетики и инженерного дела. Программа разработана с учетом актуальных международных стандартов и ориентирована на подготовку высококвалифицированных специалистов, способных эффективно работать в сфере проектирования, эксплуатации и оптимизации энергетических систем. В структуре программы гармонично сочетаются теоретические знания и практические навыки, что обеспечивает комплексное освоение дисциплин, связанных с энергоменеджментом, энергетической безопасностью, возобновляемыми источниками энергии и инновационными технологиями в энергетике. Особое внимание уделено развитию компетенций по управлению энергоресурсами и снижению энергозатрат, что отвечает современным экономическим и экологическим вызовам.

Учебный план программы включает современные методы обучения, использование специализированного программного обеспечения и проведение исследовательской работы, что способствует формированию критического мышления и инновационного подхода у обучающихся. Подготовка кадров по данной программе позволит выпускникам успешно реализовывать проекты в области энергетики, способствовать развитию устойчивой энергетической инфраструктуры и внедрению энергоэффективных решений.

В целом, образовательная программа 7М07166 – «Энергетические системы и энергоменеджмент» является актуальной, сбалансированной и конкурентоспособной, отвечает требованиям рынка труда и способствует подготовке квалифицированных инженеров-энергетиков, готовых к профессиональной деятельности в условиях современного энергетического сектора.

Эксперт:

*Заместитель начальника филиала АО НК «КТЖ»
Алматинская дистанция электроснабжения ЭЧ-19*

Орымбаев Б.И.

«16»

2025 г.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7М07166 – «Энергетические системы и энергоменеджмент»
по направлению подготовки 7М071 – «Инженерия и инженерное дело»

Реализация образовательной программы 7М07166 – «Энергетические системы и энергоменеджмент» осуществляется посредством последовательности изучаемых дисциплин, с установлением конкретных задач и целевых индикаторов. Четко прослеживается междисциплинарное взаимодействие, которое заключается в комплексной связи между содержанием отдельных учебных дисциплин, посредством которых достигается внутреннее единство программы подготовки обучающихся.

В учебном плане образовательной программы определен перечень всех учебных дисциплин вузовского компонента и компонента элективных дисциплин, трудоемкость каждой учебной дисциплины в академических кредитах, последовательность их изучения, виды учебных занятий и формы контроля, итоговой аттестации. Актуально изучение бережливого производства и обеспечение безопасной условий трудовой деятельности на предприятиях АО «НК «КТЖ», АО «КЕГОС», АО «АЖК» и других предприятиях энергетического направления.

Образовательные траектории разработаны в соответствии с запросами энергетической отрасли.

Цель образовательной программы актуальна, сформулирована лаконично и раскрывает в себе результаты обучения. В описании дисциплин отражены содержание для достижения результатов обучения по образовательной программе 7М07166 – «Энергетические системы и энергоменеджмент». Также, в образовательной программе, разработанной на основе профессионального стандарта, отражены основные трудовые функции в компетенциях и результатах обучения, указаны виды связей с работодателями: проведение гостевых лекций ведущих топ менеджеров АО «НК «КТЖ», специалистов научных и проектных институтов. Таким образом, представленная на экспертизу образовательная программа 7М07166 – «Энергетические системы и энергоменеджмент» по направлению подготовки кадров 7М071 – «Инженерия и инженерное дело», полностью соответствует требованиям ГОСО, имеет четкую последовательность при разработке, отвечает современным запросам рынка труда, профессиональным стандартам и рекомендуется для подготовки кадров по образовательной программе 7М07166 – «Энергетические системы и энергоменеджмент» по направлению 7М071 – «Инженерия и инженерное дело».

Эксперт:

**Ассоциированный профессор кафедры «Энергетика», НАО
«Казахский национальный исследовательский технический
университет имени К.И.Сатпаева»**


Жуматова А.А.

«26» 02 2025 г.

РЕЦЕНЗИЯ

на образовательную программу 7М07166 – «Энергетические системы и энергоменеджмент»
по направлению подготовки 7М071 – «Инженерия и инженерное дело»

Актуализированная Образовательная программа 7М07166 – «Энергетические системы и энергоменеджмент» содержит следующую информацию: паспорт и структура Образовательной программы, компетентностная модель выпускника, где приведен полный перечень компетенций, которыми должен обладать выпускник в результате освоения дисциплин по данной образовательной программе, рабочий учебный план, а также каталог вузовского компонента и компонента элективных дисциплин.

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

В учебном плане образовательной программы определен перечень всех учебных дисциплин обязательного компонента и компонента по выбору, трудоемкость каждой учебной дисциплины в кредитах, последовательность их изучения, виды учебных занятий и формы контроля. Каталог элективных дисциплин, Каталог вузовского компонента полностью отражают преемственность дисциплин.

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

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

Образовательная программа предусматривает научную подготовку обучающихся в виде исследовательской практики и научно-исследовательской работы докторанта. Содержание практик свидетельствует об их способности сформировать исследовательские навыки обучающихся.

Для разработки образовательной программы были привлечены опытные и ведущие представители профессорско-преподавательский состав.

Заключение:

В целом, рецензируемая образовательная программа отвечает основным требованиям ГОСО, национальной рамке квалификаций, отраслевой рамке квалификаций, профессиональных стандартов и способствует формированию общекультурных и профессиональных компетенций по направлению подготовки 7М071 – «Инженерия и инженерное дело»

Рецензент:

Заведующая кафедрой «Автоматизация и электроэнергетика на транспорте», МТГУ

Оралбекова А.О.

«18/05» 2025 г.

РЕЦЕНЗИЯ

на образовательную программу 7М07166 – «Энергетические системы и энергоменеджмент»
по направлению подготовки 7М071 – «Инженерия и инженерное дело»

Реализация образовательной программы 7М07166 – «Энергетические системы и энергоменеджмент» осуществляется посредством последовательности изучаемых дисциплин, с установлением конкретных задач и целевых индикаторов. Четко прослеживается междисциплинарное взаимодействие, которое заключается в комплексной связи между содержанием отдельных учебных дисциплин, посредством которых достигается внутреннее единство программы подготовки обучающихся.

Актуально изучение бережливого производства и обеспечение безопасной условий трудовой деятельности на предприятиях АО «НК «КТЖ», АО «KEGOC», АО «АЖК» и других предприятиях энергетического направления. Образовательные траектории разработаны в соответствии с запросами энергетической отрасли.

В структуре программы гармонично сочетаются теоретические знания и практические навыки, что обеспечивает комплексное освоение дисциплин, связанных с энергоменеджментом, энергетической безопасностью, возобновляемыми источниками энергии и инновационными технологиями в энергетике. Особое внимание уделено развитию компетенций по управлению энергоресурсами и снижению энергозатрат, что отвечает современным экономическим и экологическим вызовам.

Учебный план программы включает современные методы обучения, использование специализированного программного обеспечения и проведение исследовательской работы, что способствует формированию критического мышления и инновационного подхода у обучающихся. Подготовка кадров по данной программе позволит выпускникам успешно реализовывать проекты в области энергетики, способствовать развитию устойчивой энергетической инфраструктуры и внедрению энергоэффективных решений. Таким образом, представленная на экспертизу образовательная программа 7М07166 – «Энергетические системы и энергоменеджмент» по направлению подготовки кадров 7М071 – «Инженерия и инженерное дело», полностью соответствует требованиям ГОСО, имеет четкую последовательность при разработке, отвечает современным запросам рынка труда, профессиональным стандартам и рекомендуется для подготовки кадров по образовательной программе 7М07166 – «Энергетические системы и энергоменеджмент» по направлению 7М071 – «Инженерия и инженерное дело».

Рецензент:

Ассоциированный профессор кафедры «Энергетика»,
Satabayev university

Хидолда Е.

«13 03»

2025 г.



