INDEPENDENT AGENCY FOR ACCREDITATION AND RATING

EXTERNAL PEER COMMISSION

Addressed to IAAR Accreditation Councils

Independent agency for accreditation rating

REPORT

about the results of the external peer commission work assessing the correspondence to the requirements of the standards of special accreditation of the D. Serikbayev East Kazakhstan State Technical University academic programs:
5B070500 – MATHEMATICAL AND COMPUTER MODELING
6M070500 - MATHEMATICAL AND COMPUTER MODELING
6M060100 - MATHEMATICS

Ust-Kamenogorsk
2015

According to the Independent Agency for Accreditation and Rating Order No.9-15 ODI of 30.04.2015, the external peer commission assessed the correspondence of the academic programs, to the standards of the IAAR accreditation in May 4-6, 2015 in D. Serikbayev East Kazakhstan State Technical University, Ust-Kamenogorsk. The report of the external peer commission (EPC) contains the assessment of the shown academic programs of the educational organization to the IAAR criteria, EPC recommendations for the further improvement of the programs and the parameters of D. Serikbayev EKSTU academic programs profile.

EPC membership:

1 The chairman of the commission – Pak Yuriy Nikolayevich, Doctor of Techn.Sc, Professor, Co-Rector for AMO, Karaganda State Technical University (Karaganda);

2 Foreign peer – Gostin Alexey Michaylovich, Candidate of Techn.Sc., an associate professor, the Director of New Information Technologies Center of Ryazan State Radio and Technical University, a peer of "Peer Guild in the Sphere of Vocational Education (Ryazan, the Russian Federation);

3 Foreign peer – Grakovskiy Alexandr Vladimirovich, Professor, the dean of the department of Computer Sciences and Electronics, the Institute of Teansport and Communication (Riga, Latvia);

4 Peer – Khamrayev Sheripidin Itakhunovich, Cand. of Techn.Sc., Professor of the sub-department "Theoretical and Experimental Physics", deputy director of the Institute of Mathematics, Physics and Computer Science, Abay Kazakh National Pedagogical University (Almaty);

5 Peer – Smirnov Mikhail Borisovich, Cand. of Techn.Sc., Professor, head of methodological department of Shakarim State University (Semey);

6 Peer – Yensenbayeva Marzhan Zaitovna, Cand.of Phys-Math.Sc, and associate professor, head of QMS Coordination department of K.Satpayev Kazakh National Technical University (Almaty);

7 Peer – Karsybayev Yerzhan Yertayevich, Doctor of Techn.Sc., Professor of the sub-department " Lifting-and-Shifting Machines and Hydraulics", K.Satpayev Kazakh National Technical University (Almaty);

8 Peer – Akhmedyanov Abdulla Ugubayevich, Cand.og Techn.Sc., an associate professor of the sub-department "Standardization and Certification", L.Gumilev Eurasian National University (Astana);

9 Peer – Mustafayev Zhumakhan Suleymanovich, Doctor of Techn.Sc., an associate professor, head of the department "Melioration and Agricultural Science"of M. Dulaty Taraz State University (Taraz);

10 Employer – Kizeyeva Viktoriya Vladimirovna, acting head of the department for work with the educational institutions of the Board of Training and Development of LLP "Kazzink" Personnel (Ust-Kamenogorsk);

11 Student – Zhakupova Nazgul Aydynovna, graduate course student, 2 year, speciality 6M010900 – "Mathematics", S. Amanzholov East Kazakhstan State University (Ust-Kamenogorsk);

12 The Agency observer – Kanapyanov Timur Yerbolatovich, the Agency International Projects manager (Astana);

13 The Agency observer – Sadykova Aliya Mukhtarovna, the Agency Information-Analytical Project manager (Astana).

Contents

1 D. SERIKBAYEV EAST KAZAKHSTAN STATE TECHNICAL UNIVERSITY PRESENTATION

D. Serikbayev East Kazakhstan State Technical University (EKSTU) is a higher educational institution having the juridical person status realizing professional academic programs of higher and post graduate education.

EKSTU has the necessary normative-juridical documents for the educational activity (Licence No. 12016669 of 02.11.2012 for the educational activity, EKSTU Regulations, the Package of Internal Normative Documents, professional academic programs).

The educational institution was founded in 1958 according to the Decree of the Ministry Councils of the USSR of August 5 No. 866 and the Decree of the Ministry Councils of the KSSR of August 30 No. 765, and it was named Ust-Kamenogorsk Civil and Highway Engineering Institute" (UKCHEI).

May 7, 1996 Decree of RK Government No. 573 reorganized UKCHEI into East Kazakhstan Technical University. It was by the Decree of RK Government, Rector's order No. 247 of 29.10.99 "About Establishing the Military Sub-Department at D.Serikbayev EKTU".

January 31, 2001 Decree of RK Government No. 163 renamed East Kazakhstan Technical University into Republic State government D. Serikbayev East Kazakhstan State Technical University.

In 2012 by the Decree of RK Government No. 544 of 28.04.2012 RSGE D. Serikbayev East Kazakhstan State Technical University was reorganized into Republican State Enterprise on the rights of econopmic management, D. Serikbayev East Kazakhstan State Technical University. Now EKSTU is one of the largest HEIs in Kazakhstan. There are 5 departments, 28 sub-departments.

EKSTU has certified QMS. NQA Certificate (Great Britain) is in action till May 28, 2015

In 2014 D. Serikbayev EKSTU successfully passed the accreditation procedure in the Independent Agency of Accreditation and Rating (IAAR) *(Certificate No.AA0018, of May 21, 2014.).*

In 2013-2014 academic year 13 *academic programs,* undergraduate and graduate, passed *international* specialized accreditation in ASIIN (e.V.) *and 20 academic programs* passed *national* specialized accreditation in NKAOKO.

10 undergraduate academic programs of D. Serikbayev East Kazakhstan State Technical University took the leading places in the academic programs rating according to the version of *Bologna Process and Academic Mobility Center of MES RK* in 2014. EKSTU takes the 4th position in the state HEIs rating of the number of prize places among the general number of applied undergraduate academic programs.

According to the results of RK HEIs ranging conducted by CBPAM 3 through (undergraduate-graduate-PhD) academic programs of EKSTU became among the three leaders.

Upon the results of the General rating of technical HEIs - 2014 (NKAOKO) *EKSTU took the 7th place.*

In IAAR-2014 rating *17 undergraduate academic programs, 16 graduate academic programs, 1 PhD program became among three leaders.*

Upon the results of the National Business-rating among the Republic of Kazakhstan enterprises "Sector Leader – 2014" D. Serikbayev East Kazakhstan State Technical University ***took the first prize (gold) in the nomination "Actives and Responsibilities Rates" among higher educational institutions in East Kazakhstan oblast*** and the ***13th place in the same nomination among the HEIs in the Republic of Kazakhstan (*** having entered into 40 top enterprises-leaders of the Republic of Kazakhstan in higher educational sphere according to state statistical rating of economy enterprises of their financial-economic activity ratings.

EKSTU is among 10 RK HEIs that train specialists for SPIID-2 realization in the area of mechanical engineering and metallurgy.

EKSTU conducts education activity in 84 academic programs, including: 41 undergraduate specialities, 36 – graduate specialities, and 7 – PhD specialities.

The HEI implemented the innovative mechanism of the graduates job placement monitoring based on the use of the information from Pension Payment State center. This allows to support credibility of the information about young specialists job placement.

According to data of East Kazakhstan oblast branch of Pension Payment State Center (PPSC) 87.3 % graduates of 2014 have been employed.

There poly-lingual groups in 7 academic programs there in the HEI.

There was established and has been developed the scientific-innovative structure uniting Techopark "Altay", business incubator "Bastau", 3 research institutes, 23 research laboratories, and 7 centers.

We notice the constant increase of research financing, the research have been carried out within the framework of state budget themes, and also to the order of enterprises and organizations. In 2014 252 agreements were concluded, general amount was 330,263.1 thousand KZ tenges.

An important rating of the research outcomes is the number of publications in the journals with impact factor. The number of publications in the rating journals with impact-factor higher than zero in 2012 included 28 papers in foreign high-rating journals, in 2013 there were 29 papers published, and in 2014 there were 33 papers published.

Today the university has 113 agreements about partner relations with foreign HEIs and organizations, within the framework of which we have foreseen the students, teachers exchange, joint educational and scientific-innovative activity.

The strategic partners of D. Serikbayev EKSTU are more than 100 foreign universities and organizations: JEOL company (Japan), Interactive Corporation (Japan), Micromine (Australia); Akita University (Japan), Munich Technical University (Germany), The Museum of Natural Sciences (Great Britain), Wroclaw University (Poland), Lublin Technical University (Poland), Otto von Guericke University (Germany), Klaustal Technical University (Germany), Moscow Institute of Steel and Alloys, the Institute of Computing Technology of SO RAS, Tomsk National Research Polytechnic University, Novosibirsk State Technical University, Siberian State Geodesy Academy, and others.

197 scientists from 14 countries (Russia, Ukraine, Hungary, Poland, Germany, the USA, Great Britain, Italy, Canada, Austria, Japan, Mongolia, Azerbaijan, and Kyrgyztan) were invited to the university through the Program of MES RK "Involving Foreign Scientists and Consultants in Leading HEIs of Kazakhstan" in 2014 26 foreign scientists visited the university through the Program.

Today EKSTU is a member of the consortiums of five TEMPUS scientific projects.

The Order of the Ministry of Education and Science of the Republic of Kazakhstan of December 19, 2014 No. 530 approved the membership of the board of guardians of the Republic State enterprise on the right of economy "D. Serikbayev East Kazakhstan State Technical University"

2 THE ACADEMIC PROGRAMS GENERAL ASSESSMENT

D. Serikbayev East Kazakhstan State Technical University carries out the activity according to:

- the Regulations of D. Serikbayev East Kazakhstan State Technical University of MES RK approved by the Order of the Committee of State Property and Privatization of the Ministry of Finances of RK of August 20, 2012. No. 806.
- State Licence for Educational Services No. 12016669, given 02.11.2012. by the Committee for Control in the Sphere of Education and Science of MES RK and Appendices:
- 5B070500, 6M070500 - MATHEMATICAL AND COMPUTER MODELING (№ 12016669, of 02.11.2012)
- 6M060100 - MATHEMATICS (№ 12016669, of 02.11.2012)

According to the IAAR rating in 2014 5B070500 - Mathematical and Computer Modeling – 2nd place, 6M070500 - Mathematical and Computer Modeling – 2nd place.

According to the CBP and AM rating of 2014 5B070500 - Mathematical and Computer Modeling - 2nd place.

The accredited academic programs are realized according to the State program of education development of RK for 2011 – 2020 years. State compulsory educational standards of RK, D. Serikbayev EKSTU Development Strategy for 2011-2020 years, the Strategic Plan of D. Serikbayev EKSTU Development for 2011-2015 years, the Strategic Plan of D. Serikbayev EKSTU Development for 2014-2018 years, the Plans of Corresponding Academic Programs Development.

The content of the academic programs was developed on the principle of continuity and succession taking into account modern achievements of science, engineering and production requirements.

The academic programs modules catalogs are annually renewed according to the employers recommendations.

The quality of undergraduates training is supported by the faculty high qualification, developed infrastructure, the use of modern teaching technologies and students progress control, integration of education, science and industry.

The being accredited academic programs content is shaped according to the requirements of SCES, we foresee studying general compulsory modules in the speciality, elective modules.

The academic programs 5B070500, 6M070500 - Mathematical and Computer Modeling, 6M060100 - Mathematics have the following strong points:

- module structure of the academic programs with the elements of competence approach; the academic programs foresee the opportunities of buildings the individual educational structures; in the academic programs we observe the balance of theoretical and practical modules; the academic programs management closely cooperates with the potential employers and representatives of work experience bases; the control forms are adequate to the shaped competences;
- the scientific library supports the access to the catalogs of Republic inter-university electronic library (RIEL)); multi-disciplinary electronic research platform Web of Knowledge (Thomson Reuters DB); virtual electronic library of dissertations and author's abstracts of the Russian State Library (RSL); Kazakhstan National Electronic Library; Polpred.com DB, Mass media review; “Paragraf” DB, scientific-engineering documentation;
- there the information-program complex SPORTAL functions (www.do.ektu.kz;), Electronic library, EKSTU web site www.ektu.kz, the system of corporative documentation using Directum software.

3 EPC VISIT DESCRIPTION

EPC work was based on the Program of Peer Commission for specialized accreditation of the academic programs visit in D. Serkbayev EKSTU in May 4 - 6, 2015 .

To get the objective information about the quality of the academic programs and all HEI infrastructure, clarification of the content of the self-assessment report, there were meetings with the rector, co-rectors, directors of the departments (administrative, academic, research and innovative activity, quality management system, production-economic, character building and social development, information technologies), heads of the departments (educational-methodological, registration office, post-graduation education, international cooperation, testing, library, educational-information technologies), the departments deans (Architecture and Civil Engineering, Information Technologies and Power Engineering, Mechanical Engineering and Transport), heads of the sub-departments, teachers, students, employers. 225 people took part in the meetings (Table 1).

Table 1 - The information about the employees and students who took part in the meetings with IAAR EPC

Participant category	Number
Rector	1
Co-rectors	3
Deans, heads of the sub-departments, heads of structural sub-departments	45
Teachers	20
Students	24
Graduates	73
Employers	59
Total	**225**

During EPC work they saw the HEI infrastructure:

- academic and scientific laboratories of the departments - Architecture and Civil Engineering, Information Technologies and Power Engineering, Mechanical Engineering and Transport, the sub-departments of information systems, mathematical and computer modeling, instrument making and automation of technological processes, rational use of water and air basin, heat and gas supply, transport and logistics, construction of buildings and structures and transport communications, geological museum, registration office, student hub, scientific library, computer classrooms.
- the following classes were visited according to the approved schedule:practical classes according to the time-table of the academic program 5B070500 – Mathematical and Computer Modeling (Group B-MKT-1, Dotsent Popova G.V.) in Software Tools for Information Processing and 6M060100 – Mathematics in Ring Theory (group 14-MMAK-2, Professor Khisamiev N.G.);
- the documentation of the sub-department realizing the accredited academic programs was studied;
- the work experience bases of the being accredited programs at LLP “Kazzink”, LLP “Tekhnoanalit” were visited .

The event planned during IAAR EPC visit supported the detailed acquaintance with the educational infrastructure of the university, material-technical resources, faculty and employees, students, employer representatives, graduates. These allowed the IAAR EPC members to assess independently the correspondence of the data presented in the reports of the academic programs self-assessment, the criteria of the specialized accreditation standards.

4 CORRESPONDENCE TO THE SPECIALIZED ACCREDITATION STANDARDS

1) "Academic Program Management" Standard

The management and development of the AP of specialties of higher and graduate education 5B070500 – Mathematical and Computer Modeling and 6M070500 – Mathematical and Computer Modeling, 6M060100 – Mathematics are carried out in accordance with the legal documents of the Republic of Kazakhstan and the MES, the development Strategy of D. Serikbayev EKSTU for 2011-2020, the University Development Programme for 2014-2016, Strategic Plan for the Development of EKSTU for 2011-2015.

Educational programs are designed in accordance with the SES of higher and postgraduate education, approved by the Government Resolution of the Republic of Kazakhstan and the relevant requirements of employers. The Commission pointed out sufficient level of provided quality educational services at the University, the adequacy of accredited educational programs to the requirements of modern society and the problems of industrial-innovative development of the region.

The planning of the educational process is represented by a structure of interlinked documents (curricula, AP modules directory, individual educational plans for students, working curricula of specialties) and a complex of different kinds of educational materials. To implement educational programs modules directories are developed annually that describe discipline modules with a brief indication of the content, pre - and post requisites. The structure and content of the curriculum correspond to the SES and relevant model curricula. The sequence of the study subjects is constructed using a system of pre - and post requisites. Programs and courses are designed at a proper scientific and methodological level.

The process and procedure for approval of educational programs are supported through the development of regulatory and administrative documentation and ensuring its availability to the team.

The management of the educational program is carried out in accordance with the requirements of:

– PR 042-1.01-2014 Rules of organization of educational process on credit technology of education at the University;
– EKSTU DP 701-I-2011 Management of educational-methodical work;
– EKSTU DP 702-I-2013 Undergraduate education in D. Serikbayev EKSTU;
– EKSTU DP 706-III-2013 Transfer and restitution of students in EKSTU.
– EKSTU DP 708-II-2014 Graduate education in D. Serikbayev EKSTU.
– EKSTU DP 709-I-2014 Academic mobility in D. Serikbayev EKSTU;
– EKSTU DP 805-VI -2013 Collection and analysis of information about customer satisfaction;
– EKSTU DP 807-II-2013 Interim control of knowledge of students;
– EKSTU DP 808-III-2013 Final monitoring and evaluation of knowledge of students;
– EKSTU DP 809-I-2014 Final assessment of students;
– EKSTU DP 811-I-2012 Internal monitoring of the quality of educational process.

5B070500 – Mathematical and Computer Modeling and 6M070500 – Mathematical and Computer Modeling, 6M060100 – Mathematics are aimed at aimed at meeting the needs of the state, employers and learners, aligned with national development priorities: the State program of education development of the Republic of Kazakhstan for 2011-2020, Kazakhstan Strategy -2050.

Epy implementation of the academic programs 5B070500 – Mathematical and Computer Modeling and 6M070500 – Mathematical and Computer Modeling, 6M060100 – Mathematics and their correlation with the vision and strategies is provided, first of all, by the system of planning.

The development plan of the AP is developed and discussed in the specialized sub-departments: Mathematical and Computer Modelling (meeting minutes No. 2 dated 17.09.13, No. 3 dated 16.09.14), Mathematics (Protocol No. 2 dated 23.09.14). In the formulation of the development

plan of EP Mathematics participated Khisamiev N. G., Tynybekova S. D. Mukasheva R. W., Rakhmetullina J. T. and employers (Madyarov M. N.– head of the Department of Mathematics, S. Amanzholov East Kazakhstan state University, Zhantasov J. Z. – head of the Department of Mathematical Modeling and Computer Technologies - S. Amanzholov East Kazakhstan State University, a graduate of the 2014 Master of Science, doctoral student of the first year Konyrhanova A. A.). For closer links with employers – specialized mathematical department of S. Amanzholov East Kazakhstan state University, AP 6M060100 – Mathematics introduces a second trajectory "Algebra and applied mathematics", taking into account the scientific direction of these departments and to prepare the graduate for admission to PhD in the above areas.

The content of the accredited graduate AP has been developed based on the principles of continuity with the previous levels of education; it ensures completeness of each educational stage and gives the ability to interrupt the education to enter the world of work or continue education.

An important factor is the availability of information systems and databases, the use of the Internet for information, the website contains information reflecting the activities of the University.

The official site of EKSTU, www.ektu.kz, operates in 3 languages: Kazakh, Russian, English. On the website there is the strategy, mission, information of scientific and educational nature – the structure, history and achievements of the University, information about undergraduate and postgraduate training, international programs.

The information-analytical complex for the management of the educational process is a set of information systems accompanying the whole cycle of the training process – from the formation of the contingent to the final evaluation of students.

Access to information - educational portal of EKSTU is provided via the Internet, the corporate network and the access terminals.

The internet-portal of the University contains the sections "About the University", "Education", "Faculties", "Science", "Unit", "Scientific library", "EEU", "Applicant", "Association of graduates "Altyn Besik"," "Student life," "Academic calendar", "Schedule", "Individual study plan" and others, as well as a link to educational portal "Dales".

With their help the staff and students of the University are informed of the implementation of the necessary actions and decisions, on the other hand, provide the administrative staff of the University the ability to track indicators of required for operational, tactical and strategic management of educational process.

Since 2013 educational portal EKSTU has been successfully integrated with a unified system of higher education of the Republic of Kazakhstan (ESUVO).

The University website and the pages of the departments provide information on the achievements towards the implementation of accredited educational programs, links to external publications. "Administration", "Faculties" pages present contact information of the management of the University, heads of departments and teachers, indicating the presence of a communication channel by which any interested party may make proposals for improving the operation of the AP, and also confirms the transparency and accessibility for students, parents and faculty of the educational programs.

To improve the quality of education the sub-departments update the content of the educational program taking into account the views of employers. In the 2013-2014 academic year, according to the results of joint work with LLP "Center for ecology monitoring" was introduced the discipline "Mesoscale models of weather forecast" for graduate program 6M070500 – "Mathematical and computer modeling" (minutes of the meeting of the Department of MIKM No. 22 dated 14.05.2013). The LLP "Sigma" wrote a review for the 2014-2015 academic year modular educational programme 6M070500 – "Mathematical and computer modeling".

The benchmarks for the development of educational programmes are structured according to the types and directions of activity and contain administrative, educational-methodical, scientific, educational, business, marketing and career-oriented types of work that are the base for planning, development and constant quality of services.

On the basis of the existing quality management system at the University level and departments is carried out regular monitoring of implementation and adjustment of plans for the development of educational programmes and their implementation. The implementation of the AP is accompanied by the collection and analysis of statistics on the population of students and alumni, resources, personnel, scientific and international activity and other areas and monitored the degree of achievement of planned results in accordance with the procedures of the QMS.

The feedback system has effective forms, focused on the students, employees and stakeholders. This is systematic meetings of the rector with the staff, the academic council of the faculty with the participation of senior management, the functioning of the institution of the supervisors, direct mail to the rector in the form of a box of complaints and suggestions, the blog of the rector on the University website.

Based on the analysis and evaluation of monitoring indicators the university develops preventive and corrective measures, the efficiency and effectiveness of which is reviewed at faculty meetings, and faculty Senate.

According to the data of the AP, the analysis of the needs of the market of educational services is carried out. The University annually organizes fairs, negotiating with the leaders of organizations on employment of graduates. The level of demand for graduates is used as an indicator of compliance training of graduates of social order and expectations of society, as an indicator of social protection and guarantees adaptation to the new socio-economic conditions.

Information on employment of graduates of an AP for 3 years are presented in table 2.

Table 2 – The AP graduate job placement in 2012-2014

AP	2012		2013		2014	
	Number of graduates	Employment, %	Number of graduates	Employment, %	Number of graduates	Employment, %
5B070500-Mathematical and Computer Modeling	4	100%	10	90%	9	78%
6M070500-Mathematical and Computer Modeling	3	100%	5	100%	4	100%
6M060100 – Mathematics	2	100%	–		4	100%

In general, the management of accredited academic programs meets the criteria-based estimates of the standard "Management of the academicprogram."

However, the experts draw attention to the need for further improvement of plans for the development of academic programs, a broader discussion of plans with all stakeholders in the educational process.

The strong points of the AP are:

– compliance of the priorities of research work implemented by teaching staff of the AP, with the national policy in the sphere of education, science and innovation development.

– efficient functioning of the system of information and feedback focused on students, employees, and stakeholders.

– availability of automated electronic systems of academic programs control.

The weaknesses of the AP are:

– the plan of the AP development is not fully consistent with the strategy and identity of the University;

– the stated objectives and results of 5B070500 "Mathematical and Computer Modeling" AP (research training) are more suitable for the graduate and not to the undergraduate program. The goals of the program are not aligned with the intended learning outcomes;

– insufficient representativeness of stakeholders involved in the formation and revision of the AP development plan;

– according to the stated learning outcomes 5B070500-"Mathematical and Computer Modeling" occupies a niche between academic programs in mathematics and information technology. Due to the scientific training and area of interest of the teaching staff of the specialized sub-department in the implementation of the program there is clearly a shift towards the training of specialists in the information systems operation that changes the goals and objectives of the program;

– lack of effectiveness of risk assessment mechanism of the implementation of the AP.

The Board recommends:

– *to conduct a comparative analysis of the compliance of the current educational programs development plans with: D. Serikbayev EKSTU Development Strategy until 2020, the Development Strategy of the Faculty of Information Technology and Power Engineering; and based on the obtained data to refine plans for the development of accredited educational programs;*

– *to align the objectives and learning outcomes of "Mathematical and computer modeling" AP;*

– *to selected as the main AP partners employer organizations – typical for graduates of this program. To establish contacts with them, to enter into agreements on internships. Primarily, this refers to enterprises and research and development organizations of the profile corresponding to the model of a graduate of the AP;*

– *to perform a risk assessment of the development of educational programs in accordance with the Development Strategy of D. Serikbayev EKSTU and to develop a mechanism to reduce them;*

– *to strengthen the cooperation and exchange of experience with domestic and foreign universities that implement such educational programs.*

EPC notes that by 17 criteria the University has a strong position, by 17 criteria - satisfactory position, 3 criteria require improvement.

2) «Specificity of the Educational Program» Standard

The implementation of the AP of this cluster is carried out by the sub-department of the Faculty of Information Technology and Power Engineering:

– "Mathematical and Computer Modeling" sub-department in the undergraduate 5B070500 and graduate 6M070500 programs in "Mathematical and Computer Modeling";

– "Higher mathematics" sub-department in 6M060100 Mathematics.

Implementation of educational programs in this cluster is aimed at the formation of professionally competent specialists who meet the qualification requirements and the needs of the labour market. Graduate educational programs provide the opportunity to build individual learning paths, taking into account the personal needs and capabilities of students.

At the design stage of programs the specialized sub-departments determine the model of a graduate of an AP. The model represents the totality of knowledge, skills and experience of their application in practice, integrated into professional and generic competencies that should be possessed by graduates of an AP.

The model of a graduate of a master AP is verified and validated by publications of the main scientific results of dissertations on AP 6M060100 – "Mathematics": 18 publications, including 3 in the scientific editions recommended by the Committee on Control in Education and Science of the MES, 5 in the materials of international scientific-technical conferences, 8 in the proceedings of the Republican scientific-technical conferences and 2 in materials of regional scientific-practical conferences, the participation of graduate students in the Republican contest for the best master thesis (diploma of the 1 degree of the MES RK).

The study of requirements of employers in Ust-Kamenogorsk (city and surrounding areas), determines the content of educational programs. In the development of undergraduate AP 5B070500 and graduate 6M070500 "Mathematical and Computer Modeling" took part: head of centre of information technologies of JSC "ULBA metallurgical plant" A. Kovalev, technical Director of LLP "Company COP" J. Drat, HR Director of JSC "ULBA metallurgical plant", E. Denisova, Director of the company "1C-Rating" Dmitry Andrushechkin. The list of training courses is regularly reviewed tailored to the needs of employers. After analyzing the needs of employers, alumni testimonials, and given the existing directions doctoral AP 6D060100 – Mathematics one of which is "Computational mathematics" in graduate AP 6M060100 – "Mathematics". The Staff of the sub-department developed elective courses such as, "Algebraic methods of information technology", "Asymptotic methods in analysis", "Mathematical programming", "Numerical methods for solving differential equations", etc.

Experts draw attention to the need to ensure representativeness of attracting employers to the design and implementation of the AP.

Basic and profile disciplines include modern achievements of science, engineering and technology management in the field of study.

The accredited educational programs provide for the construction of individual educational trajectory, taking into account the personal needs and capabilities of students. Planning educational path (by discipline) is carried out in accordance with the academic calendar.

The content, volume, logic of construction of an individual educational trajectory of a student is based on a correctly composed modular educational program of a particular occupation based on the level of the educational cycle.

EKSTU developed P EKSTU 701.03-I-2013 "Development of a modular educational program", which identifies the basic requirements for the modular structure of the educational program.

The freedom of choice of subjects is realized through providing the learner with a discipline module directory at the choice of the trajectory of the course. The procedure for elective courses majors in electronic form is organised by the office of the Registrar, with the methodological and Advisory assistance to advisors and departments. Advisors conduct consulting work with the students on the choice of subjects and teachers two weeks before the recording started.

The sequence of the study subjects is considered in the structure and content of the curriculum, and built using a system of pre - and post requisites.

The educational programs include the components necessary for the development of intellectual, social and personal, academic and professional competences of bachelors. These components contain compulsory and elective subjects of profiling cycle. In master's degree educational programs there are educational, scientific, professional and practical components Practical part of an AP is implemented through laboratory practical classes, teaching, and industrial practice of students.

The content of accrediting educational programs in the field is developed in accordance with the requirements of the scientific, theoretical and practical areas of professional and social competence. Working curriculum of all established standards of education and practices, and the amount of time to conform their conduct to the standards.

The members of the EPC conducted interviews with faculty, employers, alumni and students of different years. Employers were present at the meeting, Simolin C. V. (head of group programming PC Kazzinc-Automation LLP Kazzinc), Madjarov M. N. (head the Department of Mathematics East Kazakhstan state University. S. Amanzholov), Zhantasov J. Z. (head the Mathematical modeling Department of computer technologies" S. Amanzholov East Kazakhstan state University), Levykin N. In. (Deputy Director on scientific work of the Regional specialized school-Lyceum for gifted children in mathematics, physics and Informatics), Temirbekov N. M. (Dean of the faculty of mathematics, physics and technology S. Amanzholov East Kazakhstan state University), Shevchenko V. V. (technical Director of LLP "center of ecological monitoring"), Akhmetov D. S. (Techno-economic College), Esergazinov E. (Educational computing Department of

EKSTU), Cheskel N. V. (1C-Rating), A. K. Akiev (Nazarbayev Intellectual school). They gave an overall positive assessment of the level of training of students, trainees and graduates. Deputy Director on scientific work of the Regional specialized school-Lyceum for gifted children in mathematics, physics and Informatics praised the level of training of undergraduates OP "Mathematics", noting that 17 projects prepared by the students under the guidance of Anton Sherstobitov (graduate of 6M060100- "Mathematics") took 1st place in national and international competitions.

Graduates of the specialty "Mathematical and computer modeling" were represented by Saparbayev J. S., Usenov, S. B., Tezekbaeva S. T., Yakovleva O. V. and others (only 12 people). The graduates of 6M060100- "Mathematics" - by: A. Sherstobitov, Raisov B., Scherbakova J. A., Konyrhanova A. A. and others. The graduates noted that the knowledge and the competencies acquired during the study allowed them to solve difficult issues in their professional activities. Some of them combine teaching and research activities.

At the same time, employers and graduates recommended to improve the quality of language training; to raise the level of professional culture graduates, the AP of specialty "Mathematical and computer modeling" to include discipline-oriented knowledge of regulatory documentation in the field of office documentation, standardization and certification.

Interviewing teachers showed that they have a great knowledge of the content and structure of the AP, the questions of the expert Commission was answered informatively and convincingly. Teachers expressed satisfaction with the system of differentiated payment, the state of the logistics base as a whole; but at the same time noted the difficulties with the formation of professional motivation of students.

Quality assessment of educational programs was conducted based on the analysis of curriculum, catalog of elective courses, teaching materials, questionnaires of students and undergraduates, faculty, attendance, library, gymnasium, dormitories.

The management of an AP provides equal opportunities to students, including regardless of language of instruction on the formation of individual educational programs aimed at the formation of professional competencies. The promotion of students' and undergraduates' educational trajectories, their achievements are tracked in the existing monitoring system.

Control of the educational process and the performance of learners curriculum has a system of internal control (electronic journal, grading on the University portal in the "DALES", electronic statement of account monthly load of teachers). Organization of final control is carried out according to EKSTU DP 808-III-2013. For the procedure of appeal the control of knowledge of students shall involves the Appeals Committee composed of: the Chairman, Vice-Chairman, secretaries. The composition of the Appeals Committee and its Chairman is approved by the Rector's order (279-P dated 26.11.14).

The uniqueness of accredited educational programs is ensured by the implementation of the results of research work of creative teams of teachers and students in the learning process.

So the results of scientific research in the framework of the project "Development of information technology assimilation of environmental monitoring data in real-time" embedded in the learning process of the sub-department of Mathematical and Computer Modeling in 2013. The results of studies on the topic have been based on laboratory workshop with elements of scientific research in the discipline "Technology of numerical simulation". The results of research on innovative grant JSC "NATD" on the theme "Development of technology for multifunctional nanostructured protective coatings with high performance properties" implemented in the educational process of the sub-department of Mathematical and Computer Modeling in 2013. The results of studies on the topic were the basis of a course of lectures with elements of scientific research in the discipline "Numerical methods".

The uniqueness of 6M060100 – "Mathematics" AP of D. Serikbayev EKSTU is that it focuses on discipline "Theory of algebraic systems" and "Theory of constructive models" at the crossroads of algebra, mathematical logic and theory of algorithms. Results of research on the theme "Algorithmic

problems algorithmic systems and the analysis of complexity of algorithms", funded by the MES were implemented in the educational process of the sub-department "Higher mathematics" in 2014.

The AP 6M070500 "Mathematical and computer modeling" implements multilingual training.

The AP strong points are:

– the relevance and modernity of the content of academic disciplines, fundamental and according to new research areas in the teaching field;

– organization of monitoring of satisfaction of students, managers of company – locations and practices of employers;

– support for the introduction of research results into the educational process.

The weak points of the AP are:

– the level of verification and validation of the model of a graduate of an accredited AP;

– the AP structure does not fully reflect the activities, the content of which should contribute to the development of professional competence of students based on their personal characteristics;

– insufficient level of monitoring independent work of the student and appropriate mechanisms and tools adequate assessment of its results;

– the lack of joint educational programs with other universities.

Regarding the AP 5B070500 - "Mathematical and computer modeling", the Commission notes the following.

The content of this program is located at the intersection of the fields of mathematics, applied mathematics and information technology. According to the declared objectives and input requirements it is a serious and popular program containing the elements of elitism where graduates are in high demand (average 89% of graduates employment).

However, the existing ungraded groups caused the necessity of uniting students for studying disciplines of base and profile blocks in general flows with students of programs 5B070400 - "Computers and software" and 5B070300 - "Information systems".

This factor, combined with the specifics of professional qualifications and research interests of the faculty of the sub-department of mathematical and computer modeling, has led to significant transformation of the content of the programme in the direction of training in the operation of information systems that, in turn, led to the deformation of the model of the graduate and misalignment of the AP goals and intended learning outcomes.

So, for example,

– the goals of the AP are 80% in line with the goals of the master program 6M070500 - "Mathematical and computer modeling";

– imbalance between base and profile blocks of the academic disciplines of 5B070500 AP does not meet the requirements of training of graduates of the specialty "Mathematical and computer modeling", in mathematics and basic Sciences (some with experimentation);

– described on page 91 of the Report (Annex 8) the Model of a graduate of a general nature, the requirements for general education, professional competence, economic and organizational and managerial skills are not specific and not relevant to the AP "Mathematical and computer modeling";

– professional disciplines related to the design and administration of telecommunication and computer networks are a little bit away from the main channel of the program, their inclusion in the AP has insufficient justification. And, inversely, the presence of such disciplines as "Decision Theory", "Complex intelligent systems", suggest master rather than the undergraduate level;

– the profile of the partner companies where students have completed their internships, does not involve the acquisition of competencies stated in the learning outcomes of the AP.

The Commission recommends:

1. to bring the content of the AP 5V070500 into compliance with the requirements of the qualification characteristics of a graduate of the specialty "Mathematical and computer modeling". To this end:

- to revise the content of the programme with the aim of restoring the balance between blocks BD and PD of academic disciplines in mathematics and information technology;

- to align the objectives and learning outcomes in the model of a graduate of the OP.

2. To carry out a complex of works on a system basis for the harmonization of the content of educational programmes educational programmes leading Kazakhstani and foreign universities;

3. To strengthen the work on development of multilingual education both at the undergraduate and at the graduate level, including to create the conditions for a learner to choose the language learning of individual modules, regardless of the language of instruction, and to provide the possibility of increasing the number of dual educational programs.

4. Strengthen the role of teachers in the development and review of modular curricular, to complement the developed model graduates of accredited AP for two levels of education (BA-MA) based on national qualifications frameworks and the needs of key employers;

The EPC notes that according to the criteria of this standard the University has 8 strong positions, 21 - satisfactory, 4-criteria require improvement.

2) The teaching staff and the efficacy of teaching Standard

The presented data on the personnel potential of the specialties of this cluster characterizes the ability of the University to ensure the development of educational programs considered specialties.

The indicators based on quantitative and qualitative composition of faculty confirm the presence of human capacity needed to implement educational programs and the corresponding qualification requirements for licensing of educational activities.

The personnel policy is an integral element of the strategy of personnel management. The basis of the system of selection of teachers in hiring are "Rules of competitive replacement of posts of teaching staff and researchers of higher education institutions" dated February 17, 2012 No. 230 and Standard qualifying characteristics of posts of teachers and persons equated to them, approved by the order of the Minister of education and science of the Republic on 13 July 2009 No. 338 (with changes and additions from 09.06.2011).

The percentage of teachers providing educational program 5B070500 – "Mathematical and computer modeling" with academic degrees to 63%, and 6M070500 – "Mathematical and computer modeling" and 6M060100 – "Mathematics" – 100%. High scientific and pedagogical qualifications of the faculty who implement the AP is confirmed by successful participation in competitions of professional skill. So, the awardees of the state grant "Best University Teacher" are the head of the sub-department of MCM Rakhmetullina S. J., head of the sub-department of "Higher mathematics" Professor Khisamiev N. G., Professor Tynybekova S. D., Professor Khisamiev N. G. was awarded the breast mark of the MES "For merits in development of science of Kazakhstan", associate Professor Beloslyudova was awarded the badge "Honorary worker of education of the Republic of Kazakhstan". Associate Professor in the Department of MCM Baklanova O. E. is a Professor of the Russian Academy of Natural Sciences and a member of IEEE.

The University regularly monitors the activities of the faculty. The competence of teachers is checked comprehensive evaluation of teaching, research and community work on the rating system in the form of individual reports for each academic year.

The monitoring activity is carried out by:

- the functioning of the rating systems;

- a comprehensive evaluation of a teacher when participating in competitions for vacant positions;

- monitoring the implementation of individual plans in module "Rating of a teacher"";

- organization of peer-reviewed classes in accordance with the Regulation on credit technology of training in D. Serikbayev EKSTU;

- the system of surveys of students.

The University has developed a system of improvement of qualification, professional and personal development of faculty members. Positive practice is the extension of forms of training faculty (PC courses, internships, seminars, business trip in the near and far abroad). In order to develop skills in the use of innovations and information technologies in the educational process (teachers actively participate in scientific-methodical and educational seminars. For the last 2 years the vast majority of teachers passed courses of improvement of qualification, which is confirmed by appropriate certificates. Teachers of the sub-department Rakhmetullina S. J., Belginova S. A., S. S. Smailova took various courses in Lublin Polytechnic University (Poland). Associate Professor G. J. Soltan has internship by the international program "Bolashak" at the University of Leicester (UK). The instructors M. G. Emelyanova, Khasenova Z. T., Rakhmetullina S. J. have been trained in the framework of the Tempus programme in Greece, Bulgaria, Spain.

Preparation and improvement of professional skills is carried out through masters programs, short courses, seminars, internships in leading universities of Kazakhstan, CIS and foreign countries, this is reflected in Table 3.

Table 3 - Information on international exchange of EKSTU, business trips of teachers of the accredited AP "Mathematical and computer modeling".

№	Name	International Exchange	Dates
1.	Belginova Saule	Lublin technical University, Lublin, Poland	12 -17 november 2013
2.	Rakhmetullina Saule	Lublin technical University, Lublin, Poland	june, 2013.
3.	Blinaeva Elena	Kemer, Turkey	май, 2014
4.	Smailova Saule Sansyzbaevna	Kemer, Turkey	may, 2014
5.	Rakhmetullina Saule	TECNOCAMPUS Mataro, Spain	20-24 october, 2014
6.	Smailova Saule	Lublin technical University, Lublin, Poland	27-29 january, 2014
7.	Rakhmetullina Saule	University of information technology and library science, Sofia, Bulgaria.	24 - 28 february 2014г.
8.	Rakhmetullina Saule	Saratov state technical University, Saratov, Russia	27-29 january 2014
9.	Rakhmetullina Saule	St. Petersburg national research University of information technologies, mechanics and optics, Saint-Petersburg, Russia	march, 2015
10.	Soltan Gulzhan	The University of Leicester, Leicester, England	september, 2014 - august 2015
11.	Khasenov Zarina Toleubekovna	University of information technology and library science, Sofia, Bulgaria	26.-30.january 2015г.
12.	Emelyanova Maria Gennadievna	University Of Thessaloniki, Greece	26.-30.january 2015

Scientific research work of the academic staff is determined by the priority areas of research of the MES.

Table 4 – The topics of research carried out at the sub-department of "Higher mathematics" in the period of 2012-2014.

№	Title	Research advisor, performers	Financing, thousand tenge	The source of financing
2012–2013				
5	"Mathematical modeling and optimization of steam injection for heavy oil recovery"	Temirbekov N. M. Fikret Aliyev Amenova F. S.	4 000	MES RK
6	"Algorithmic problems of algebraic systems and the analysis of complexity of algorithms"	Khisamiev N. G. I. V. Latkin, Tulepbergenev R. K., M. K. Nurizinov	4 000	MES RK
7	"Generalized computability models and definability of models"	Khisamiev N. G.		Sub-department initiative theme 95–09–12
8	"Scientific and methodological foundations of professional and pedagogical orientation of mathematical preparation of students of technical colleges in the context of their competitiveness in terms of industrial–innovative economy of Kazakhstan"	Tynybekova S. D.		Sub-department initiative theme № 120–13
2013–2014 гг.				
9	Mathematical modeling and optimization of steam injection for heavy oil recovery	Temirbekov N. M. Aliev F.	4 000	MES RK
10	Algorithmic problems algebraic systems and the analysis of algorithm complexity	Khisamiev N. G.	4 000	MES RK
11	Development of new methods for approximate solutions of the Navier–Stokes equations in an arbitrary domain	Temirbekov N. M.	3 000	MES RK
12	Mathematical questions of difference schemes for equations of the atmospheric boundary layer	Temirbekov N. M.	5 000	MES RK
13	Generalized computability models and definability of models	Khisamiev N. G.	–	Sub-department initiative theme № 95–09–14
14	Scientifically–methodical bases of professional and pedagogical orientation of mathematical preparation of students of technical colleges in the context of their competitiveness in terms of industrial–innovative economy of Kazakhstan	Tynybekova S. D.	–	NCSTI Sub-department initiative theme № 174–14
15	Computability and algebraic structures	Khisamiev N. G., Badaev S. A.	–	MES RK (KazNU)

Teachers of the sub-department "Higher mathematics" are actively engaged in research activities, publish scientific articles in scientific journals and abroad with non-zero impact factor and journals recommended by the CCES MES and participate in international, scientific–practical conferences of different levels.

According to the results of the research work at the sub-department of "Higher mathematics" for the last 3 years in periodicals were published 168 articles and reports, including 11 in publications

abroad (USA, Austria, Bulgaria, Bosnia and Herzegovina, Turkey), 36 articles in journals recommended by the CCES MES, 73 abstracts of student work performed under the supervision of the sub-department. The sub-department for the last three years has more than 10 acts of implementation in the educational process of the research work of the sub-department in the form of textbooks, reading separate courses of lectures on the investigated topics.

Research work at the sub-department of Mathematical and computer modeling:

1) Development of information technology assimilation of environmental monitoring data in real-time (No. 594 (86-421-13)). Project Manager - candidate of Phys.-M. D., head of the sub-department Rakhmetullina S. J. members of the project - senior lecturers Belginova S. A. Khasenova Z. T

2) Development of methods and algorithms of image recognition to evaluate the quality of mineral rocks in the mining industry (No. 594 (81-421-13)). Project Manager - candidate of Phys.-M. D., associate Professor, Baklanova O. E. Project participants – PhD, senior lecturer Blinaeva E. V., senior lecturer Nursadykova R. K.

3) Development of program-technical complex process of cleaning dust and gas streams using infrasound exposure (No. 594 (82-421-13)). Project Manager - candidate of technical Sciences, senior lecturer Blinaeva E. V. project Participants – candidate of Phys.-M. D., associate Professor, Baklanova O. E., associate Professor, Smailova S. S., senior lecturer M. G. Emelyanova

4) Development of models and methods of analysis and recognition of video streaming for scalable high-loaded systems (No. 594 (83-420-13)). Co-Director of the project is candidate of Phys.-M. D., associate Professor, Baklanova O. E.

Over the past three years grant funding research on the accredited programs offered by the Department amounted to 46 million tenge.

Based on the results of research in the last 3 years in journals cited database of Thomson Reuteurs and Scopus the teachers of the AP published 12 scientific articles.

In 2012-2014 2 patents for software products were obtained:

1) Author's certificate No. 1127 dated 13 August 2013 to the software product "Localization of a source of air pollution according to measurements using a variational algorithm", author S. J. Rakhmetullina

2) Author's certificate No. 1476 dated 5 November 2013 to the software product "Automated information system "Database of educational statistics of the Republic of Kazakhstan", the authors Rakhmetullina S. J., S. S. Smailova

In 2012-2014 to implement the accredited programs the sub-department of mathematical and computer modeling involved foreign scientists from the leading scientific and educational centers, Table 5.

Table 5 - Visiting professors of the Sub-Department of Mathematical and computer modeling

Name	Degree, Title	University
Penenko Vladimir Viktorovich	Doctor of Sciences, Professor	Novosibirsk, Institute of computational mathematics and mathematical Geophysics SB RAS
Penenko Alexey Vladimirovich	Kandidat of Sc., Dotsent	Novosibirsk, Institute of computational mathematics and mathematical Geophysics SB RAS
Khakimzhanov Gayaz Salimovich	Doctor of Sciences, Professor	Novosibirsk, Institute of computational technologies SB RAS Novosibirsk state University
Topalov Nikolay Pavlovich	Doctor of Sciences, Professor	Barnaul, Polzunov Altai State technical University.
Kabanikhin, Sergey I.	Doctor of Sciences,	Novosibirsk, Institute of computational mathematics and mathematical Geophysics SB RAS

Name	Degree, Title	University
	Professor	
Isgandarov Jamil Abykaeva	Doctor of Sciences, Professor	Bishkek, Kyrgyz state University of construction, transport and architecture n. a. N. Isanova

Experts point out the unilateral mobility of the teaching staff.

The state of moral and psychological climate in the departments of accredited AP is characterized by stability, creative attitude to their duties.

Strong points of the AP are:

- compliance of personnel potential of the teachers to strategy and the specific educational programs;
- The it competence of faculty, the use of innovative methods and forms of education;

Weaknesses of the AP are:

- insufficient participation of practitioners in the implementation of the OP. Manual OP should demonstrate the logic of their involvement in the lessons.
- imperfect mechanisms to encourage professional and personal development of faculty and staff.

The Board recommends:

- to strengthen the participation of teachers in academic research, to ensure concerted action for the development of young teachers.

- to develop academic mobility, to carry out joint research in the implementation of the OP. To engage practitioners and to determine the proportion of read their disciplines.

The EPC notes that the 10 criteria of this standard the University has a strong position, 10 criteria - satisfactory position, and 1 criterion requires improvement.

4) Standard "Students"

Reception and admission to accredited AP is in accordance with the regulations of the Ministry of education and science of the Republic of Kazakhstan (MES RK). In 2012, this document was the Government's decree No. 111 dated 19.01.2012, "On approval of standard rules of reception on training in the organizations of education realizing professional training programs of higher education.

The master examination is performed in accordance with Government resolution №109 dated 19.01.2012, "Standard rules of reception on training in the organizations of education realizing professional training programs of postgraduate education". The admission is on a competitive basis by results of entrance examinations.

Information on enrolment is presented in Table 6.

Table 6 – Student enrollment in accredited AP

Academic year	Total number	Awardees of the state educational grant	On a payment basis	Instructed in the state language
5B070500 – «Mathematical and computer modeling»				
2012/2013	24	11	13	11
2013/2014	25	13	12	14
2014/2015	32	23	9	20
6M070500– «Mathematical and computer modeling»				
2012/2013	9	9	0	2

2013/2014	4	4	0	2
2014/2015	1	1	0	0
6M060100 – «Mathematics»				
2012/2013	4	4	0	4
2013/2014	4	4	0	3
2014/2015	2	2	0	2

Research work of students is an integral part of training in the University and is carried out through the organization of activities of the University, participation of students and graduates in research activities.

The research work of graduates 6M060100– "Mathematics" includes:

– graduates participate in the implementation of state budget-funded initiative of the Cathedral NCI (as executor under the grant MES 2012-2015 No. 0929/SFA on "Algorithmic problems of algebraic systems and the analysis of complexity of algorithms" hands. Khisamiev N. G., Spanish undergraduate: Konyrhanova A. A.);

– attracting graduates to develop research projects for submission to the contest Grant financing of MES of the Republic of Kazakhstan for 2015-2017 on "Computable representations of nilpotent and solvable groups and the complexity of algorithms." Khisamiev N. G., Spanish undergraduate: Konyrhanova A. A.), "Modernization of teaching methods of mathematical disciplines in a technical University in the context of the use of modern information technologies in scientific and educational processes." Tynybekova S. D., Spanish undergraduates: Konyrhanova A. A., Aitakova M. T., Kairbekova N. M. Ospanova N. M.);

– graduates participate in the quality initiative by Department theme "Scientific and methodological foundations of professional and pedagogical orientation of mathematical training of students of universities in industrial innovation economy of Kazakhstan."Tynybekova S. D., graduates: Konyrhanova A. A., Artemova GK).

– research work of graduates on topics related to decision research, innovation and production tasks (Scientific training of students according to the academic calendar (the mechanics and mathematics Department of Novosibirsk state University, November 2013, graduates participate in a period of stay on probation for the international conference "Mal'tsev read when IM SB RAS. S. L. Sobolev, on a scientific seminars of Professor A. S. Morozova, candidate.Phys.–Mat. Sciences A. V. Kravchenko, PhD. Phys.–Mat.Sciences V. N.Vlasova, PhD. SC.Sciences T. M. N. Kogabaeva, work in the dissertation reading room of the library of NSU and SB RAS.S.L.Sobolev on the topic of master's theses and the University of Siena (Italy) – November 2014), graduates participate in the work of the scientific seminar of the Department of mathematics);

Foreign scientific training (on-site) of the graduate students is carried out in accordance with the plan of the University and on the basis of international cooperation agreements. As the base of foreign universities in the AP 6M060100 – "Mathematics" are: Novosibirsk state University (Russia), University of Siena(Italy). Upon return from foreign trips undergraduates provide a detailed report on the results of the assignment in accordance with the approved plan trips, certified supervisor graduate student in the sub-department of postgraduate education, an extract from the minutes of the meeting of the scientific seminar of the sub-department approval of the report on overseas research internships (Protocol No. 2 dated 14.10.2014).

At the sub-department of Mathematical and computer modeling there is a circle of computer simulation "Optimist", where students from the first year are getting acquainted with the research area and are planning future scientific work, for example: "Development of methods and algorithms of image recognition to evaluate the quality of mineral rocks in the mining industry" (students: Curves V., Saparbekov G). Participation in competitions of scientific works, scientific-practical conferences confirmed by the corresponding diplomas, certificates, and copies of publications. In 2014 the graduates of AP 6M070500– "Mathematical and computer modeling" published 1 article in a scientific journal with an impact factor. The results of scientific research are presented at the annual

national and international conferences. For the last 3 years at national conferences attended 70% of the AP students of the sub-department of MCM.

The main focus of EKSTU with alumni is to promote their employment. Practical training and employment has been the Academic Department of the University. The University has created and operates an Association of graduates Altyn Besik" (http://www.ektu.kz/graduates/default.aspx). Established system of interaction with alumni EKSTU–EKTU– D. Serikbayev EKSTU of different years to obtain information about their employment. At a high level, implemented the recruitment process.

The data on the dynamics of employment of graduates of educational programs in the period from 2012 to 2014 are shown in the table.

Table 7 – Graduate placement

AP	2012		2013		2014	
	Number of graduates	Employment (%)	Number of graduates	Employment (%)	Number of graduates	Employment (%)
5B070500- Mathematical and computer modeling	4	100	10	90	9	78
6M070500- Mathematical and computer modeling	3	100	5	100	4	100
ОП 6M060100 – Mathematics	2	100	–	–	4	100

The graduates of 6M060100 – Mathematics after graduation are working in KazNPU named after Abay, "Nazarbayev intellectual school of chemical and biological direction" Ust–Kamenogorsk, Kazakhstan, RSE "D. Serikbayev East Kazakhstan state technical University", JSC "Kazakh leading Academy of architecture and construction, Almaty, Tsesnabank Astana, the entrepreneurship development Fund "Damu", and are trained at the doctoral program of D.Serikbayev EKSTU, Regional specialized school-Lyceum for odarennyh children in mathematics, physics and Informatics. The results of graduate employment of the AP for the last three years are presented in the table.

Table 8 – Positioning of the graduates in the labour market АП 6M060100 – «Mathematics»

Graduation year	Number of graduates	Of them employed	Employment (%)	Распределение на рынке труда, %		
				State Enterprise (%)	Educational institution (%)	Private companies (%)
2011/12	2	2	100%		50%	50%
2012/13	–	–	–	–	–	–
2013/14	4	4	100%	25%	75%	–

There are reviews about employment of graduates OP "Mathematical and computer modeling: Curves LLP V. "KDV Kazakhstan", Tezekbaeva sh "national testing center", etc.

One of the strengths of the University, the Board notes that a well-developed policy in the educational process and the availability of informational materials for students. As a source for rapid network electronic educational-methodical complexes of disciplines, lesson plans, information about progress of students actively use educational portal EKSTU (http://do.ektu.kz based on modern information and telecommunication technologies and providing a fundamentally new level of accessibility of education in maintaining its quality.

For students there is a "Guide book" with information about the learning process: basic concepts of credit technology of study, the rules of organization of educational process, the evaluation procedure of knowledge at the University, the order of registration to elective subjects, the order of transfer to the next year, the organization of the summer term, the elimination of academic debt, transfer to another school, recovery, deductions, provide academic leave, etc.

Feedback is via a blog of the rector (http://www.ektu.kz/blogs/rector/questionsList.aspx), where students have the opportunity to exchange and expression by handling questions and suggestions. Created portal student life http://www.do.ektu.kz/studentlifenew/StudLife/Default.aspx).

In the university there is formed a student government take a proactive stance in addressing issues of student life. The University established and operated student organizations such as the MTR and Zhasyl El, Press club – "Talent", of TV Studio – Arna, poetry club "Serpin", debate club "Erkin Soz", the club "Soleil". Through these organizations has been implemented to increase participation of students in the process of optimizing the high school as a social partner of the University administration and faculty, increasing the level of responsibility of young people for the quality of education and promoting the growth of organic solidarity in the social space of the University.

The University has developed a practice support communications with alumni, created the conditions for the functioning of alumni Association. Communication with graduates supported through negotiations, correspondence, meetings and email, as well as conducting surveys of graduates of the current year and previous years. Analysis of satisfaction of graduates with their employment is based on data from the survey of graduates of previous years.

Strong points of the OP are:

☐ attracting students to research;

☐ monitoring of employment and professional activity of graduates;

☐ created a mechanism for the monitoring of trainees ' satisfaction the activities of the ***University as a whole and individual services in particular.***

Weaknesses of the AP:

- lack of awareness of the AP students of the key roles (professional, social) based on learning outcomes;
- no double graduate education programs.

The Board recommends:

- to expand the possibilities to encourage students to educate themselves outside of the core curriculum;
- to diversify forms and methods of attracting employers to the process of employment of graduates.

EPC notes that on 9 criteria of this standard the University has a strong position, 5 - satisfactory position and 1 position improvement is needed.

Strong points of the AP are:

- attracting students to research;
- monitoring of employment and professional activity of graduates;
- created mechanism for the monitoring of trainees' satisfaction with the activities of the University as a whole and individual services in particular.

WEC notes that on 9 criteria of this standard the University has a strong position, 5 - satisfactory position and 1 position improvement is needed.

5) Resources Available for the Academic Programs" Standard

The accredited educational programs have a sufficient current level of modern logistics and information resources for the implementation of the University's mission, targeted to achieve the strategic goals and objectives, provide quality educational services and implement effective research activities.

During the work the Commission has verified the existence in the University learning environment that promotes the development of professional competency; adequacy of material and technical base for support of the educational process of the University. Classrooms and specialized laboratories meet the qualification, health and hygiene requirements and fire safety requirements.

Library fund of educational, methodical and scientific literature in General education, core courses and majors accrediting educational programs amounted for theAP Math: in 2012, 761, in 2013 - 802 copies, and in 2014 – 1064 instances, including in the official language (50%). For AP "Mathematical and computer modeling": in 2012 – 1995 , in 2013 – 2566 copies, and in 2014 – 3098 instances, including in the state language (45%). The Library, Academic Department, in conjunction with the departments undertaking work on monitoring of security of educational-methodical literature of the educational program. Currently work is being carried out on the basis of the information system "IRBIS", and the IP of the educational portal of the University at the conclusion of the various forms of reports.

Library organizes access to the resources of other libraries and organizations. Students have the opportunity to work with the scientific electronic editions ThomsonReuters, located on the platform WebofKnowledge, SciVerseScopus and SciVerseScienceDirect of the company Elsevier and SpringerLink, eLibrary, PMEB, KazNEB, POLPRED, references. Access to databases from any computer is provided by the university network.

Students and teachers have access to the database from any computer campus network. In the library there is a free internet Wi-Fi zone.

The students have access to full-text electronic library on the platform of the information system IRBISpo using the individual identification password for the library page. The Digital Library contains the full texts of 562 papers. Implementation DL system IRBIS meets international standards and does not prevent the infusion into the global information space. Digital Library is designed to provide each student the necessary teaching materials in on-line mode

Students have access to full-text electronic library on the platform of the information system IRBIS individual ID password on the library page of our website. Digital library currently contains the full text 562 documents.

In 2 computer classrooms there are available electronic textbooks of the university scientists, and other publications on electronic media (CD, DVD, audio and video tapes), which are widely used by students, undergraduates and faculty of the university in the educational process.

Electronic access to library resources is carried out by the university site pages http://www.lib.ektu.kz/.

Electronic access to library resources is through the pages of the University website, which presents: electronic catalogue of the library, electronic library of EKSTU. D. Serikbayev, virtual reference service, personal signs of works of scientists EKSTU. D. Serikbayev, bibliographies and lists of resources remote access acquired information resources, electronic application for magazines, new arrivals, a list of periodicals issued by the library, etc.

The University has the necessary social infrastructure. For nonresident students, the University has two student dormitories with a total area of 5949,7 sq. m. at 559 beds, occupancy of the dormitories is 100%.

The work on data provision makes it possible for widespread use in the educational process of modern information and communication technologies.

The park of computer hardware includes 1992 units, including computers – 1468, 33 effective servers, 16 of them are of dedicated configuration.

Today EKSTU has 20 computer, 28 multimedia and 2 specialized tutoring class, 15 classrooms for possible simultaneous testing of students during examinations period.

Constant access to the Internet can be used on-line-funds in the educational process. On student workstations installed applications for special purposes. Information terminals installed in all buildings with a touch screen for access of students to the educational portal.

Constant access to the Internet allows to use on-line-funds in the educational process. Applications for special purposes are installed on student workstations. Information terminals with a touch screen for access of students to the educational portal are installed in all buildings.

In order to create a unified information space of the university, as well as the transition to electronic interaction of all participants in the EKSTU. D.Serikbayev DOT educational process information and educational environment - educational portal of the university has been developed and operates (http://do.ektu.kz), it is based on modern information and telecommunication technologies and provids a new level of access to education, maintaining its quality.

Educational portal of the university allowed to create a unified educational and learning environment at the university and ensure its integration into the world educational space; it supports high-tech educational process; it allows to deploy a platform for e-learning.

Access to information - educational portal EKSTU is via the Internet, LAN and access terminals which are the university property.

EKSTU corporate network use network service functions: access to the Internet; access to electronic educational and scientific resources on the corporate network; own electronic boxes for internal use; the possibility of rapid communication in instant messaging; access for owners of e-mail accounts from any point of the world network; network "EKSTU radio"; network anti-virus system.

All workstations have access to the sites of EKSTU:www.ektu.kz; www.do.ektu.kz; student portal - www.std.ektu.kz.

There are areas of general and special free internet access.

Questioning about the computer classrooms and the Internet resources availability showed that 79,2%, are satisfied, 14,3% are partially satisfied , 3,9% are partially not satisfied, 2,6% are not satisfied. Questioning about the computer classrooms and the Internet resources availability showed that 85.7 % are satisfied, 13% are partially satisfied , 1.3% are partially not satisfied, 1.3% are not satisfied.

For training specialists the AP uses modern software products: "Deductor", Visual UML, Visual Studio, Matlab, Visual Prolog, etc.

Financing of the educational programs is based on the contingent of students and the cost of training one student for the program. Preparation of students is carried out at the expense of the state budget and on a paid basis.

In the University there is a mechanism of forward planning and development of laboratories.

Along with Technopark "Altai", the laboratory of engineering profile "RYTAS", business-incubator "BASTAU in the University operates 3 research Institute, 30 research laboratories and centers, technical equipment which is constantly updated.

For the purposes of accrediting educational programs in the presence of a common area owned by the operating management, specialized classrooms, offices, laboratories which comply with the sanitary norms and rules. Laboratory equipment correspond to the direction OP.

Public events are held in two halls equipped with sound and lighting equipment. All structural units of the University, deans, departments and laboratories of the University, the necessary computer hardware.

During the interview students, graduates, undergraduates and doctoral students revealed that the University has all conditions for development of young scientists and students; the programs of social support of students, including at the expense of University graduates.

Strong points of the AP are:

- accessibility for students to close to the maximum possible number of structured, organized information on readable disciplines, including personalized interactive resources and Wi-Fi;
- academic accessibility – students have access to personalized interactive resources available outside the classroom), as well as training materials and jobs, also provides the possibility of a trial of a self-assessment of students' knowledge through a remote access portal (site) of the University;
- professional orientation – students have access to personalized, interactive resources, assisting in the selection and achievement of career paths.

Weaknesses of the AP are:

- insufficient fund of educational, methodical and scientific literature in the context of language learning.

The Board recommends:

- *to achieve compliance of the infrastructure used in the implementation of educational programs, its specificity: classrooms, laboratories, communications equipment must comply with current international requirements;*
- *to continue work on the development of educational-methodical literature in elective subjects in the state language.*

WEC notes that on 21 criteria of this standard the University has a strong position on 11 - satisfactory position 0 position improvement is needed.

6) Standards in the context of individual specialties.

In accordance with the civil code of the Republic of Kazakhstan 08-2009 "Classifier of specialties of higher and postgraduate education of the Republic of Kazakhstan", approved by Order of the Committee for technical regulation and Metrology of the Ministry of industry and trade of the Republic of Kazakhstan dated March 20, 2009 No. 131-od with amendments and additions of 14 June 2011 No. 294-od specialty 5B070500/6M070500-Mathematical and computer modeling" refers to the group of "Technical Sciences and technologies", 6M060100 – "Mathematics" to the group of professions "Natural Sciences".

Natural and technical professions

The development of educational programs 5B070500 "Mathematical and computer modeling", 6M070500 "Mathematical and computer modeling", 6M060100 "Mathematics" is focused on producing graduates of high theoretical and practical training.

The modern state of preparation in AP supported the annual updates of the topics of projects and dissertations, as well as timely updating QED.

One of the priorities of the University is the development of interactive information and communication technologies (ICT). For classes, assignments on the CDS, including course projects, diploma works a specially equipped auditorium (business incubator "Bastau").

The training process uses the licensed software. The university continues the introduction in educational process of interactive equipment, including interactive whiteboards and modern software.

During the sessions, depending on the direction of training teachers introduced various innovative methods and technologies of training. Almost all lectures are conducted with the use of multimedia.

For independent work, individual preparation of students in the Institute are widely used electronic educational-methodical complexes, control of educational computer programs, individual assignments, and more. In addition, the disposal of the students of Institute of multimedia and

computer classrooms, which are equipped with learning and testing programs; laboratory, library electronic databases; halls of the library with an information retrieval system and the electronic document, which presents a multimedia encyclopedia, tutorials, dictionaries, translators, electronic, abstract journals, works of classics of science and literature.

To familiarize students with a professional environment and current issues in the field of specialization, as well as for the acquisition of skills based on theoretical training education program includes disciplines and activities aimed at gaining the practical experience and skills for careers in courses and majors in particular.

Practical training of students is carried out through professional practice, excursions to the enterprises during the training sessions and internships focused on deepening, systematization, generalization and concretization of theoretical knowledge acquired at the University, to improve professionally significant skills.

Every year for students of accredited specialties with a variety of events with the participation of representatives of enterprises. In the framework of these events, the teachers of the Department are guided tours on the enterprise database practices, for example: LLP Company system studies, "Factor", S. Amanzholov East Kazakhstan state University, etc.

There is also an annual graduate fair with the participation of representatives of enterprises and other employers. Employers talked about their businesses and prospects of development of modern technologies in manufacturing enterprises, students passing production practices, as well as future employment.

Educational programs specialties 5V070500 – "Mathematical and computer modeling", 6M070500 – "Mathematical and computer modeling", 6M060100 – "Mathematics" provide for the improvement of quality of preparation of specialists on the basis of the maximum approach of the educational process to the real production tasks:

- professional development of the teachers and staff of the departments via professional development programmes for teaching and educational support staff of the University;
- student participation in student competitions, student participation in round tables and other events;
- the development of cooperation with partners from other universities and employers in developing and improving the content of the OP (curricula and programs, the list and content of elective courses, methodological support, requirements to the level of knowledge, skills and professional competencies of graduates) subject innovative strategies for the development of mathematical and computer simulation methods in addressing issues of management of complex systems.

Weaknesses:

- insufficient practical skills of graduates in the specialty.

The Board recommends :

- *to strengthen the practical orientation of educational programs by increasing the number of excursions to the enterprises in the area of specialisation; increasing the share of practical training at enterprises; increasing the number of seminars on solving practical problems that are relevant to companies in the field of specialization; improve the quality of training in the field of foreign languages and it technologies.*

EPC notes that 0 criterion of this standard the University has a strong position, according to 3 criteria - satisfactory position and 0 positions require improvement.

RECOMMENDATIONS:

The EPC for the specialized accreditation of educational programs 5B070500 – "Mathematical and computer modeling" 6M070500 – "Mathematical and computer modeling", 6M060100 "Mathematics":

1. The content of the AP 5B070500 is not in full compliance with the requirements of the qualification characteristics of a graduate of the specialty "Mathematical and computer modeling". Recommended:

- to revise the content of the programme with the aim of restoring the balance between blocks BD and PD courses in the field of mathematics, applied and information technology;

- to align the objectives and learning outcomes in the model of a graduate of the AP.

2. To perform a risk assessment of the development of educational programs in accordance with the development Strategy of D. Serikbayev EKSTU and to develop a mechanism to reduce them.

3. To enhance cooperation and exchange of experience with domestic and foreign universities that implement such educational programs.

4. To strengthen the work on development of multilingual education both at the undergraduate and at the graduate level.

5. To develop academic mobility, to attract the best foreign and domestic teachers, to carry out joint research in the implementation of the AP. To engage practitioners and to determine the proportion of their disciplines.

RECOMMENDATION TO THE ACCREDITATION COUNCIL

The members of the External Peer Committee came to the unanimous conclusion that the educational program "6M070500 – Mathematical and computer modeling" and "6M060100 – Mathematics" of East Kazakhstan state technical University. D. Serikbayev can be accredited for 5 years, educational program 5B070500 – Mathematical and computer modeling" can be accredited for 3 years.

Chairman: _____ Pak Yuriy Nikolayevich

Commission members:

_____ Alexandr Grakovskiy
_____ Alexey Gostin
_____ Sheripidin Khamrayev
_____ Mikhail Smirnov
_____ Marzhan Yesenbayeva
_____ Yerzhan Karsybayev
_____ Abdulla Akhmedyanov
_____ Zhumakhan Mustafayev
_____ Viktoriya Kizeyeva
_____ Nazgul Zhakupova
_____ Aliya Sysykova
_____ Timur Kanapyanov