NJSC SHAKARIM UNIVERSITY OF SEMEY

DEVELOPMENT PLAN
EDUCATIONAL PROGRAM

7M05302 - Technical physics

Semey

NJSC Shakarim University of Semey city

APPROVED BY

Member of the Board – Vice-Rector for Academic Affairs _____ I. Oralkanova
«26» 05 2023 yr.

EDUCATIONAL PROGRAM DEVELOPMENT PLAN
7M05302 – «Technical physics»
for 2023-2025 years

Semey 2023

Content

1. Passport of the Development Plan for bachelor's/master's degree programs _7M05302 – «Technical physics »

(name of the EP)

1	Basis for development	Shakarim University Strategic Plan for 2021-2025. Faculty work plan
2	Implementation period	2023-2025
3	Expected results of implementation	Training of competitive specialists with deep fundamental knowledge in the field of technical physics, able to work in modern conditions of rapidly changing technologies and a sharply increasing volume of information.

2. Analytical justification for the EP

2.1 Information about the educational program

The educational program is developed in accordance with the National Qualifications Framework and Occupational Standards, in accordance with the Dublin Descriptors and the European Qualifications Framework. The typical period for completing a master's degree program is 2 years.

The EP «7M05302 – “Technical Physics" was developed by the Academic Committee

Considered at a meeting of the Quality Assurance Commission of the engineering-technological faculty (Minutes №. 4/6 of 04/10/2023).

Approved at a meeting of the University Academic Council (Minutes №. 8 of 04/25/2023).

The main criterion for the completion of the educational process is the completion of at least 120 credits, with the award of _____Master of Science degree_____.

Training in the educational program 7M05302-Technical Physics is carried out at the Shakarim University of Semey at the Department of Technical Physics and Thermal Power Engineering of the Faculty of Engineering and Technology. When implementing the educational program, the peculiarities of master's training characteristic of the Shakarim University of Semey and the region were taken into account - these are the educational trajectories of “Nuclear Reactors and Power Plants”, “Engineering and Low Temperature Physics” and “Medical Physics”. The uniqueness of this educational program lies in the fact that the training of specialists in this field is carried out in close cooperation with the National Nuclear Center of the Republic of Kazakhstan and the Center for Nuclear Medicine and Oncology in Semey. These areas of specialization in the territory of the Republic of Kazakhstan are carried out only at the Shakarim University in Semey. Assessment of the quality of training of future specialists within the framework of dissertation defenses is carried out at on-site meetings of the certification commission on the basis of the department’s branch in the National Nuclear Center of the Republic of Kazakhstan (Kurchatov) and the Center for Nuclear Medicine and Oncology in Semey.

2.2 Information about students

Academic year / Basics of training	2023-2024 academic year	2024-2025 academic year
Grant	5	5
Agreement	2	2
Total	7	7

2.3 Internal and external conditions for the development of educational programs

The academic policy of the department “Technical Physics and Thermal Power Engineering”, which implements the EP “Technical Physics”, is aimed at the use of innovative teaching technologies based on best practices in teaching basic and core disciplines, on the quality of teaching using modern teaching strategies, modern teaching methods in higher education. Master's students and teaching staff of the Department of “Technical Physics and Thermal Power Engineering” have unlimited access to information and educational resources and electronic library systems necessary to carry out independent educational and research work. Information electronic resources: full access to databases - Scopus, ScienceDirect, Electronic library system "Polpred", Cyberleninka, Presidential Library. B.N. Yeltsin.

The educational and laboratory classrooms of the Department of “Technical Physics and Thermal Power Engineering” are equipped with modern equipment and comply with current sanitary standards, fire safety requirements, and qualification requirements for the activities of educational organizations. Some disciplines are held on the basis of a branch of the department at the RSE National Nuclear Center of the Republic of Kazakhstan.

The auditoriums of the Department of “Technical Physics and Thermal Power Engineering” are connected to the WI-FI network for holding online conferences, lectures, and seminars with the participation of leading scientists from Kazakhstan, near and far abroad. There is a portal of educational resources of the University named after Shakarim of Semey (http://ais.semgu.kz/), which contains lectures, videos, hyperlinks, tasks for self-testing, presentations on topics, tutorials and other educational and methodological content on the studied disciplines of the EP, the content of which the teaching staff applies in the classroom, and to which students have round-the-clock access.

All types of practices implemented within the framework of the EP take place on the basis of the National Nuclear Center of the Republic of Kazakhstan, the Center for Nuclear Medicine and Oncology in Semey, and the Institute of Nuclear Physics in Almaty.

Practice bases meet the requirements and content of practice.

2.4 Information about teaching staff implementing the educational program

The teaching staff of the department “Technical Physics and Thermal Power Engineering”, ensuring the implementation of the EP “Technical Physics” is:

№	Indicators	Unit.	2023-2024 academic year	2024-2025 academic year
1	Share of teaching staff with an academic degree in EP	%	**100**	**100**
2	Including the share of teaching staff with an academic degree in a cycle of basic disciplines	%	**100**	**100**

The Department of Technical Physics and Thermal Power Engineering carries out the educational process at three levels of study: bachelor's, master's and PhD doctoral studies. The formation of scientific and pedagogical personnel at the department is carried out through training through master's programs, PhD doctoral studies, and advanced training of teaching staff.

EP teachers undergo advanced training at leading universities in Kazakhstan (according to plan of the Faculty of Advanced Training) and training seminars conducted by the Ministry of Science and Higher Education of the Republic of Kazakhstan, universities and other organizations.

The teaching staff of the EP “Technical Physics” takes part in competitions for grant funding, program-targeted financing of projects, which are administered by the Ministry of Education and Higher Education of the Republic of Kazakhstan, the development institutes of the teaching staff of the department have high scientific and methodological publication activity. The results of the scientific activities of teachers are reflected in scientific publications with an impact factor. Scientists of the Department of Technical Sciences and Technology have the Hirsch index (h-index) in the Web of Science and Scopus databases.

2.5 Characteristics of EP achievements

In 2020, the EP “Technical Physics” successfully passed specialized accreditation with the ARQA agency for a period of 5 years (Registration number HE – SA – 000130 dated July 2, 2020).

3. Main objectives of the EP development plan

In accordance with the Strategic Development Plan of the University, the following tasks have been identified for the effective implementation of the EP “Technical Physics”:

- Development and implementation of scientific projects
- Development of human resources
- Strengthening the material and technical base
- Development of international cooperation

The expected final results include: participation in funded grant projects, publication activity of teaching staff in rating publications with a non-zero impact factor, development and operation of joint educational programs with foreign universities, implementation of scientific research results in the educational process, involvement of students in scientific research, academic mobility students and teaching staff.

4. Risk analysis of the EP

Identification and assessment of risks of the EP "Technical Physics" is carried out in accordance with the Strategic Development Plan of the University until 2025. The mechanism for monitoring possible risks of the EP "Technical Physics" is surveys and questioning of students' satisfaction with the organization of the educational process, the quality of teaching, and the material and technical base. Employers' questionnaires are systematically monitored to assess the quality of specialist training. The results of the survey and monitoring of EP risks are analyzed and used in the future when updating educational programs.

№	Name of risks	Corrective measures
1	Decrease in the number of students in the EP	Strengthen career guidance work
2	Insufficient development of external and internal academic mobility of students and teaching staff	Identification of universities for academic mobility of master's students and conclusion of agreements
3	The risk of reducing the degree of teaching staff in the EP	Develop a system of support and incentives for teaching staff
4	Changing student needs and priorities	Increasing the level of material and technical equipment of the department and increasing the prestige of postgraduate education on the part of employers.

5. Action plan for the development of EP

№	Criteria	Expected results	Units	2023-2024		2024-2025	
				Plan	Actual Execution	Plan	Actual Execution
Direction 1. Educational and methodological support							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational Program "Technical Physics" in order to increase practice orientation and develop professional competencies of graduates	fact.	When the standard changes		When the standard changes	
1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies and labor market demands	Improving the quality of the content of educational programs by including elective courses aimed at developing key and professional competencies of graduates in accordance with the demands of the labor market.	fact.	At the request of employers		At the request of employers	

1.3	Introduction into the educational process of modern teaching technologies that contribute to the development of cognitive activity and communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	fact.	+		+	
1.3.1	Introduction into the educational process of massive open online courses (MOOCs) in the educational program__Technical Physics_	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	unit	-		-	
1.4	Involving social partners and employers in the development and examination of the implementation of educational programs	Improving the quality of implemented educational programs taking into account market demands and employer recommendations	unit	**2**		**2**	
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit	-		-	
1.6	Conducting seminars and round tables on the use of innovative technologies in the educational process	Introduction of innovative technologies into the educational process	unit	-		**1**	

1.7	Publication of educational, educational and methodological, scientific literature on implemented educational programs	Improving educational and methodological support in the disciplines of implemented educational programs	unit	-		**1**	
1.8	Concluding agreements with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a base of foreign and domestic universities - partners for the development of academic exchange of students of all levels and teaching staff	unit	-		-	
1.9	Inviting students from partner universities to study for a semester, short-term internships, practice, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	person	-		-	
1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the field of Technical Physics	person	-		-	
1.11	Development of outgoing academic mobility of teaching staff and students in the field of Technical Physics	Improving the educational program based on the experience of implementing similar programs in leading foreign universities	person	-		-	
Direction 2. Teaching staff							
2.1	Increasing the professional level and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have undergone advanced training at the republican and international level is at least 20%	person	**1**		**1**	

2.2	Completion of advanced training, retraining, internship of teaching staff at the international level	Completion of at least 2 teachers in advanced training, retraining, and internship programs for teaching staff at the international level	person	**2**		**2**	
2.3	Promotion of publications of teaching staff works in international publications indexed by the Web of Science and Scopus databases	Increasing the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases - at least 30% of the total number of teaching staff	%	**30**		**30**	
2.4	Involving specialists from the practical field of activity in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	**20**		**20**	
Direction 3. Internationalization of educational programs							
3.1	Concluding agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships for students	unit	**-**		**-**	
3.2	Attracting foreign students to study in the educational program “Technical Physics”	Increase in the number of foreign students	person	**-**		**-**	

3.3	Organization of joint scientific and practical events with international partners	Increasing the efficiency of scientific and scientific-methodological activities of teaching staff, exchange of experience with foreign partners	unit	**1**		**1**	
3.4	Inviting foreign specialists to give lectures and provide consultations on master's projects and dissertations	Improving the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	unit	**1**		**-**	
3.5	Expanding cooperation with leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	person	**1**		**-**	
Direction 4. Logistical support and digitalization							
4.1	Stage-by-stage equipment of classrooms with technical teaching aids (projectors, panels, interactive and multimedia boards, multifunctional devices, webcam, projector screen, etc.)	Equipping classrooms assigned to the department with technical teaching aids (projectors, panels, interactive and multimedia boards, multifunctional devices, webcam, projector screen, etc.)	unit	**-**		**-**	

4.2	Carrying out automation of the educational process (testing, session management, student movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	Information management based on automation of the educational process (testing, session management, student movement, dean's office, department, teaching load, schedule, library, syllabuses)	fact.	+		+	
4.3	Replenishment of the full-text database of scientific research results of teaching staff and students, teaching staff (articles, monographs, etc.)	Increasing the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	unit.	**5**		**5**	
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for ongoing educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	%	**10**		**10**	
4.5	Monitoring the content and improvement of the faculty website	Formation of the faculty website on various aspects of the implementation of educational programs.	%	**20**		**20**	

Head of the Department _____ **Stepanova O.**

REVIEWED
at a meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology
Minutes of meeting No. 5 dated May 25, 2023
Chairman of the QAC _____ Abdilova G.

AGREED

Dean of the Faculty _____ Nurimkhan G.

"26" May 2023