

**The Profile of the Educational Program in Specialty 141 «Power engineering, electrical engineering and electric mechanics»,
the educational program
«Lighting and lighting design »**

General information	
Full name of the institution of higher education	O.M.Beketov National University of Urban Economy in Kharkiv
Higher education degree and title in the original language	Bachelor of Power engineering, electrical engineering and electric mechanics
Official name of educational program	Lighting and lighting design
Type of diploma and scope of educational program	Bachelor's diploma, single, 240 ECTS credits, 3 year 10 months
Accreditation availability	Ministry of Education and Science of Ukraine Certificate of accreditation УД №21008296 The certificate expires on 01.07.2028
Cycle/level	First (Bachelor's degree) level FQ-EHEA – cycle 1 EQF-LLL level 6
Access requirements	Complete secondary education Specialist's degree
Language(s) of instruction	Ukrainian
Official length of program	5 years
Internet address of the permanent placement of the educational program description	http://sds.kname.edu.ua
Purpose of educational program	
The training of qualified specialists for the urban economy in the field of the lighting industry of electrical engineering provides for the application of theories and methods of modern electric power, electrical engineering and electromechanics to ensure territorial development at the national, regional and local levels.	
Educational program specifications	
Subject area	<p><i>Objects of study and activity:</i></p> <ul style="list-style-type: none"> – enterprises of electric energy complex, electrical engineering and electric mechanics services of organizations; – production, transmission, distribution and transformation of electric energy on the electric stations, in electric networks and systems; electrical engineering equipment, electric mechanics and interconnect equipment, electric mechanics and electrical engineering complexes and systems. <p><i>Aim of studies:</i></p> <p>Preparation of specialists, able to decide the specialized tasks and practical problems of electric energy, electrical engineering and electric mechanics that envisages application of theories and methods of physics</p>

	<p>and engineering sciences and is characterized a complexity and vagueness of terms.</p> <p><i>Theoretical maintenance of subject domain:</i> base concepts of the theory of electric and electromagnetic circles, design, optimization and analysis of the modes of operations of the electric stations, networks and systems, electric machines, electric mechanics, electrical engineering and electric mechanics systems and complexes that use traditional and alternative energy sources.</p> <p><i>Methods, methodologies and technologies:</i> analytical methods of calculation of electric circles, systems of power supply, electric machines and vehicles, control system, electric loading by the electric energy and electric mechanics systems with the use of the specialized laboratory equipment, personal computers and other equipment.</p> <p><i>Instruments and equipment:</i> control and measuring facilities, electric and electronic devices, microcontrollers, computers.</p>
Orientation of the educational program	Educationally-professional
Main focus of educational program and specialization	<p>General education in the field of electric power, electrical engineering and electromechanics with in-depth study of lighting and lighting design of urban infrastructure with the use of modern information technologies.</p> <p>Key words: electric power systems, electrotechnical systems, electromechanical systems, light sources, lighting systems and installations, lighting devices and lighting environment design.</p>
Program features	The laboratory practicum is conducted on a stationary equipment of such companies as Elko (Czech Republic), iGuzzini (Italy), LTD "LED technology by Ukraine" and other with application of computer methods by treatment results measuring.
Professional status of graduates and access to further study	
Suitability for employment	<p>Professions, professional names of works (according to the operating release of the National classifier of Ukraine: Classifier of professions (ДК 003: 2010) :</p> <p>Technical specialists-electricians (3113) :</p> <ul style="list-style-type: none"> – a controller of electric substation; – an electrician of area; – an electrician of workshop; – a power engineering specialist; – a power engineering specialist of production; – a power engineering specialist of area; – a power engineering specialist of workshop; – an energy controller; – a technician from exploitation of biopower options; – a technician from exploitation of hydro energetic options; – a technician from exploitation of wind energy options; – a technician-electrician; – a power engineering technician-specialist; – a specialist on exploitation of the electric stations, power plants and networks); – a specialist on a power management.

Access to further study	Opportunity to continue studying at the second (master's) level of higher education. Acquisition of additional qualifications in the system of postgraduate education, advanced training.
Instruction and assessment	
Teaching and learning	Lectures, laboratory work, practical classes, independent work based on textbooks, manuals and lecture notes, consultations with teachers, preparation of master's work.
Assessment	The grading system through oral and written examinations, tests, placements, project work and more.
Program learning outcomes	
Program learning outcomes defined by the standard	<ol style="list-style-type: none"> 1. Know and understand working principles of electric systems and networks, power equipment of the electric stations and substations, devices of the protective grounding and protecting from lightning and able to use them for the decision of practical problems in professional activity. 2. Know and understand theoretical bases of metrology and electric measuring, principles of work of automatic control, relay protecting and automation units, have skills of realization of the corresponding measuring and use of the marked devices for the decision of professional tasks. 3. Know working principles of electric machines, vehicles and automatic electric drives and able to use them for the decision of practical problems in professional activity. 4. Know working principles of biopower, wind energy, hydro energetic and sunny power plants. 5. Know bases of the electromagnetic fields theory, methods of electric circles calculation and able to use them for the decision of practical problems in professional activity. 6. Apply application software, microcontrollers and microprocessor-based technique for the decision of practical problems in professional activity. 7. Carry out the analysis of processes in an electric energy, electrical engineering and electric mechanics equipment, corresponding complexes and systems. 8. Select and apply suitable methods for an analysis and synthesis of the electric mechanics and electric energy systems with the set indexes. 9. Able to estimate energy efficiency and working reliability of the electric energy, electrical engineering and electric mechanic systems. 10. Find necessary information in scientific and technical literature, databases and other information generators, to estimate it relevant and authenticity. 11. Freely to communicate from professional problems by official and foreign languages orally and in writing, to discuss the results of professional activity with specialists and subspecialists, to argue the position on debatable questions. 12. Understand basic principles and tasks of technical and ecological safety for objects of the electrical engineering and electric mechanic; take into account them at making decision. 13. Understand the value of traditional and alternative energy for successful economic development of country. 14. Understand principles of European democracy and respect to the rights for citizens; take into account them at making decision. 15. Understand and demonstrate kind professional, social and emotional behavior, adhere to the healthy way of life.

	<p>16. Know the requirements of normative acts that touch engineering activity, protecting of intellectual property, labor, accident and productive sanitation prevention protection; take into account them at making decision.</p> <p>17. Decide the intricate specialized problems from planning and technical maintenance of the electric mechanic systems, electrical equipment of the electric stations, substations, systems and networks.</p> <p>18. Able independently to study, to seize new knowledge and perfect skills of work with modern equipment, measuring technique and application software.</p> <p>19. Apply suitable empiric and theoretical methods for reduction of electric energy losses at her production, transporting, distribution and use.</p> <p>20. Execute measuring, calculations of lightning technology descriptions and electrical engineering equipment and determine the mathematical methods for decision of lightning technology and electric energy tasks.</p> <p>21. Conduct the previous feasibility study of project, execute a calculation and planning of the lighting installation of building, systems of illumination for utilitarian, decoratively-artistic and advertisement setting in accordance with a requirement specification with the use of normatively-technical documentation and facilities of computer-aided design.</p>
Resource support for program implementation	
Staffing	The educational program is provided with scientifically-pedagogical workers: by the doctors of sciences, candidates of sciences. All teachers of profile department passed scientifically-pedagogical internship during from a few weeks to 6 months.
Logistics	<p>Meets the requirements and provides the opportunity for effective training of applicants.</p> <p>Three laboratories of world level successfully function in the educational process: the "Research center of lightning technology measuring" (from 2014, has a certificate of ISO/IEC from 17.03.2016), "Laboratory of light design" (from 2014poky) and "Laboratory of the intellectual systems of illumination" (from 2019). The first of them is used for the decision of tasks attestation and certification of lightning technology equipment and implementation based on projects of lightning technology; the second is a laboratory that is sent to the decision of tasks tangent forming of light environment and her design. The third laboratory provides realization of laboratory practical works after selective professional disciplines of the educational program. The complex of these laboratories provides a system study and creation of intellectual illumination based on light-emitting-diode technologies.</p>
Information and methodological support	All educational components are provided with educational and methodical materials, placed on the appropriate courses on the distance-learning platform MOODLE. Applicants have free access to modern professional literature and periodicals, Scopus databases and Web of Science.
Academic mobility	
National credit mobility	Opportunity to participate in national credit mobility programs at other universities of the country where bachelors are trained in the specialty 141 Power engineering, electrical engineering and electric mechanics, within the framework of educational trainings, organized and conducted by such universities and facilitating the acquisition of professional

	competences, with the possibility of enrollment of educational achievements by the programs of manufacturing and undergraduate practice (up to 11 ECTS credits).
International credit mobility	Opportunity to participate in international credit mobility programs within the framework of Erasmus + International Credit Mobility with the Middle East University of Technology (Ankara, Turkey), Łódź Technical University (Łódź, Poland)
Training of foreign higher education applicants	In accordance with the Rules of admission of foreign citizens to O.M.Beketov National University of Urban Economy in Kharkiv.