

PLAN
DEVELOPMENT OF THE EDUCATIONAL PROGRAM
"Power supply"
in the specialty "Electric Power Industry" for 2018-2020

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1 Passport

The plan for the development of educational programs "Electric Power Industry "
for 2018/2020

Reasons for developing a development plan for the

1	Reasons for developing a development plan for the OP	The basis for the development of a development plan for the OP " Electric Power Industry " is the improvement and effective implementation of educational programs of the specialty. The strategy and tactics of the EP development plan are developed in accordance with the educational policy of the Republic of Kazakhstan, the main goal of which is to train highly qualified personnel that meets the needs of the state and stakeholders.
2	The main developers of the OP development plan	Head of Department., Doctor of Technical Sciences, Tatkeeva GG, PPS of the Department "Power supply"
3	Terms of implementation of the development plan for the OP	2018-2020
4	Volume and sources of financing	-
5	Expected outcomes of the implementation of the development plan for the OP	The expected end results of the implementation of the development plan of the " Power supply" OP are: improving the quality of educational services to the international level; improving the efficiency of the educational process through the widespread introduction and application of innovative technologies in the educational process of the Department of " Power supply "; improving the effectiveness of scientific research, increasing the demand of specialists in this industry, which dictates the need for constant updating of programs, teaching materials.

2. Analytical substantiation of the program

2.1 Information about the educational program: The educational program of the specialty 5B071800 - "Power supply" was developed in accordance with the National and European Qualifications Framework, professional standards, and was coordinated with Dublin descriptors. Developed on the basis of the State Compulsory Standard of Higher Education, approved by

Decree of the Government of the Republic of Kazakhstan dated August 23, 2012 No. 1080, the Model Curriculum for the specialty 5B071800 - "Electric Power Engineering" The educational program is designed on the basis of a modular system for the study of disciplines and consists of 8 modules that form general educational and professional competencies. The educational program was created on the basis of a request from employers, in accordance with national development priorities and in connection with the adoption by the Government of the Republic of Kazakhstan of the state program "Energy Saving - 2020".

2.2 Information about students

At this time, 399 students are studying in the specialty of bachelor 5B071800 - "Electric Power Industry". The contingent of students of the specialty 5B071800 - " Electric Power Industry " in the context of courses and the contingent of students of the specialty 6M071800 - " Electric Power Industry " without taking into account the set for the 2018/2019 study year are presented in Table 1 and 2 respectively.

Table 1 - The contingent of students in the specialty 5B071800 - " Electric Power Industry "

	1 course	2 course	3 course	4 course
In the state language	109	91	86	30
In Russian	43	44	47	23
Total	152	135	133	53

Table 2 - The contingent of students in the specialty 6M071800 - " Electric Power Industry "

	1 course	2 course
Scientific and pedagogical direction	20	7
Profile direction	19	21
Total	39	28

2.3 Internal conditions for the development of OP

In connection with the reduction of classroom hours for the effective implementation of the credit technology of education, the use of innovative teaching methods is of particular importance. Technological support of students of the studied educational programs is carried out as follows: interactive teaching methods are actively used when carrying out laboratory work based on virtual and software-hardware laboratory-practical complexes. Innovative teaching methods using interactive boards, virtual laboratories, digital educational resources are constantly being introduced in the EP "Electric Power Supply". Teachers of the

department in the classroom widely apply a variety of traditional, innovative technologies, such as brainstorming, sinwain, cluster, RAFT technology, Smart Education, problem-oriented learning or PBL.

2.4 Characteristics of the surrounding society. At the department for students of the educational program is determined by the base of practice, agreements and agreements with enterprises for the passage of educational, industrial and pre-diploma practice. Currently, the specialty " Electric Power Industry " there are contracts with 15 industrial enterprises. Every year representatives from productions are invited to give lectures. In order to develop academic mobility and double-diploma education, partners are being sought among foreign countries, countries of the Customs Union and the CIS.

In order to provide high-quality training for specialists at the Department of " Electrical Supply" work is underway to expand international cooperation, which is carried out in two main areas - training for teachers and graduates and the organization of research and experimental and scientific-pedagogical practices in foreign universities. The department has cooperation agreements with organizations from Belarus, Bulgaria, Slovenia, Lithuania, Poland, and Russia. Today the department successfully cooperates with the Belarusian State Technological University, Siberian State University and Tomsk Polytechnic University.

2.5 Information about teaching staff implementing the educational program

The faculty is the main resource for securing the mission of the university. In this regard, great attention is paid to the selection and training of personnel. The staff of the specialty "Electric power industry" is staffed in accordance with the legislation of the Republic of Kazakhstan and the Rules of competitive replacement of posts of scientific and pedagogical staff of higher educational institutions. The staff of the faculty of the department is 25 employees, of which 4 are doctors of technical sciences, 11 are candidates of technical sciences and 6 are masters. The qualification of the faculty of the department is fundamental to the quality of the educational services provided and is ensured by the systematic assessment of the competence of teachers by the university administration. To better ensure the educational process, the department invites to work the graduated teachers, graduate students and doctoral students. EP in relation to the faculty requires compliance with basic education, teaching experience, competence in the taught discipline. The faculty of the department meets the qualification requirements of licensing educational activities and has a full knowledge of modern teaching methods, which allows you to organize an effective learning process. In accordance with the Law of the Republic of Kazakhstan "On Education", all teachers, at least once every 5 years, undergo advanced training at the republican and international levels and have certificates. Advanced training of teaching staff takes place according to the main activities of the department, which are conducting research and teaching disciplines in the field

of electric power. Practicing teachers, using their practical work experience, introduce them into the educational process in the form of business games, situational tasks, thereby improving the mastery of the program of disciplines, and developing the professional skills of the future specialist.

2.6 Characteristics of the achievements of the OP

KATU named. S.Seifullin participates in ratings, such as the national rating of demand for universities of the Republic of Kazakhstan, where the quality of educational programs is assessed by levels and areas of training (NAAR) and the rating of the Republican rating agency Kazakhstan 2050 - National Rating for Innovation and Academic Excellence. So, among universities - participants of the rating of the NAAR in educational programs of the undergraduate 5B071800 - " electric power industry " in

2017 took the II place, and the magistracy 6M071800 - " electric power industry " - I place, 2018, III and II, respectively. The success of the educational program implementation is determined by the planned, purposeful and effective implementation of the goals and development plan of the above-mentioned cluster developed with the involvement of all stakeholders of the program, taking into account the analysis of student satisfaction and teaching staff / staff, the analysis of available and necessary resources for the program, including the material and technical base .

3. Characteristics of the problems addressed by the EP development plan, and justification of the need to solve them: The educational program is aimed at training personnel for the professional activities of graduates of the specialty “Electric power industry” in the field of determining the optimal production and technological modes of operation of electric power facilities, developing promising power projects plants for various purposes, the implementation of technological calculations for the preparation and commissioning of rooborudovaniya, select the modes of operation and regulation of technological processes, mode control operation of power equipment enterprises, the implementation of the verification of measuring instruments of diagnosis and drawing up plans of repair technological equipment of high voltage electric power enterprises, diagnosis, service and maintenance of power equipment.

4. The main goals and objectives of the development plan of the EP with the terms and stages of its implementation: The educational program of the specialty 5B071800 - “electric power industry” was created on the basis of a request from employers, in accordance with national development priorities and in connection with the adoption by the Government of the Republic of Kazakhstan of the State Program “Energy Saving”. - 2020 " .

The expected end results of the educational program imply a clear orientation towards the future, which is manifested in the possibility of constructing one's education in view of the success in personal and professional activities meeting the requirements of employers.

5. Measures to reduce the impact of risks for the OP:

For educational activities, as well as for any other, specific risks peculiar only to it are characteristic. This should be taken into account when developing measures to manage these risks. Consequently, risk management methods must be adjusted in accordance with the tasks set for them. There is a need to develop a model that would allow to effectively manage emerging risks in educational institutions, taking into account the specific features of educational activities. Speaking about the specific features

№	Tasks	Terms of development	Stages of development
1	Providing conditions for obtaining a full-fledged, high-quality professional education	The whole period of study	Provision of educational services for the development of professional skills
2	Formation of core professional competencies in future bachelors in the specialty " electric power industry "	The whole period of study	Acquisition of professional competencies
3	Ability to work with scientific and technical literature, use domestic and foreign experience in professional activities, systematize and summarize the information received.	The whole period of study	Analysis and processing of the results
4	Consultations of employers and scientists of scientific research institutes at a choice of actual and practically significant themes of theses and master's theses	The end of undergraduate education and the beginning of graduate studies	Consultation of employers and stakeholders

of educational activities, it is necessary to distinguish the intangibility of educational services, which is manifested in the impossibility of assessing their quality and volume until full acquisition, that is, until the graduate receives a certain specialty, defending graduation qualification work. Another distinctive feature of educational services is the impossibility of their direct monetary measurement. The price mechanism is often unable to objectively assess the cost of educational services, which is

associated with the difficulty of reflecting all the costs of the implementation of educational activities. There are other features of educational activities. Each of them has certain categories of risks, which, in turn, are analyzed and managed by different methods.

Risks of educational activities:

- 1 Insufficient number of applicants;
- 2 Insufficient provision of the level of quality of educational services;
- 3 Inadequacy of educational and methodological support to modern requirements;
- 4 Insufficient financing of educational activities;
- 5 Lack of qualified teaching staff;
- 6 Insufficient information support of the educational process;
- 7 Changes in the market for educational services;
- 8 Increase the cost of educational services;
- 9 Making the wrong strategic decisions;
- 10 Incorrect allocation of budget funds;
- 11 Losses associated with incompetence of teaching staff

Risk analysis is focused on promoting risk understanding. It provides data for risk assessment and decision making regarding the need to consider risks and the most appropriate strategies and methods of consideration. At the end of the school year, process managers provide a risk management report to the quality service. After submitting reports, SC conducts risk management analysis once a year. Until November 1 of this year, heads of departments are developing a risk management plan. In July, over the past academic year, each process manager provides a report according to the risk management plan. The risk map, the risk management plan are reviewed and approved by the Management Board of KATU. Named S.Seifullin "in December of the current year.

The approved risk management plan and risk map are submitted to the Board of Directors for consideration by the First Deputy Chairman of the Management Board.

Risk monitoring is about controlling the level of risk. This is achieved by updating on a regular basis (once a year) information about risks, risk management measures, the status of implementation of measures, as well as tracking the degree of influence and probability of occurrence of risks developed earlier at the stage of identification and risk assessment.

6. Plan of activities for the development of OP

№	Name of events	Terms of implementation	Responsible	Expected results	Resource provision
1	Formation of a commission for the development of an educational program	2018-2020 June	Tatkeeva GG, PPP	Faculty Development Board	Staff, library resources
2	Development of goals and objectives of the educational program	2018-2020 June	Tatkeeva GG, PPP	Aims and objectives of the educational program	Personnel, library, electronic resources
3	Determination of the competence of the specialist list and specialty disciplines	2018-2020 June	Tatkeeva GG, PPP	Competences of a specialist and specialty disciplines	Personnel, library, electronic resources
3.1	Development of a common position on the competencies of the educational program of specialists with employers	2018-2020 June	Tatkeeva GG, PPP	Positions on competencies OP of professional specialists with employers	Personnel, library, electronic resources
3.2	Development of a common position on the competencies of the educational program of disciplines of the specialty with employers	2018-2020 June	Tatkeeva GG, PPP	Positions on competencies of the OP disciplines specialty with employers	Personnel, library, electronic resources
3.3	Formation and coordination of specialist competencies and specialty disciplines with Dublin descriptors	2018-2020 June	Tatkeeva GG, PPP	Competences of specialist and disciplines with Dublin descriptors	Personnel, library, electronic resources
4	Formation of the educational program in accordance with professional standards	2018-2020 June	Tatkeeva GG, PPP	OP in accordance with professional standards	Personnel, library, electronic resources

5	Drawing up an academic calendar and working curriculum for the specialty in accordance with the developed educational program	2018-2020 June	Tatkeeva GG, PPP	Academic calendar and working curriculum in the specialty in accordance with the developed Op	Personnel, library, electronicresources
6	Consideration of the educational program at an expanded meeting of the department with the participation of employers	2018-2020 Aug. Sept	Department "Electro supply, employers	Minutes of the examination of the OP at an extended meeting of the department with the participation of employers	Personnel, library, electronicresources
7	Consideration and approval of the educational program at the faculty academic council	2018-2020 September	The members of the Council of the Faculty of Energy, employers	The protocol of consideration of the educational program at the academic council of the faculty	Personnel, library, electronicresources

7. Mechanism for the implementation of the development plan of the OP: The development plan and objectives of the OP are developed in accordance with national development priorities. One of the seven long-term priorities of the Development Strategy of the Republic of Kazakhstan until 2030 is energy resources.

The development plan of OP contributes to the development of personal qualities for bachelors, as well as the formation of general cultural universal (general scientific, social and personal, instrumental) and professional competences in accordance with the requirements of the standard in the direction of training " electric power industry ", the formation of professional competencies.

In drawing up an OP development plan, security was taken into account with all the necessary resources for the implementation of this OP. To inform all interested parties, the University's website www.kazatu.kz hosts an approved OP development plan, draft discipline work plans, academic calendars and lists of elective disciplines. The library has catalogs of elective disciplines.

In terms of the development of educational programs of the specialty " electric power industry " the following were taken into account:

- Compliance with the period of training, graduate qualifications, the complexity of training, structure, terminological apparatus and a number of other provisions, the main educational program;
- the continuity of the scientific foundations of the educational process, laid down in the educational program, the traditional foundations of the education system, in particular, the principle of unity of education, upbringing and education, an integrated approach to the organization of the educational process and the theory of phased knowledge generation, skills and abilities of students;
- pedagogical traditions of the university, aimed at training high-quality cadres of a wide profile, taking into account the specifics of the functioning of the country's economy in modern social conditions;
- representation of the system of higher professional education as a step in the system of continuing professional education, the totality of educational institutions of which provides training for professional personnel;
- competence-oriented orientation of the whole pedagogical system and each of its elements, considering competence as a system of knowledge, skills, abilities, work experience and personal professionally oriented qualities of a graduate.

8. Evaluation of the socio-economic effectiveness of the implementation of the development plan for the OP:

At the end of the school year, at the meeting of the department with the participation of all stakeholders (PPP, employers), a self-assessment of the EP is carried out, taking into account the changes made, the results achieved, the effectiveness and efficiency of the OP implementation are discussed.

- The demand for the specialty and its prospects gives rise to a significant interest of applicants to this direction: the annual UNT passing score for the specialty 5B071800 - " electric power industry " is 88-94 points, and 150 students for example enter the 2018/2019 academic year.

- The goal of the OP meets the needs of the state, employers of individuals and students. The state's needs are determined by an annual state order, which is 300–500 people, and by state order, at least 25–35 people annually arrive at the Saken Seifullin Kazakh Agrotechnical University, which is 10 percent or more of the entire state order in the Republic. In Kazakhstan, more than 20 universities are trained in this specialty.

- KATU them. S.Seifullin cooperates with 26 international organizations and programs from 9 countries: TEMPUS, ERASMUS MUNDUS, FAO, (European Union), TIKa, Mevlana Exchange Program (Turkey), MASHAV, (Israel) IAMO,

LOGO eV, Konrad Adenauer Stiftung, DEULA, DAAD, APOLLO, John Deere, CLAAS, Wiehenstephan -Triesdorf (Germany), AF (French Alliance), ESA (France), Qualita Studio, FederBio, (Italy), Cochran Fellowship Program, USDA, USAID, Borlaug Fellow-ship Program, FULBRIGHT, (USA), JICA (Japan), Chinese Machinery Institute (PRC).

- The University has signed over 200 contracts and memorandums of cooperation with universities and research centers from 35 countries of the world. A full list of treaties and memorandums of S. Seifullin KATU with foreign universities is presented on the university website in the international cooperation section, the main areas for the development of international cooperation are also presented (<http://kazatu.kz/ru/ob-universitete/centr-razvitiya-mejdunarodnogo-sotrudnichestva-i-poliyazichnogo-obrazovaniya/mejdunarodnoe-sotrudnichestvo>). This information is useful for students and undergraduates studying in the specialty " electric power industry " when planning internships or implementing an external academic mobility program.

- In the laboratories of the department "Power supply" there is a modern equipment. Educational program-methodical complex (based on a laboratory complex) "Model of an electrical system with a complex load node", intended for carrying out laboratory work in the following disciplines: "Electric power industry", "Relay protection and automation of electric power systems", "High voltage engineering", "Electrical stations and substations ", " Power supply ", " Electric networks ". There are vacuum breakers manufactured by Tavrida Electric, overvoltage suppressors for 110 kV and 35 kV. Educational laboratory complex "Theoretical Foundations of Electrical Engineering", "Electrical Engineering and Fundamentals of Electronics" (computerized version).

It is planned to purchase laboratory equipment in the amount of 10 000 000 (ten million) tenge.

Highly qualified scientific personnel are being trained through the magistracy at the level of modern requirements. In 2018, a license was received for PhD training and the first admission to doctoral studies will be in 2019.

9. Model of the graduate of OP on the levels of training

The model of the graduate of the educational program “Power supply” for two levels of education (BA-MA) is supplemented with consideration of the national qualification framework and the needs of key employers. The model of the graduate was developed by a working group based on the GOSO specialty and discussed with employers and at the meeting of the department.

The bachelor in the specialty 5B071800 - “ Electric power industry ” is preparing for the following main types of professional activity: production and technology; design and technological; organizational and managerial.

At the same time, the professional-practical activity of a bachelor's graduate is primarily related to the introduction and operation of modern electric power equipment, new systems for technical diagnostics of elements of the electric power complex, technical measures and preparation of projects aimed at improving reliability and reducing accident rates in the electric power industry. The bachelor in the specialty 5B071800 - " Electric power industry " should be able to solve the following professional tasks.

Production and technological activities:

- analysis and adaptation of high voltage electrical equipment of foreign manufacturers for work in domestic and foreign energy systems;

- determination of the optimal production and technological modes of operation of power generation facilities;

In the implementation of design and technological activities:

- collection and analysis of source data for the design and modernization of technological processes;

- design of technological processes of generation and transmission of electricity;

- Metrological examination of design documentation, development of a control system and selection of measuring instruments;

- carrying out feasibility studies of design and technological solutions.

In the implementation of organizational and management activities:

- organization of work of small groups of performers involved in the development of products, technological processes and their implementation;

- performance of work on standardization, technical preparation for certification of technical means, systems, processes, equipment and materials;

- preparation of documentation for the creation of a quality management system in the enterprise;

- carrying out organizational and planning calculations for the creation or reorganization of production sites;

- control over the observance of production and labor discipline, life safety requirements;

- participation in measures to ensure energy supply in international energy systems, designed and operated facilities;

- implementation of measures for the environmental safety of the enterprise.

In the implementation of service and operational activities:

- manage the operating modes of the equipment of electric power enterprises;

- the implementation of calibration measurement tools;

- implementation of diagnostics and drawing up plans for the repair of process equipment, high voltage of electric power enterprises;

- diagnostics, maintenance and repair of electric power equipment.

The Master in the specialty 6M071800 - “ Electric power industry ” is preparing for the following main types of professional activity: industrial and technological; design and technological; organizational and managerial.

Additional professional activities are: research; service and operational.

The master in the specialty 6M071800 - “ Electric power industry ” should be able to solve the following professional tasks.

Production and technological activities:

- development of promising projects for electric power plants for various purposes;
- analysis and adaptation of high voltage electrical equipment of foreign manufacturers for work in domestic and foreign energy systems;

- development of new technological processes and equipment;
- determination of the optimal production and technological modes of operation of power generation facilities;
- examination of the proposed design solutions and new technological solutions;
- analysis and synthesis of measurement results and research, participation in working groups for the preparation and implementation of practical solutions in the field of activity.

In the implementation of design and technological activities:

- design of technological processes of generation and transmission of electricity;
- performance of technological calculations for the preparation and adjustment of equipment, the choice of operating modes and rationing of technological processes;
- analysis of the existing and development of new design process documentation;
- carrying out feasibility studies of design and technological solutions.

In the implementation of organizational and management activities:

- drawing up organizational and technical documentation (schedules, instructions, estimates, plans, applications for materials and equipment) and preparing reports on the established forms;

- analysis and evaluation of production and non-production costs to ensure the required product quality, analysis of the performance of production units;
- development of operational work plans of primary production units;
- preparation of documentation for the creation of a quality management system in the enterprise;
- carrying out organizational and planning calculations for the creation or reorganization of production sites;
- control over the observance of production and labor discipline, life safety requirements;
- participation in measures to ensure energy supply in international energy systems, designed and operated facilities;
- implementation of measures for the environmental safety of the enterprise.

In the implementation of research activities:

- collection and study of scientific and technical information, domestic and foreign experience in the field of production, transmission and distribution of electricity, operation of electric power equipment;
- Mathematical modeling of processes and equipment using standard packages and computer-aided design tools and research;
- carrying out experiments according to specified methods, processing and analysis of results;
- carrying out technical measurements, drawing up descriptions of the research;
- preparation of data for the preparation of scientific reviews and publications;
- participation in the preparation of scientific reports on the assignment and in the implementation of the results of research and development in the field of electric power industry.

In the implementation of service and operational activities:

- manage the operating modes of the equipment of electric power enterprises;
- the implementation of calibration measurement tools;
- implementation of diagnostics and drawing up plans for the repair of process equipment, high voltage of electric power enterprises;
- carrying out diagnostics, maintenance and maintenance of electrical power equipment.

Head of the Department of "Power supply"

G.G. Tatkeeva