

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 in power engineering, electrical engineering and electromechanics
Type of diploma and volume of educational program	Bachelor's degree, single, 180 ECTS credits, duration of training 2 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 NRC of Ukraine – 7 level FQ-EHEA – First cycle EQF-LLL – 6 Level
Requirements to the level of education of entrant	Having a Junior Bachelor's degree General rules for entry requirements
Language (s) of teaching	Ukrainian
Validity of educational program	5 Years
2 – Aim of educational Program	
	Ability to solve specialized tasks and solve practical problems during professional activity in the field of electricity, electrical engineering and electromechanics or in training, which involves the use of theories and methods of physics and of engineering sciences and are characterized by complex and uncertain conditions.
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 solving 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 circuits, modeling,

	<p>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.</p> <p>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.</p> <p>Tools and equipment: instrumentation, electrical and electronic devices, microcontrollers, computers.</p>
Orientation of educational Program	Educational-professional
Main focus of educational program and specialization	<p>General education in electricity, electrical engineering and electromechanics.</p> <p>Key words: electroenergy, electrotechnical and electromechanical systems, complexes, devices and equipment, control systems of electric drives.</p>
Program features	-
4 – Graduates ' suitability for employment and further education	
Suitability for employment	<p>Profession, professional names of works (according to the current edition of the National classifier of Ukraine: classifier of professions (ДК 003:2010).</p> <p>3113):</p> <ul style="list-style-type: none"> - Power Substation Manager; - Electromechanical Service Manager; - Electrician shopper; - 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. <p>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 Electroenergy 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.</p>
Further training	Obtaining a Master's degree
5 – Teaching and evaluation	
Teaching and Learning	Lectures, laboratory works, practical classes, independent work on the basis of textbooks, manuals and lecture notes, consultations with teachers, preparation of qualifying work.

Evaluation	Written and oral exams, laboratory reports, oral presentations, current control, protection 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	<p>K01. The ability to abstract thinking, analysis and synthesis. The ability to abstract thinking, analysis and synthesis.</p> <p>K02. Ability to apply knowledge in practical situations.</p> <p>K03. Ability to communicate in the official language both orally and in writing.</p> <p>K04. Ability to communicate in a foreign language.</p> <p>K05. The ability to find, process, and analyse information from different sources.</p> <p>K06. Ability to identify, put, and solve problems.</p> <p>K07. Ability to work in a team.</p> <p>K08. Ability to work autonomously.</p> <p>K09. 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.</p> <p>K10. 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.</p>
General competence, determined by a higher education institution	<p>K11. The ability to use basic provisions of conflictology and conflicts management technology in conflict analysis.</p> <p>K12. The ability to formulate a system of knowledge about the city as a holistic organism, covering three subsystems: ecological, technical and social.</p> <p>K13. Ability to analyze and solve tasks in the sphere of economic and socio-labor relations.</p> <p>K14. Ability to identify knowledge and understanding of the fundamentals of modern economy functioning on micro-, meso-, macro-and international levels.</p> <p>K15. Ability to use rational-critical thinking to analyse the political events of today.</p> <p>K16. Ability to protect intellectual property.</p> <p>K17. Ability to analyze social reality through the prism of sociological rational thinking.</p> <p>K18. The ability to understand the principles and norms of law and use them in professional activities.</p>
Vocational competence of the speciality, defined by higher education standard	<p>K19. Ability to solve practical problems using computer-aided design and calculation systems (SAPR).</p> <p>K20. Ability to solve practical problems involving methods of mathematics, physics and electrical engineering.</p>

	<p>K21. The ability to solve complex specialized problems and practical problems associated with the work of electrical systems and networks, the electrical part of stations and substations and high voltages.</p> <p>K22. Ability to solve complex specialized tasks and practical problems connected with problems of metrology, electrical measurements, operation of automatic control devices, relay protection and automation.</p> <p>K23. The ability to solve complex specialized tasks and practical problems associated with the work of electric machines, apparatuses and automated electric drive.</p> <p>K24. Ability to solve complex specialized tasks and practical problems connected with the problems of production, transmission and distribution of electric energy.</p> <p>K25. Ability to develop projects of electric energy, electrotechnical and electromechanical equipment in compliance with the requirements of legislation, standards and technical specification.</p> <p>K26. Ability to perform professional duties in compliance with the requirements of safety rules, labor protection, industrial sanitation and environmental protection.</p> <p>K27. Awareness of the need to improve the efficiency of electric energy, electrotechnical and electromechanical equipment.</p> <p>K28. Awareness of necessity to constantly expand own knowledge about new technologies in electric power engineering, electrical engineering and electromechanics.</p> <p>K29. Ability to quickly take effective measures in the emergency (emergency) situations in the electrical and electromechanical systems.</p>
<p>Professional competence of speciality, determined higher education institution</p>	<p>K30. Ability to argue the choice of electrical equipment on the basis of microcircuit-making solutions for solving specialized tasks on energy supply of receivers, critically assess the results and protect the decisions.</p> <p>K31. Ability to investigate the problem and determine restrictions, including caused by problems of sustainable development of automatic control systems of electrical complexes.</p> <p>K32. Ability to project systems and their elements taking into account all aspects of the task, including creation, commissioning, operation, maintenance of electric drives.</p> <p>K33. Ability to identify, classify and describe the work of electromechanical systems and components through the use of analytical methods and methods of computer simulations.</p>
<p>7 – Program Learning Outcomes</p>	
<p>Program Learning Outcomes, Standards of higher education are defined</p>	<p>PR01. To know and understand the principles of electrical systems and networks, power equipment of electric stations and substations, protective earthing devices and lightning protection and to use them to solve practical problems in professional activities.</p> <p>PR02. To know and understand the theoretical foundations of metrology and electrical measurements, principles of automatic control devices, relay protection and automatics, have the skills of carrying out the appropriate measurements and use of these devices to solve professional tasks.</p>

	<p>PR03. To know the principles of electric machines, devices and automated electric drives and can use them to solve practical problems in professional activities.</p> <p>PR04. To know the principles of bioenergy, wind energetic, hydropower and solar energy installations.</p> <p>PR05. To know the basics of electromagnetic field theory, calculation methods of electric circuits and use them to solve practical problems in professional activities.</p> <p>PR06. To use application software, microcontrollers and microprocessor equipment to solve practical problems in professional activities.</p> <p>PR07. To carry out the analysis of processes in the electric energy, electrical and electromechanical equipment, appropriate complexes and systems.</p> <p>PR08. To choose and apply suitable methods for the analysis and synthesis of electromechanical and power systems with given parameters.</p> <p>PR09. To be able to assess energy efficiency and reliability of electric energy, electrical and electromechanical systems.</p> <p>PR10. To find necessary information in scientific and technical literature, databases and other sources of information, to assess its relevance and authenticity.</p> <p>PR11. Freely communicate with professional problems in the State and foreign languages orally and writing, discuss the results of professional activities with specialists and experts, argue their position on discussion issues.</p> <p>PR12. To understand the basic principles and tasks of technical and environmental safety of electrical and electromechanical objects, take them into account when making decisions.</p> <p>PR13. To understand the importance of traditional and renewable energy for the successful economic development of the country.</p> <p>PR14. To understand the principles of European democracy and respect for the rights of citizens, take them into account when making decisions.</p> <p>PR15. To understand and demonstrate good professional, social and emotional behavior, to adhere to a healthy lifestyle.</p> <p>PR16. To know the requirements of normative acts relating to engineering activities, protection of intellectual property, occupational safety, security and industrial sanitation, to take them into account when making decisions.</p> <p>PR17. To solve complex specialized tasks for the design and maintenance of electromechanical systems, electrical power stations, substations, systems and networks.</p> <p>PR18. To be able to learn, to master new knowledge and to improve skills of working with modern equipment, measuring technology and application software.</p> <p>PR19. To use suitable empirical and theoretical methods to reduce the loss of electrical energy in its production, transportation, distribution and use.</p>
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<p>Program Learning Outcomes, Higher educational institution</p>	<p>PR20. To demonstrate knowledge and understanding of mathematical principles underlying electromechanics and mehanotroniky. PR21. Improvement of skills of basics of professionally oriented disciplines in the field of electric drive theory, theory of automatic control, processes of production, conversion of power energy, effective energy use in enterprises Municipal economy. PR22. To have in-depth knowledge in the field of Electromechanics: Electromechanical automation systems and electric drive, Elektromehanotronik and automated production management systems. PR23. To demonstrate understanding of the impact of technical decisions in social and social context at communal enterprises. PR24. To possess the methods of conducting experiments, collecting data and modeling in electromechanical systems. PR25. To adhere to design methodologies and relevant regulatory documents, current standards and technical specifications. PR26. To explain the current state of affairs and the latest technologies in the field of electrical engineering. PR27. To understand the principles of economic science, especially the functioning of economic systems. PR28. To apply conflicts management skills in professional activities, tools and strategies for their regulation and solution. PR29. To analyse the role and significance of the modern city in the context of global and local challenges. PR30. To apply the basic provisions of political science in solving professional problems. PR31. To apply basic provisions and methods of sociological science in solving professional problems. PR32. To use normative and legal acts regulating professional activity. PR33. To analyze the processes of legal and market regulation of socio-economic labor relations. PR34. To possess basic techniques of intellectual property protection; Apply rules for registration of intellectual property rights. PR35. Effectively communicate in a foreign language in business environment. PR36. To use linguistic, speech, linguocultural and communicative skills for effective foreign language communication. PR37. To be able to use normative-legal acts regulating legal support of economic relations.</p>
8 – Resource support for implementation of the program	
<p>Staffing support</p>	<p>Over 70% of scientific and pedagogical staff involved to teaching vocational-oriented disciplines, have scientific degrees in the specialty</p>
<p>Material and technical support</p>	<p>The use of modern equipment of leading electromechanical companies, in particular Schneider Elecris</p>
<p>Information and educational and methodological support</p>	<p>Use of distance learning system, electronic repository and author's development of teaching staff.</p>
9 – Academic Mobility	

National Credit Mobility	Possibility to participate in national credit mobility programs in other higher educational establishments of Ukraine, which train bachelors in specialty 141 power engineering, electrical engineering and electromechanics, within the framework of educational Trainings for acquiring professional competences, with the possibility of enrollment of educational achievements in the program of production and pre-diploma practice (total up to 11 ECTS credits).
International Credit Mobility	Possibility of participation in programs of international credit mobility within Erasmus + International Credit Mobility with the Middle East Technological University (Ankara, Turkey), Lodz Technical University (Lodz, Poland).
Training of foreign higher education applicants	-