



DEVELOPMENT PLAN

EP "7M07306 Geospatial digital Engineering"

1 General information

The EP "7M07306 Geospatial Digital Engineering" was developed in accordance with the National Qualifications Framework, aligned with the Dublin Descriptors and the European Qualifications Framework, and designed based on a modular system for studying disciplines that form general cultural and professional competencies.

The individuality and uniqueness of the EP "7M07306 Geospatial Digital Engineering" consists in in-depth training of specialists in the field of spatial analysis, digital mapping and automated land management using artificial intelligence and machine learning. The program focuses on the development of research competencies and the creation of innovative solutions for geodesy, infrastructure monitoring and natural resource management based on remote sensing data and GIS technologies.

2 Planning the educational program

Planning and management of the educational program of the EP "7M07306 Geospatial Digital Engineering" is carried out on the basis of priority areas and strategic goals of K.I. Satpayev KazNTU (<https://official.satbayev.university.ru/university/mission-strategy>) and the O.A. Baikonurov Mining and Metallurgical Institute, reflecting the vision, mission, strategic directions and key performance indicators (<https://official.satbayev.university.ru/mining-metallurgy>).

3 The purpose of EP development

The purpose of the educational program is to train highly qualified scientific, technical and engineering personnel in the field of geodesy, geoinformatics, geospatial digital technologies, with the aim of ensuring the openness, security, resilience and environmental sustainability of cities and towns.

4 Objectives of OP development

Task 1: The readiness of specialists for research and design work in the field of geodesy, cartography, geoinformatics, surveying and land management, including in related fields related to the selection of necessary research methods, modification of existing and development of new methods based on the objectives of a specific study.

Task 2: The readiness of specialists for production and technological activities that ensure the introduction of new digital developments at the local level.

Task 3: The willingness of specialists to search for and obtain new information necessary to solve professional tasks in the field of knowledge integration in relation to their field of activity, to actively participate in the activities of an enterprise or organization.

Task 4: The readiness of specialists for scientific, informational, ideological and

problematic communications in a professional environment and in a non-specialist audience with a clear and in-depth justification of their position, engage in organizational, managerial and service activities, and be aware of responsibility for making their professional decisions.

Task 5: The readiness of specialists for self-study and continuous professional development throughout the entire period of scientific or professional activity.

5 Risks of EP implementation (SWOT analysis)

<i>S (strength) – strengths (potentially positive internal factors)</i>	<i>W (weakness) – weaknesses (potentially negative internal factors)</i>
<ol style="list-style-type: none"> 1. Brand awareness of the university; 2. Positive image in the educational services market of the Republic of Kazakhstan; 3. Availability of opportunities and experience of using interactive technologies in the educational process based on modern information technologies; 4. Availability of information systems for determining borrowing in order to implement the principles of academic integrity; 5. Availability of partnerships and cooperation agreements with scientific organizations and foreign universities 6. Dynamically developing material and technical base and high level of informatization of the educational process. 7. Increasing the classroom fund and equipping it with modern technical facilities 8. Availability of sufficient book stock in libraries. 9. The provision of the UMKD of the entire complex of disciplines of the OP department. 10. Stable financial position 11. Involved teaching staff with experience in the scientific and educational field and production 12. Conducting classes on the bases of the department's branches. 13. Increasing the quality of the department staff 	<ol style="list-style-type: none"> 1. Insufficient volume of scientific work on a contractual basis; 2. Unmet need for a dormitory. 3. The lack of licenses to carry out a number of specialized works, which narrows the university's ability to participate in tenders. 4. Low commercialization rate. 5. Poor communication with regional universities.
<i>O (opportunity) – favorable opportunities (potentially positive external factors)</i>	<i>T (threat) – threats (potentially negative external factors)</i>
<ol style="list-style-type: none"> 1. High demand for highly qualified scientific and pedagogical staff; 2. Introduction of new courses and disciplines in accordance with the requirements of the labor market; 3. Conducting PR events, career guidance among applicants (bachelor's degree graduates). 4. Almaty is the largest financial, industrial, and socio-cultural center of the Republic of Kazakhstan, generating steady demand in the labor market. 5. Openness of mining and metallurgical and other manufacturing enterprises for cooperation with technical universities and provision of internship places. 6. The demand for graduates of accredited educational institutions in the labor market. 	<ol style="list-style-type: none"> 1. Increase in the cost of equipment due to inflationary costs; 2. Reducing the financial capacity of enterprises to allocate funds for research and development and conclude housing contracts. 3. Unstable level of automation of business processes during the UNT 4. Insufficient quality of information services provided by Internet providers in rural districts 5. Insufficient fundamental training of applicants entering the university and poor knowledge of foreign languages by applicants

Long-term action plan for the development and improvement of the educational program

	Event content	Responsible performers	Deadlines for execution
1	Study and analysis of the competitive environment, disclosure of the department's capabilities to enhance the image and attractiveness of the educational institution for consumers (applicants, students, parents, business partners) of educational services	Head of the Department, teaching staff	2024-2027
2	The use of progressive marketing and digital technologies to promote distance education services	Head of the Department, teaching staff	2024-2027
3	Strengthening career guidance, attracting applicants through tripartite agreements	Directorate, Head of the Department, teaching staff	2024-2027
4	Involvement of teaching staff from among stakeholders in the educational process	Head of the Department, teaching staff	2024-2027
5	Development and implementation of digital interactive forms of learning, a combination of theoretical and practical methods and forms of learning	Head of the Department, teaching staff	2024-2027
6	Preparation of an educational program for specialized accreditation for compliance with education and agency quality standards	Head of the Department, teaching staff	2024-2027
7	Provision of all types of disciplines with textbooks, teaching aids, educational and methodical complexes with digital remote support, electronic educational materials, multimedia educational resources	NB, Head of the Department, teaching staff	2024-2027
8	Development and use of case databases, training thematic computer programs in the field of GCI	Head of the Department, teaching staff	2024-2027
9	Conducting seminars and master classes and mastering digital forms of teaching with the participation of IT specialists	Head of the Department, teaching staff	2024-2027
10	Development of new forms of students' independent work, as well as electronic control materials for self-examination	Head of the Department, teaching staff	2024-2027
11	Conducting seminars using students' volunteer activities, seminars and master classes to improve knowledge and teaching methods in collaboration with stakeholders, public foundations, non-governmental organizations, research institutes and other universities	Head of the Department, teaching staff	2024-2027
12	Development of a digital rating system for verifying students' knowledge, ensuring the accessibility of assessments	OR, DAV, Head of the Department, teaching staff	2024-2027
13	Ensuring the participation of teachers and students in interuniversity and international conferences, as well as in competitions held by the Ministry of Education and Science of the Republic of Kazakhstan	Head of the Department, teaching staff	2024-2027

14	The development of scientific schools, the introduction of teaching staff's own research into the educational process in the field of teaching methods of academic	Head of the Department, teaching staff	2024-2027
15	Conducting effective positioning of scientific research in the intellectual property market	Head of the Department, teaching staff	2024-2027
16	Attracting foreign scientists with a high h-index	Head of the Department, teaching	2024-2027
17	Development of educational programs of the department	DAVID, Head of the Department	2024-2027
18	Regular professional development of teaching staff and students	HR, Head of the Department, teaching	2024-2027
19	Strengthening the material and technical base	Directorate, Head of the Department	2024-2027
20	Internal and external academic mobility of teaching staff and students	Directorate, Head of the Department	2024-2027
21	Expanding multilingual education	Directorate, Head of the Department	2024-2027
22	Development of the MOE in the disciplines of the OP and for additional training	Directorate, Head of the Department	2024-2027
23	Submission of an application for a grant financing competition for scientific and scientific-technical projects	Directorate, Head of the Department, teaching staff	2024-2027
24	Ensuring safe and comfortable working conditions, education and extracurricular activities for students	Directorate, Head of the Department	2024-2027
25	Development of an action plan with Associations and enterprises in the field of GCI	Directorate, Head of the Department	2024-2027
26	Development of an action plan for the expansion of external and internal mobility of students of the Faculty and faculty of the department, using modern distance learning technologies	Head of the Department, teaching staff	2024-2027
27	Organization of work on effective employment of graduates. Creation and development of an alumni community.	Head of the Department, responsible for employment and career guidance	2024-2027
28	Formation of a fund of educational and scientific literature in the framework of the training area	Deputy Dean for Scientific Work, Head of Department, teaching staff	2024-2027
29	Equipping classrooms with new computer equipment and other equipment, software	Head of the Department, teaching staff	2024-2027

Reviewed at the meeting of the Department MSaG Protocol №3 dated September 18, 2024.

Head of the Department MSaG



Meirambek G.

Development plan
 OP with specification of strategic planning indicators, reflection of risk analysis and assessment, implementation of activities depending on identified risks, guarantees of achievement of planned results

№	Target indicators	Unit of measurement	Risks				Strategies	Guarantees
			2023-2024	2024-2025	2025-2026	Analysis and evaluation		
1	Percentage of employed graduates in the first year after graduation	%	90	95	97	Loss of connection with a graduate	Cooperation with stakeholders and business partners. Graduate Feedback.	Contact information with graduates, business partners, and stakeholders. Employment of graduates. Internal audit
2	Number of joint educational programs	Quantity	0	0	1	Organization analysis The educational process in foreign universities and the assessment of the possibility of creating a SOP.	Cooperation with National and foreign scientific centers, institutes and universities. Involvement of highly qualified teaching staff in the work. To evaluate key learning performance indicators, develop and implement additional assessment methods. Develop an action plan for external and internal mobility of students and teaching staff	Risk-based analysis (SWOT) on implemented OP. Conclusion of contracts, approval and opening of OP, admission of students to new OP. Internal audit.

3	Number of educational programs in English	Quantity	0	0	1	Insufficient English language skills of the teaching staff	Organization and holding of English language courses among teaching staff at the University	Availability of international certificates for the assessment of English language proficiency Teaching staff and students. Internal audit. Semi-annual and Annual reports of departments Digital resources of the university. Internal audit.
4	Increasing the recruitment rate for distance education	Quantity	25	30	40	Poor awareness of applicants	To activate career guidance work. To intensify work on external and internal academic mobility of teaching staff using modern distance learning technologies	
5	Development and implementation of educational, teaching materials reflecting the results of our own research and the best international practices	Quantity	4	6	8	Insufficient implementation of the results of research and development of teaching staff in the development of educational and teaching materials	To consider at the meeting of the department issues related to the development and implementation of teaching staff's own research in the field of teaching methods and to develop methodological guidelines on the subjects taught based on teaching staff's own research.	Teaching staff with high qualifications and extensive experience in scientific and pedagogical activities. F KazNITU 703-06. The annual plan of educational and methodical publications. Internal audit

6	The share of updating the scientific equipment fleet from the total number of scientific equipment, %*	Quantity	15	20	25	Increased cost of equipment due to inflationary costs	Opening and equipping of the scientific and educational laboratory on GCI	Conducting laboratory classes in accordance with the RUP OP
7	Increase in security documents and copyright certificates*	Quantity	13	15	20	Insufficient patenting of research and development results	Participation of staff and Students participating in competitions for grant financing of the Ministry of Education and Science of the Republic of Kazakhstan	Patenting of scientific developments. Patent Department
8	The number of teachers who speak English at a level sufficient for conducting scientific and educational activities	Quantity	3	3	5	Older teaching staff have poor English language skills	Organizing and conducting English language courses at the university among older teaching staff	Availability of International certificates for the assessment of English language proficiency Teaching staff and students.
9	The proportion of settled teaching staff involved in scientific research and development work, %	Quantity	76	78	80	The percentage of science funding in Kazakhstan is one of the lowest in the world (0.13% of GDP)	Activate participation of Teaching staff in competitions for grant financing of the Ministry of Education and Science of the Republic of Kazakhstan	Teaching staff with high qualifications and extensive research experience.

10	Number of publications in scientific publications of the Republic of Kazakhstan recommended by COXON of the Ministry of Education and Science of the Republic of Kazakhstan	Quantity	9	12	14	Lack and insufficient funding of scientific research	Activate participation in research and development	Teaching staff with high qualifications and extensive research experience. Published scientific articles
11	Number of scientific projects carried out	Quantity	4	5	6	The percentage of science funding in Kazakhstan is one of the lowest in the world (0.13% of GDP)	Activate participation in Teaching staff competitions for grant financing of the Ministry of Education and Science of the Republic of Kazakhstan	Teaching staff with High qualifications and extensive research experience.
12	The number of scientific research results introduced into the educational process	Quantity	4	5	6	Insufficient funding for scientific research	Development and implementation of research results in specialized disciplines of RUP.	The act of introducing research results into the educational process. Open classes.
13	The number of publications in foreign indexed by the international database Scopus / WoS	Quantity	12	16	18	Insufficient funding for scientific research	Activate participation in Teaching staff competitions for grant financing of the Ministry of Education and Science of the Republic of Kazakhstan	Teaching staff with high qualifications and extensive research experience.

14	The level of settlement of the teaching staff. %	%	71.5	73	75	Insufficient number of grants for the training of undergraduates and doctoral students	Training and hiring of new personnel who have successfully defended their master's and doctoral theses	Graduates receive academic and scientific degrees. Internal audit.
15	An increase in the proportion of teachers and researchers who have completed advanced training at home and abroad	%	90	95	98	Insufficient funding	Participation of staff in the Bolashak competition, organization of advanced training courses for teaching staff. Within the framework of the Industrial Advisory Council on OP, sign a Memorandum and develop, together with various Associations, an action plan for proper training of students for professional certification of OP.	Certificate of professional development. Internal audit

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