Educational program Profile

«Electromechanics» from speciality 141 «Power Engineering, Electrical Engineering and Electromechanics»

1 – General Information	
The official name of educational program	Electromechanics
Specialty	141 Power Engineering, electrical engineering and Electromechanics
Branch of knowledge	14 Electrical Engineering
Higher education level and qualification name	Bachelor, Bachelor of Power Engineering, Electrical Engineering and Electromechanics
Type of diploma and volume of educational program	Bachelor's degree, single, 240 ECTS credits, duration of training 3 years 10 months
Availability of accreditation	Ministry of Education and Science of Ukraine, certificate of accreditation УД № 21008298, Validity period to 01.07.2028
Cycle/Level	First (bachelor) level of the NRC of Ukraine – 6 level FQ-EHEA – First cycle EQF-LLL – 6 Level
Requirements to the level of education of entrant	The presence of a junior Bachelor general rules on prerequisites for admission
Language (s) of teaching	Ukrainian
Validity of educational program	5 Years
Internet address	https://met.kname.edu.ua
2 – Aim of educational Program	
Training of highly qualified specialists able to solve specialized problems and solve practical problems during professional activities (in the field of electricity, electrical engineering and electromechanics) or in the learning process, involving theories and methods of physics and engineering and characterized by complexity and uncertainty.	
3 – Characteristics of educational Program	
Domain	Area of electrical Engineering: Power Engineering, Electrical engineering, electromechanics. Objects of study and activity: – Enterprises of electric energy complex, electrotechnical and electromechanical services of organizations; – Production, transmission, distribution and transformation of electrical energy into electrical stations, electrical networks and systems; Electrical equipment, electromechanical and switching equipment, electromechanical and electrotechnical complexes and systems. Training goal: Training of specialists capable of solve specialized tasks and practical problems of electric power, electrical engineering and electromechanics, which involves the use of theories and methods of physics and engineering sciences and is characterized by the complex and Uncertainty. Theoretical domain content: Basic concepts of theory of electrical and electromagnetic circles, modeling, optimization and analysis of operation modes of electrical stations, networks and systems, electrical machines, electric drives, electrical and Electromechanical systems and complexes using traditional and renewable energy sources.

	Methods, methods and technologies: Analytical methods for the calculation of electric circuits, power supply systems, electric machines and devices, control systems for electric energy and electromechanical systems, electrical loads using specialized laboratory equipment, personal computers and other equipment. Tools and equipment: instrumentation, electrical and electronic devices, microcontrollers, computers.
Orientation of educational Program	Educational-professional.
Main focus of educational program and specialization	General education in electricity, electrical engineering and Electromechanics. Key words: Electroenergy, electrotechnical and electromechanical systems, complexes, devices and equipment, control systems of electric drives.
Program features	-
4 – Graduates suitability for employment and further education	
Suitability for employment	Profession, professional names of works (according to the current edition of the National classifier of Ukraine: classifier of professions (ДК 003:2010). Technical specialists-Electricians (3113): - Power Substation Manager; - Electromechanical Service Manager; - Electrician shop; - Techniques-Electrician; - Specialist in the operation of electrical stations, power plants and networks; - Electromechanic; - Electromechanic Group Reloading Machines; - Electromechanic of polling station; - Electromechanic on lifting plants; - Electromechanic Underground District. Working places in the public and private sectors in various spheres of activity, in particular: Production, repair, maintenance and commissioning of electrical equipment; Design of Electric energy and electricity systems; Introduction of modern energy efficient technologies; Creation of systems of computer Management of technological processes; Design and manufacture of electrical machines for automation and Elektromehanotronìcs.
Further training	Obtaining a Master's degree
5 – Teaching and evaluation	
Teaching and Learning	Student-centered learning, problem-oriented learning, lectures, practical classes, laboratory work, independent work, consultations, project work, preparation of qualifying work. Teaching methods: problem-solving, illustrations and demonstrations, partial search, research, practical.
Evaluation	Types of control: current, thematic, periodic, modular, final, self-control. Forms of control: oral and written questioning, including exams; test tasks, including computer testing in the Moodle system; laboratory reports; presentations; protection of term papers and projects, reports on practices; Certification: public defense of qualifying work.
6 – Software competence	

Integrated competence	Ability to solve complex specialized tasks and practical problems during professional activity in the field of electricity, electrical engineering and electromechanics or in the learning process, which involves the application of theories and methods of electrical and Electromechanics and characterized by complexity and uncertainty of conditions.
General competence, defined by higher education standard	К01. The ability to abstract thinking, analysis and synthesis. The ability to abstract thinking, analysis and synthesis. К02. Ability to apply knowledge in practical situations. К03. Ability to communicate in the official language both orally and in writing. К04. Ability to communicate in a foreign language. К05. The ability to find, process, and analyse information from different sources. К06. Ability to identify, put, and solve problems. К07. Ability to work in a team. К08. Ability to work autonomously. К09. Ability to exercise their rights and duties as a member of society, realize the values of civil (free Democratic) society and the necessity of its sustainable development, the rule of law, rights and freedoms of man and citizen in Ukraine. К10. The ability to preserve and increase the moral, cultural, scientific values and achievements of society on the basis of understanding the history and patterns development of the subject domain, its place in the general system of knowledge about nature and society and in the development of Society, technology and technology, use different types and forms of motor activity for active rest and maintenance of a healthy lifestyle.
General competence, determined by a higher education institution	K11. Ability to solve practical problems using computer-aided design and calculation (CAD) systems. K12. Ability to solve practical problems involving methods of mathematics, physics and electrical engineering. K13. Ability to solve complex specialized problems and practical problems related to the operation of electrical systems and networks, electrical part of stations and substations and high voltage equipment. K14. Ability to solve complex specialized problems and practical problems related to the problems of metrology, electrical measurements, operation of automatic control devices, relay protection and automation. K15. Ability to solve complex specialized problems and practical problems related to the operation of electric machines, devices and automated electric drive. K16. Ability to solve complex specialized problems and practical problems related to the problems of production, transmission and distribution of electricity. K17. Ability to develop projects of electric power, electrotechnical and electromechanical equipment with observance of requirements of the legislation, standards and the technical task. K18. Ability to perform professional duties in compliance with the rules of safety, labor protection, industrial sanitation and environmental protection. K19. Awareness of the need to increase the efficiency of electrical, electrical and electromechanical equipment. K20. Awareness of the need to constantly expand their knowledge of new technologies in power engineering, electrical engineering and electromechanics.

	K21. Ability to promptly take effective measures in emergency (emergency) situations in power and electromechanical systems.
	K22. Ability to justify the choice of electrical equipment based on microcircuit solutions to solve specialized problems for mechatronic systems, critically evaluate the results and defend the decisions made. K23. Ability to investigate the problem and identify limitations, including those caused by the problems of sustainable development of automatic control systems of electrical systems. K24. Ability to design systems and their elements taking into account all aspects of the task, including the creation, commissioning, operation, maintenance of electric drives. K25. Ability to identify, classify and describe the operation of electromechanical systems and components using analytical methods and computer simulation methods.
7 – Program Learning Objectives	
Program Learning Objectives, Standards of higher education are defined	PLO 1. Know and understand the principles of operation of electrical systems and networks, power equipment of power plants and substations, protective grounding and lightning protection devices and be able to use them to solve practical problems in professional activities. PLO 2. Know and understand the theoretical foundations of metrology and electrical measurements, the principles of operation of automatic control devices, relay protection and automation, have the skills to carry out appropriate measurements and use these devices to solve professional problems. PLO 3. Know the principles of operation of electrical machines, apparatus and automated electric drives and be able to use them to solve practical problems in professional activities. PLO 4. Know the principles of operation of bioenergy, wind power, hydropower and solar power plants. PLO 5. Know the basics of the theory of the electromagnetic field, methods for calculating electrical circuits and be able to use them to solve practical problems in professional activities. PLO 6. Apply application software, microcontrollers and microprocessor technology to solve practical problems in professional activities. PLO 7. Analyze processes in electric power, electrical and electromechanical equipment, corresponding complexes and systems. PLO 8. Select and apply suitable methods for analyzing and synthesizing electromechanical and electrical power systems with specified performance. PLO 9. To be able to assess the energy efficiency and reliability of the electric power, electrical and electromechanical systems. PLO 10. Find the necessary information in scientific and technical literature, databases and other sources of information, assess its relevance and reliability. PLO 11. Communicate fluently on professional problems in Ukrainian and foreign languages orally and in writing, discuss the results of professional activities with specialists and non-specialists, argue their position on debatable issues. PLO 12. Understand the basic principles and tasks of technical and environmental safety of electrical and electromechanical facilities, take them into account when making decisions. PLO 13. Understand the importance of traditional and renewable energy for the successful economic development of the country.

	PLO 14. Understand the principles of European democracy and respect for the rights of citizens, take them into account when making decisions. PLO 15. Understand and demonstrate good professional, social and emotional behavior and maintain a healthy lifestyle. PLO 16. Know the requirements of regulatory enactments related to engineering, intellectual property protection, labor protection, safety and industrial sanitation, and take them into account when making decisions. PLO 17. Solve complex specialized tasks for the design and maintenance of electromechanical systems, electrical equipment for power plants, substations, systems and networks. PLO 18. Be able to study independently, acquire new knowledge and improve skills in working with modern equipment, measuring equipment and applied software. PLO 19. Use suitable empirical and theoretical methods for reducing losses of electrical energy during its production, transportation, distribution and use.
	PLO 20. Demonstrate knowledge and understanding of the mathematical principles that are based on electromechanics and mechatronics. PLO 21. Improving the skills of the foundations of professionally oriented disciplines of the specialty in the field of the theory of electric drive, the theory of automatic control, production processes, conversion of electrical energy, efficient energy consumption at municipal enterprises. PLO 22. Have deep knowledge in the field of electromechanics: electromechanical automation systems and electric drives, electromechanotronics and automated production control systems. PLO 23. Demonstrate an understanding of the impact of technical solutions in a public and social context in utilities.
8 – Resource support for implementation of the program	
Staffing support	All scientific and pedagogical workers have qualification according to educational components, experience of practical and scientific and pedagogical activity, regularly improve their qualification through participation in scientific projects, conferences, internships in institutions of Ukraine and foreign countries.
Material and technical support	Logistics of the educational program meets the requirements and provides an opportunity for effective training of applicants. The educational process uses specialized laboratories equipped with multimedia installations, models, models, laboratory equipment for laboratory work: "Laboratory of oil and natural gas transportation", "Laboratory of gas and heat systems and air conditioning", etc.
Information and educational and methodological support	All educational components are provided with teaching materials posted in the relevant courses on the distance learning platform Moodle https://dl.kname.edu.ua/. Applicants have free access to modern professional literature and periodicals; Scopus and Web of Science databases; Springer resources; ScienceDirect databases from Elsevier publishing house; on the ScienceDirect platform - up to 39 thousand e-books and a collection of 2088 electronic monographs 2019-2020 editions. The official website http://kname.edu.ua operates at the university, where important information is disseminated; library http://library.kname.edu.ua/index.php/uk/; electronic repository http://eprints.kname.edu.ua; applicants and teachers are provided with access to the World Wide Web. All teaching materials are available to students in the reading rooms of

	the scientific library, including the information service room, which is equipped with computers with access to the Internet and the local network of the University.
9 – Academic Mobility	
National Credit Mobility мобільність	In accordance with the Regulations on academic mobility of students, graduate students, doctoral students, research and teaching staff and researchers.
International Credit Mobility	Opportunity to participate in international credit mobility programs under international academic mobility agreements.
Training of foreign higher education applicants	In accordance with the Rules of admission.