

Ministry of Science and Higher Education of the Republic of Kazakhstan
Korkyt Ata Kyzylorda University

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GRADUATE MODEL
According to the Master's degree program
7M07155 Electric Power Industry (Renewable energy)

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Content

Introduction

1. Description of the OP

2. The constituent components in the formation of the graduate model of the educational program

2.1. Objectives of the educational program

2.2. Objectives of the educational program

2.3. General and specialized competencies

2.4. A matrix for comparing the learning outcomes of an educational program with the competencies being formed

2.5. Personal qualities of a specialist

Conclusions

Introduction

The model of competencies for the implementation of the Main directions of the Bologna process is designed to answer the question of what professional tasks a specialist of a certain degree (position), a certain profile should solve. The formation of a modern graduate model that meets the needs of stakeholders and all interested parties is the main strategic goal of the Korkyt Ata NGO and is provided with human, educational, methodological, informational and logistical resources necessary for the educational process. The university carries out a targeted personnel policy and systematic improvement of the material and technical base of the university to ensure high-quality training of graduates of masters in demand in the labor market.

1. Description of the educational program

Master of Technical Sciences in the educational program 7M07155-Electric Power Engineering (Renewable energy). The field of professional activity, which includes the field of science and technology, including a set of technologies, means, methods and methods of human activity aimed at creating conditions for the production, transmission, distribution and consumption of electric energy. As well as organizations of higher and postgraduate education, research and design organizations.

2. The constituent components in the formation of the graduate model of the educational program

The main components of forming a graduate model of an educational program include information about the goals and objectives, objects of the educational program, types and directions of professional activity, models of specialist competencies, including descriptors, type of competencies in accordance with the educational program and the results of the educational program.

2.1 Objectives of the educational program

Development of tasks and programs of scientific research on problematic issues of the electric power industry, development of methods of theoretical and experimental research, conducting theoretical and experimental research, processing, analysis and generalization of research results, use of computer programs for modeling static and dynamic processes, training of specialists with modern knowledge on the design and competent presentation of scientific and design products;-training of specialists with the ability to manage teams and lead research work.

2.2 Responsibilities of the educational program:

- training of qualified personnel corresponding to the tasks of the innovative economy of the country;
- creating conditions for the development of science and innovation, attracting young people to the formation of new ideas;
- increasing the contribution to the development of national unity, national culture and a harmonious personality

2.3. General and specialized competencies

ЖК1/OK1 / GC1 Philosophy summarizes the results of the practical and spiritual development of the world, the socio-cultural development of public life, possible strategies and ways to identify and find cultural identity.

ЖК2/OK2/GC2 The undergraduate will have spelling, lexical and grammatical competence.

ЖК3/OK3/GC3 Knowledge about the role of the education system, purpose, content, methods, principles of education, didactics of the school, forms of education, credit technology system, features of educational work in the school, the basics of the teacher's culture, get acquainted with information at various stages of development of the child, analyze its pedagogical features; acquire skills of mastering the requirements for the student's personality.

ЖК4/OK4/GC4 It forms the basis of psychological knowledge about the development of personality, knowledge of the laws and mechanisms of development of the human psyche, develop skills in analyzing the psychological characteristics of social communication.

КК1/ПК1/PC1 Mastering by masters of theoretical foundations and practical skills in data processing and modeling of an experiment using modern capabilities of computer application programs. Planning and processing data of multifactorial experiments and compiling scientific reports and dissertations, writing articles in scientific journals.

КК2/ПК2/PC2 Theoretical and practical training of master's students in the field of scientific research and inventive creativity. Methods for solving scientific problems, methodology of theoretical and experimental research; Processing of measurement results and error assessment; Formulation of the conclusions of the scientific study; Preparation of a report, report or article based on the results of a scientific study; Preparation of applications for the proposed inventions; Conclusion of empirical dependencies based on experimental data; Planning and management of research activities.

КК3/ПК3/PC3 Principles, methods and technical means of rational use of electricity and reduction of energy losses in the power supply system of an industrial enterprise. providing consumers with electric energy with rated quality, reliability and economy. Basic mathematical methods for calculation of reliability of power supply systems. Reliability analysis of individual power supply systems. Main ways of SES operational reliability improvement.

КК4/ПК4/PC4 Introduces the main indicators of the quality of electric energy, reliability and efficiency, and the main ways to save energy.

КК5/ПК5/PC5 To form undergraduates' knowledge about indicators that characterize the quality of electric energy and their rationing, the impact of electricity quality on the operation of electric receivers, and the main methods and technical means of ensuring the quality of electricity.

КК6/ПК6/PC6 Formation of undergraduates' knowledge in the field of development prospects and existing world and domestic experience in the development of energy sources that are alternative to traditional ones.

КК7/ПК7/PC7 Development of a methodology for rational combination of traditional and renewable energy resources in the energy supply system for agricultural consumers to reduce the cost of energy consumed.

КК8/ПК8/PC8 Obtaining the necessary knowledge for undergraduates to determine the rigid relationships between the characteristics of electricity consumption and the operating mode of power supply systems, to prepare a highly qualified specialist capable of performing the entire list of tasks related to providing consumers with electricity with standardized quality, reliability and efficiency.

КК9/ПК9/PC9 Obtaining knowledge in the field of analysis of operating modes of consumers and generators of electric energy, the ability to use this knowledge in specific situations when managing

power plants, determining their operating conditions during design, research and training, the ability to analyze mode parameters when solving one of the tasks of planning the operation mode of a plant based on renewable energy sources (RES).

KK10/ΠK10/PC10 Formation of the ability to carry out pedagogical activities in universities, design the educational process and conduct certain types of training using innovative educational technologies.

KK11/ΠK11/PC11 Identify various types of damage and abnormal modes in the electric power system, be able to calculate it and develop relay protection and automation devices for them.

KK11/ΠK11/PC11 In the course of studying this discipline, the master's student expands and deepens parts of the following competencies the ability to take part in the design of professional activity objects in accordance with the technical task and regulatory and technical documentation, observing various technical, energy-efficient and environmental requirements, and the ability to justify design decisions.

KK12/ΠK12/PC12 The purpose of creating the discipline "Design and operation of solar and wind power plants" is to develop competencies in the field of understanding the regime of electric power facilities and their use in the management, operation, and design of installations based on renewable energy sources.

KK13/ΠK13/PC13 The purpose of the discipline is to provide undergraduates with theoretical foundations and practical skills for processing experimental data using modern PC capabilities.

KK14/ΠK14/PC14 The competence of the student, formed as a result of mastering the discipline: the ability to formulate their thoughts, possess the skills of public speech, argumentation, discussion and polemics, presentation, to convey information to specialists and non-specialists, problems and ways to solve them; the ability to search, store, process and analyze information from various sources and databases, present it in the required format using information, computer and network technologies.

KK15/ΠK15/PC15 Study of construction and technological features of renewable energy plants. Basis of design of design, process and design documentation for construction, installation and adjustment of power plants. Methods of calculation of power facilities, auxiliary equipment and process diagrams. The technological features and composition of the equipment of wind power plants, small hydroelectric power plants, solar collectors, solar photovoltaic stations, heat pumps, geothermal thermal stations are studied. The current state and problems of energy efficiency and energy saving. Regulatory solutions for the development of renewable energy in the countries of the world, features of the design of the main types of power plants of unconventional and renewable energy.

KK16/ΠK16/PC16 Acquiring experience in the study of an actual scientific problem, expanding professional knowledge gained during training, and developing practical skills in conducting independent scientific work. The practice is aimed at developing the skills of research, analysis and application of economic knowledge.

2.3. A matrix for comparing the learning outcomes of an educational program with the competencies being formed

Competence	ΟЖН1/ΠΠΟ1/ΠΛΟ1	ΟЖН2/ΠΠΟ2/ΠΛΟ2	ΟЖН3/ΠΠΟ3/ΠΛΟ3
ЖК1/OK1/GC1	+		
ЖК2/OK2/GC2	+		

ЖК3/ОК3/ГС3	+		
ЖК4/ОК4/ГС4	+		
КК1 /ПК1/РС 1		+	+
КК2 /ПК2 /РС 2		+	+
КК 3/ПК3/РС3		+	+
КК 4 /ПК4 /РС4		+	+
КК5 /ПК5/РС 5		+	+
КК6 /ПК6 /РС 6		+	+
КК 7/ПК7/РС7		+	+
КК 8 /ПК8 /РС8		+	+
КК 9/ПК 9/РС9		+	+
КК 10/ПК10 /РС10		+	+
КК 11/ПК11/РС11		+	+
КК 12/ПК12 /РС 12		+	+
КК 13/ПК 13 /РС13		+	+
КК 14 /ПК 14 /РС 14		+	+

2.5. Personal qualities of a specialist in the Electric Power (Renewable Energy) educational program

After graduation, specialists calculate and analyze the operating modes of electric power facilities; determine effective modes, equipment composition and its parameters in accordance with the scheme of objects; carry out operational changes in circuits, modes of operation of electrical installations; develop and maintain operational documentation provided for by the rules of operation of equipment and organization.

After graduation, specialists can find jobs at power generating plants, design companies in the field of energy in educational and scientific institutions, research laboratories, large industrial enterprises, factories (performs the functions of an electrical engineer).

Head of the educational program



G.K.Sydykova