

**Profile of the educational program**  
**«Electrical Systems and Complexes of Vehicles»**  
**in specialty 141 Electrical Energetics, Electrical Engineering and**  
**Electromechanics**

<b>1 - General information</b>	
<b>Full name of the institution of higher education</b>	O.M. Beketov National University of Urban Economy in Kharkiv
<b>Grade of higher education and title of qualification in original language</b>	Master in Electrical Power Engineering, Electrical Engineering and electromechanics
<b>The official name of the educational program</b>	Electrical Systems and Complexes of Vehicles
<b>Type of diploma and scope of the educational program</b>	Master's degree, single, 90 ECTS credits, study period 1 year 4 months
<b>availability of accreditation</b>	Ministry of Education and Science of Ukraine Certificate of accreditation UD No. 21002010 The certificate is valid until 01.07.2023.
<b>Cycle / level</b>	Second (master's) level NQF of Ukraine - level 7 FQ-EHEA - second cycle EQF-LLL - level 7
<b>Requirements for the level of education of the applicant</b>	Bachelor's degree, specialist degree general rules of prerequisites for entry
<b>Language (s) of instruction</b>	Ukrainian
<b>Duration of the educational program</b>	5 years
<b>Internet address of the permanent posting of the description of the educational program</b>	<a href="https://met.kname.edu.ua/index.php/uk/navchalnyi-protses/osvitni-prohramy">https://met.kname.edu.ua/index.php/uk/navchalnyi-protses/osvitni-prohramy</a>
<b>2 - The purpose of the educational program</b>	
	Training of highly qualified specialists for the urban economy, capable of ensuring territorial development at the national, regional and local levels, capable of developing, proposing and applying innovative approaches in professional activities in the field of electrical systems and vehicle complexes.
<b>3 - Characteristics of the educational program</b>	
<b>Subject area</b>	<i>Object of activity</i> - scientific institutions, institutions and organizations in the field of electrical power engineering, electrical engineering and electromechanics, enterprises of the electrical power complex, electrical engineering and electromechanical companies. The object of study is the processes of production, transmission, distribution and consumption of electrical energy and the processes of

	<p>its transformation in electromechanical systems with an increase in reliability and the use of resource-saving technologies in electrical power, electrical and electromechanical systems.</p> <p><i>The objectives of the training</i> are to train professionals who are able to design, design, operate, maintain a safety culture, perform installation, commissioning and repair, create new equipment and introduce the latest technologies, conduct research and carry out teaching activities.</p> <p>The theoretical content of the subject area is fundamental knowledge of the theory of electrical engineering, modeling and optimization of electric power, electrical and electromechanical systems and complexes, their use for innovation and research of operating modes of power plants, networks and systems, electrical machines and electric drives.</p> <p><i>Methods, means and technologies</i> - methods and means of researching processes in equipment in electric power and electromechanical systems and complexes, computer-aided design, design and production.</p> <p><i>Tools and equipment</i> - means, devices, systems, technologies of design, operation, control, monitoring.</p>
<b>Orientation of the educational program</b>	Educational and professional
<b>The main focus of the educational program and specialization</b>	<p>General education in the field of electrical systems and vehicle complexes.</p> <p>Key words: innovative technologies, unmanned systems, control systems, transport, vehicles, diagnostics, development, complexes.</p>
<b>Features of the program</b>	The program was developed taking into account regional characteristics and with the aim of training specialists for solving problems in the field of electrical systems and vehicle complexes. Takes into account modern requirements for solving practical issues by using the acquired knowledge. Forms specialists with new promising means of thinking, capable of applying not only existing research methods, but also developing new ones based on modern scientific achievements.
<b>4 - suitability of graduates to employment and further training</b>	
<b>Employability</b>	<p>Professions, professional titles of work (according to the current edition of the National Classifier of Ukraine: Classifier of professions (DK 003: 2010):</p> <ul style="list-style-type: none"> <li>- electrical engineers (2143.2)</li> <li>- engineers (other branches of engineering) (2149.2)</li> <li>- engineers in the field of electronics and telecommunications (2144.2).</li> </ul>
<b>Further training</b>	-
<b>5 - Teaching and Assessment</b>	
<b>Teaching and Learning</b>	Student-centered learning, problem-oriented learning, lectures, practical exercises, laboratory work, independent work, consultations, project work, preparation of qualification work.
<b>Evaluating</b>	<p>Current control: oral and written survey, tests, presentations of individual assignments.</p> <p>Final control: written exams and differential credits, defense of term papers and practice reports.</p> <p>Attestation: public defense of qualifying work.</p>
<b>6 - Program competencies</b>	

<b>Integral competence</b>	The ability to solve complex specialized tasks and practical problems in a certain area of professional activity or in the learning process, provides for the application of certain theories and methods of the relevant science and is characterized by the complexity and uncertainty of conditions
<b>General competences (GC)</b> defined by the standard of higher education of the specialty	<p>GC 1. Ability for abstract thinking, analysis and synthesis.</p> <p>GC 2. Ability to search, process and analyze information from various sources.</p> <p>GC 3. Ability to use information and communication technologies.</p> <p>GC 4. Ability to apply knowledge in practical situations.</p> <p>GC 5. The ability to use a foreign language in the professional sphere for the implementation of scientific and technical activities.</p> <p>GC 6. Ability to make informed decisions;</p> <p>GC 7. Ability to learn and master modern knowledge.</p> <p>GC 8. Ability to identify and assess risks</p> <p>GC 9. Ability to work autonomously and in a team.</p> <p>GC 10. Ability to identify feedbacks and adjust their actions based on them.</p>
<b>Professional competencies of the specialty (PC)</b> , defined by the standard of higher education specialty	<p>PC 1. The ability to apply the obtained theoretical knowledge, scientific and technical methods to solve scientific and technical problems and problems of the electric power industry, electrical engineering and electromechanics.</p> <p>PC 2. Ability to apply existing and develop new methods, techniques, technologies and procedures for solving engineering problems of the electric power industry, electrical engineering and electromechanics.</p> <p>PC 3. Ability to plan, organize and conduct scientific research in the field of electrical power engineering, electrical engineering and electromechanics.</p> <p>PC 4. Ability to develop and implement measures to improve reliability, efficiency and safety in the design and operation of equipment and facilities of the electric power industry, electrical engineering and electromechanics.</p> <p>PC 5. Ability to analyze technical and economic indicators and expertise of design solutions in the field of electric power engineering, electrical engineering and electromechanics.</p> <p>PC 6. Ability to demonstrate knowledge and understanding of mathematical principles and methods required for use in electrical power engineering, electrical engineering and electromechanics.</p> <p>PC 7. Ability to demonstrate awareness of intellectual property and contracting issues in the electricity, electrical and electrical engineering industries.</p> <p>PC 8. Ability to investigate and identify the problem and identify constraints, including those related to environmental, sustainable development, health and safety issues and risk assessments in the electric power industry, electrical engineering and electromechanics.</p> <p>PC 9. Ability to understand and take into account social, environmental, ethical, economic and commercial considerations affecting the implementation of technical solutions in the electric power industry, electrical engineering and electromechanics.</p> <p>PC 10. Ability to manage projects and evaluate their results.</p> <p>PC 11. Ability to assess the indicators of reliability and efficiency of</p>

	<p>functioning of electric power, electrical and electromechanical complexes.</p> <p>PC 12. The ability to develop plans and projects to ensure the achievement of a specific goal, taking into account all aspects of the problem that is being solved, including the production, operation, maintenance and disposal of equipment for electrical and electromechanical complexes.</p> <p>PC 13. Ability to demonstrate awareness and ability to use regulations, norms, rules and standards in the electric power industry, electrical engineering and electromechanics.</p> <p>PC 14. Ability to use software for computer modeling, computer-aided design, computer-aided manufacturing and computer-aided development or design of elements of electrical and electromechanical systems.</p> <p>PC 15. Ability to publish the results of their research in scientific journals.</p>
<b>7 - Programmatic learning outcomes</b>	
<p><b>Programmed learning outcomes</b> defined by the standard of higher education of the specialty</p>	<p>PLO 1. Find options to improve energy efficiency and reliability of electrical and electromechanical equipment and related complexes and systems.</p> <p>PLO 2. Reproduce processes in electric power, electrical and electromechanical systems in their computer modeling.</p> <p>PLO 3. To master new versions or new software designed for computer modeling of objects and processes in electric power, electrical and electromechanical systems.</p> <p>PLO 4. Outline a plan of measures to improve the reliability, safety of operation and extend the resource of electric power, electrical and electromechanical equipment and related complexes and systems.</p> <p>PLO 5. Analyze processes in electric power, electrical and electromechanical equipment and related complexes and systems.</p> <p>PLO 6. To reconstruct the existing electrical networks, stations and substations, electrical and electromechanical complexes and systems in order to increase their reliability, operational efficiency and extend the service life.</p> <p>PLO 7. Own methods of mathematical and physical modeling of objects and processes in electric power, electrical and electromechanical systems.</p> <p>PLO 8. Take into account the legal and economic aspects of research and innovation.</p> <p>PLO 9. Search for sources of resource support for additional training, scientific and innovative activities.</p> <p>PLO 10. Present research materials at international scientific conferences and seminars devoted to modern problems in the field of electric power, electrical engineering and electromechanics.</p> <p>PLO 11. Justify the choice of direction and methodology of scientific research, taking into account modern problems in the field of electric power, electrical engineering and electromechanics.</p> <p>PLO 12. Plan and carry out research and innovation projects in the field of electricity, electrical engineering and electromechanics.</p> <p>PRN 13. Participate in joint research and development with foreign scientists and specialists in the field of electrical power engineering, electrical engineering, electromechanics.</p> <p>PLO 14. Adhere to the principles and directions of the strategy for the development of energy security of Ukraine.</p> <p>PLO 15. Combine various forms of research and practical activities in order to bridge the gap between theory and practice, scientific achievements and their practical implementation.</p>

	<p>PLO 16. Adhere to the principles and rules of academic integrity in educational and scientific activities.</p> <p>PLO 17. Demonstrate an understanding of regulations, norms, rules and standards in the field of electricity, electrical engineering and electromechanics.</p> <p>PLO 18. To communicate freely orally and in writing in the state and foreign languages on modern scientific and technical problems of the electric power industry, electrical engineering and electromechanics.</p> <p>PLO 19. To identify problems and identify constraints related to the problems of environmental protection, sustainable development, human health and safety and risk assessments in the field of electricity, electrical engineering, electromechanics.</p> <p>PLO 20. To identify the main factors and technical problems that may interfere with the introduction of modern methods of management of electric power, electrical and electromechanical systems.</p>
<b>8 - Resource support for the implementation of the program</b>	
<b>Staffing</b>	All scientific and pedagogical workers have qualifications in accordance with educational components, experience in practical and scientific and pedagogical activities, regularly improve their skills through participation in scientific projects, conferences, internships in institutions of Ukraine and foreign countries.
<b>Logistics support</b>	The material and technical support of the educational program meets the requirements and provides an opportunity for effective training of applicants.
<b>Information and educational-methodological support</b>	<p>All educational components are provided with educational and methodological materials placed in the corresponding courses on the Moodle distance learning platform.</p> <p>Applicants have free access to modern professional literature and periodicals; Scopus and Web of Science databases; Springer resources; ScienceDirect databases from Elsevier; on the ScienceDirect platform - up to 39 thousand e-books and in the collection of 2088 electronic monographs 2019-2020. editions.</p> <p>The university has an official website where important information, a library, an electronic repository are distributed, students and teachers are provided with access to a distance learning system, to the World Wide Web, etc.</p>
<b>9 - Academic mobility</b>	
<b>National credit mobility</b>	The opportunity to participate in national credit mobility programs in other higher educational institutions of Ukraine, in which masters are trained in the specialty 141 Electricity, electrical engineering and electromechanics, as part of training trainings for acquiring professional competencies, with the possibility of enrolling knowledge under the program of pre-diploma practice (up to 9 ECTS loans)
<b>Міжнародна кредитна мобільність</b>	Opportunity to participate in international credit mobility programs within the framework of agreements on international academic mobility (Erasmus + K1) with Lodz University of Technology, Middle East Technological University (Ankara, Republic of Turkey)
<b>Training of foreign applicants for higher education</b>	In accordance with the Rules for admission to study in KhNUMG them. A.N. Beketova