MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
“Igor Sikorsky Kyiv Polytechnic Institute”

APPROVED
Academic Council of "Igor Sikorsky Kyiv Polytechnic Institute"
(Protocol № 3 from 15.03.2021)
Head of Academic Council
_____ Mykhaylo ILCHENKO

ENERGY MANAGEMENT AND ENERGY EFFICIENT TECHNOLOGIES

EDUCATIONAL AND PROFESSIONAL PROGRAM

The first (bachelor's) level of higher education

Speciality	**141 - Electrical Power Engineering, Electrical Engineering and Electromechanics**
Field of knowledge	**14 - Electrical Engineering**
Qualification	**Bachelor of Electrical Power Engineering, Electrical Engineering and Electromechanics**

Put into effect by order of the rector ofIgor Sikorsky Kyiv Polytechnic Institute (Decree № NON/89/2021 from 19.04.2021)

Kyiv – 2021

PREFACE

Developed by a working group

Head of the working group

Denys Derevianko, Candidate of Engineering Sciences (Ph.D.),
Associate Professor of the Department of Electric Power Supply

Members of the working group:

Anatolii Cherniavskyi, Candidate of Engineering Sciences (Ph.D.),
Associate Professor of the Department of Electric Power Supply

Oleh Zakladnyi, Candidate of Engineering Sciences (Ph.D.),
Senior Teacher of the Department of Electric Power Supply

Head of the power supply department

Popov Vladimir, Doctor of Technical Sciences, Associate professor,
Professor of the Department of Electric Power Supply Systems

AGREED:

Scientific and Methodological Commission of Igor Sikorsky Kyiv Polytechnic Institute by specialty 141 - Electric Power Engineering, Electrical Engineering and Electromechanics

Head of the Commission _____ ***Oleksandr YANDULSKYI***

(Protocol № 3 from 17.12.2020)

Methodological Counsil of Igor Sikorsky Kyiv Polytechnic Institute

Head of the Counsil _____ ***Yurii YAKYMENKO***

(Protocol № 6 from 25.02.2021)

According to the results of monitoring the educational-professional program "Electrical power distribution systems engineering" of the second (master's) level of higher education in the specialty 141 Electrical power engineering, electrical engineering and electromechanics, approved by the decision of the Academic Council from 02.04.2018, protocol № 4, taking into account the proposals of the members of the educational process, which are involved in the implementation of the educational program, the proposals of graduates, employers and other external stakeholders, it was updated.

The project team reviewed the balance, rational use of credits, the ability of students to master certain disciplines (educational components) and the entire educational program, to keep within the certain time, the completeness of documentary, staffing, information, other forms of the educational program support and compliance of the educational program with the License Conditions.

To ensure the possibility of forming an individual educational trajectory, including the individual choice of academic disciplines in the amount provided by law, it was decided to replace the existing sample units by the separate educational components.

The educational-professional program "Electrical power distribution systems engineering" was discussed and approved by teaching staff of the Department of Electric Power Supply Systems (Protocol № 7 from 17.12.2020).

TABLE OF CONTENT

1. EDUCATIONAL PROGRAM PROFILE

Speciality: 141 - Electrical Power Engineering, Electrical Engineering and Electromechanics

1 – General information	
Full name of the Institution of Higher Education and Institute / Faculty	National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Institute of Energy Saving and Energy Management
Higher education degree and title of qualification in the original language	Degree – bachelor Qualification - Bachelor of Electrical Power Engineering, Electrical Engineering and Electromechanics
The official name of the educational program	Energy management and energy efficient technologies
Type of diploma and scope of educational program	Bachelor's diploma, single, 240 credits, term of study 3 years 10 months
Availability of accreditation	Certificate of accreditation НД -IV № 1158095, issued by the Ministry of Education and Science of Ukraine Accreditation period since 30.05.2013 till 01.07.2023
Cycle / level of Higher Education	NRC of Ukraine - level 6 QF-EHEA - the first cycle EQF-LLL – level 6
Background	Degree of complete general secondary education
Language (s) teaching	Ukrainian
Term of the educational program	Until the next accreditation
Internet address of the permanent placement of the educational program	http://ep.kpi.ua/ department website http://osvita.kpi.ua/ section of educational programs
2 – The purpose of the educational program	
Training of specialists capable of solving complex specialized problems and practical problems in the power industry and carrying out professional activities in the specialty 141 " Electrical Power Engineering, Electrical Engineering and Electromechanics " in terms of sustainable innovative scientific and technical development of society. Training of specialists capable of solving complex specialized theoretical and practical problems in the field of energy efficiency in all industries and housing and communal services; capability to carry out professional activity in the conditions of liberalization of the electricity market with the sources of distributed generation integrated into the unified energy system of Ukraine; to introduce the latest technologies of design, construction and operation of energy efficient systems of power consumption;	

development and implementation of energy management systems according to ISO 50001; qualitatively and qualifiedly conduct energy audits (based on the requirements of international standards) and energy audits of industrial enterprises, buildings and structures.	
3 – Educational program characteristics	
Subject area	**Objects of study and activity:** - enterprises of the energy sector, electrotechnical and electromechanical services of the organizations; - production, transmission, distribution and conversion of electricity at power plants, power grids and systems; electrotechnical equipment, electromechanical and switching equipment, electromechanical and electrotechnical complexes and systems. **Study objective:** Training of specialists capable of solving specialized problems and practical problems of Electrical Power Engineering, Electrical Engineering and Electromechanics, which involves the application of theories and methods of physics and engineering and is characterized by complexity and uncertainty of conditions. **Theoretical content of the subject area:** basic concepts of the theory of electric and electromagnetic circuits, modeling, optimization and analysis of modes of operation of power plants, networks and systems, electric machines, electric drives, electrotechnical and electromechanical systems and complexes using traditional and renewable energy sources. **Methods, techniques and technologies:** analytical methods for calculating electrical circuits, power supply systems, electrical machines and apparatus, control systems for electrical and electromechanical systems, electrical loads using specialized laboratory equipment, personal computers and other equipment. **Tools and equipment:** measuring instruments, electrical and electronic devices, microcontrollers, computers.
Orientation of the educational program	Educational and professional
The main focus of the educational program and specialization	***The main focuses of the program:*** 1. Enhanced training in Electrical Power Engineering, Electrical Engineering and Electromechanics. 2. Enhanced training in the field of providing consumers with electricity, taking into account energy saving factors and improving energy efficiency. 4. Fundamental training in the design, construction and operation of energy efficient power supply systems.

	5. Fundamental training in the operation of electrical and electric technical equipment. 6. Application of methods and means of energy efficiency indicators, energy consumption monitoring and conducting the energy audits. 7. Fundamental training in the development and implementation of energy efficiency measures and technologies in the field of distribution and conversion of electricity and heat energy. 8. Fundamental training in the design and use of renewable energy sources. 9. Work plans for training higher education seekers are reviewed annually to include sections related to the development of knowledge and current trends in the field of power supply to consumers on the basis of benchmarking and the results of analysis of new scientific and technological and educational achievements. **Keywords:** electric energy, thermal energy, energy efficiency, energy management, energy efficient technologies, energy audit, power supply systems, energy saving in industry, energy saving in buildings and structures, energy market
Features of the Educational Program	1. Enhanced training in the field of natural sciences (mathematics, physics), as well as technical sciences (electrical engineering, electrical measurements, information technology, power electronics). 2. Fundamental training in the design, construction and operation of systems for providing consumers of industrial enterprises, cities and facilities of the agricultural complex with electricity, taking into account the factors of economy, reliability, quality and energy efficiency. 3. Study of the possibility and economic feasibility of increasing the levels of energy efficiency of industry and housing and communal services by implementing appropriate measures, the feasibility of which is based on indicators of economy, environmental friendliness, energy efficiency and social factors. 4. The use of elements of dual education, in particular, interuniversity programs with the world's leading institutions and internships at leading companies certified according to energy and environmental management standards.

4 – Graduates suitability for employment and further education	
Suitability for employment	According to the classifier of professions ДК003: 2010 graduates can perform the following types of professional work: 3113 Specialist in the operation of power plants, electrical equipment and networks 3113 Energy Management Specialist 3113 Power engineer 3111 Specialist in energy management in buildings 3111 Specialist in non-traditional energy Possible professional certification
Further education	Continuation of education at the second (master's) level of higher education and / or acquisition of additional qualifications in the system of postgraduate education).
5 – Teaching and assessment	
Teaching and study	Lectures, practical and seminar classes, computer workshops and laboratory works; course projects and works; technology of blended learning, practice and excursions; execution of diploma project (work)
Assesment	Current and semester control in the form of laboratory reports, presentations, written and oral examinations and defense of qualification work are evaluated in accordance with the defined criteria of the Rating system
6 – Program competencies	
Integral competence	Ability to solve specialized problems and solve practical problems during professional activities in the field of Electrical Power Engineering, Electrical Engineering and Electromechanics or in the study process, which involves the application of theories and methods of physics and engineering and are characterized by complexity and uncertainty.
General competencies	
К1	Ability to abstract thinking, analysis and synthesis
К2	Ability to apply knowledge in practical situations
К3	Ability to communicate in the state language both orally and in writing
К4	Ability to communicate in a foreign language
К5	Ability to search, process and analyze information from various sources
К6	Ability to identify, state and solve problems
К7	Ability to work in a team
К8	Ability to work autonomously
К9	Ability to exercise their rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its

	sustainable development, the rule of law, human and civil rights and freedoms in Ukraine
К10	Ability to preserve and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies. active recreation and a healthy lifestyle
Professional competencies	
К11	Ability to solve practical problems using computer-aided design and calculation (CAD) systems
К12	Ability to solve practical problems involving methods of mathematics, physics and electrical engineering
К13	Ability to solve complex specialized problems and practical problems related to the operation of electrical systems and networks, the electrical part of stations and substations and high voltage equipment
К14	Ability to solve complex specialized problems and practical problems related to the problems of metrology, electrical measurements, the operation of automatic control devices, relay protection and automation
К15	Ability to solve complex specialized problems and practical problems associated with the operation of electric machines, devices and automated electric drive
К16	Ability to solve complex specialized problems and practical problems related to the problems of production, transmission and distribution of electricity
К17	Ability to develop projects of electric power, electrotechnical and electromechanical equipment with observance of requirements of the legislation, standards and the technical task
К18	Ability to perform professional duties in compliance with the requirements of safety, labor protection, industrial sanitation and environmental protection
К19	Awareness of the need to increase the efficiency of electrical, electrical and electromechanical equipment
К20	Awareness of the need to constantly expand their knowledge of new technologies in Electrical Power Engineering, Electrical Engineering and Electromechanics
К21	Ability to promptly take effective measures in emergency situations in power and electromechanical systems
К22	Ability to organize commercial electricity metering, in particular to act as the party responsible for the commercial metering point, and to interact with or perform their role as providers of commercial metering services as defined by the Commercial Electricity Metering Code
К23	Ability to ensure the functioning of energy management systems and efficient use of electricity, to implement energy efficient methods and technologies in accordance with world best practices

К24	Ability to implement advanced intelligent technologies to provide consumers with electricity within the Smart Grid concept
К25	Calculate electrical and technical and economic performance of electrical installations, as well as assess the feasibility of using different types of consumers for a particular process.
К26	Ability to objectively assess the possible positive and negative social, economic, environmental and technical consequences of decisions in the energy management system ;
К27	Ability to analyze and evaluate the level of achieved energy efficiency using energy efficiency indicators and basic levels of energy consumption in the energy management system.
К28	Ability to build energy balances of organizations and determine significant energy consumption to potentially improve energy performance in the energy management system.
К29	Ability to make calculations of works in the field of energy management and energy audit, to develop a feasibility study of energy efficiency measures.
К30	Ability to manage projects in the field of energy management and energy efficiency and evaluate their financial results.
К31	Ability to design power supply systems for industrial enterprises, cities, facilities of the agro-industrial complex, taking into account the factors of resource and energy saving.
К32	Ability to assess electricity losses in the elements of power supply systems and justify measures to reduce them.
К33	Ability to comprehensively address the issues of control of power supply systems in order to provide high-quality and energy-efficient electricity supply to consumers.
К34	The ability to apply new technical solution for about are ktuvanni power supply systems to improve their effectiveness complex.
К35	Ability to identify, research and solve problems in the heat sector, as well as to identify constraints, including those related to engineering aspects and issues of nature protection, sustainable development, health and safety and risk assessments in the heat sector.
К36	Ability to take into account the broader interdisciplinary engineering context in professional activities in the field of heat.
К37	Ability to assess the potential for energy savings at the facility; plan energy saving measures and evaluate their environmental and economic efficiency
К38	Ability to develop and implement energy saving measures in the design and operation of heat and power equipment for various purposes, to calculate the effective modes of their operation
7 – Program study results	
PR1. Know and understand the principles of operation of electrical systems and networks, power equipment of power plants and substations, protective earthing and	

lightning protection devices and be able to use them to solve practical problems in professional activities.
PR2. Know and understand the theoretical foundations of metrology and electrical measurements, the principles of automatic control devices, relay protection and automation, have the skills to perform appropriate measurements and use these devices to solve professional problems.
PR3. Know the principles of operation of electric machines, devices and automated electric drives and be able to use them to solve practical problems in professional activities.
PR4. Know the principles of operation of bioenergy, wind, hydro and solar power plants.
PR5. Know the basics of the theory of the electromagnetic field, methods of calculating electric circuits and be able to use them to solve practical problems in professional activities.
PR6. Use application software, microcontrollers and microprocessor technology to solve practical problems in professional activities.
PR7. To carry out the analysis of processes in the electric power, electrotechnical and electromechanical equipment, the corresponding complexes and systems.
PR8. Select and apply suitable methods for analysis and synthesis of electromechanical and electrical systems with specified parameters.
PR 9. Be able to assess the energy efficiency and reliability of electrical, electrical and electromechanical systems.
PR10. Find the necessary information in the scientific and technical literature, databases and other sources of information, assess its relevance and reliability.
PR11. Communicate freely on professional issues in state and foreign languages orally and in writing, discuss the results of professional activities with specialists and non-specialists, argue their position on issues of discussion.
PR12. Understand the basic principles and objectives of technical and environmental safety
objects of electrical engineering and electromechanics, take them into account when making decisions.
PR13. Understand the importance of traditional and renewable energy for successful economic development of the country.
PR14. Understand the principles of European democracy and respect for the rights of citizens, take them into account in decision-making.
PR15. Understand and demonstrate good professional, social and emotional behavior, follow a healthy lifestyle.
PR16. Know the requirements of regulations relating to engineering, protection of intellectual property, labor protection, safety and industrial sanitation, take them into account when making decisions.
PR17. Solve complex specialized problems in the design and maintenance of electromechanical systems, electrical equipment of power plants, substations, systems and networks.

PR18. Be able to learn independently, acquire new knowledge and improve skills in working with modern equipment, measuring equipment and application software.
PR19. Apply suitable empirical and theoretical methods to reduce electricity losses during its production, transportation, distribution and use.

PR20. Creatively apply: basic knowledge in the field of informatics and modern information technologies, have skills in programming and use of software activities and work in computer networks, use Internet resources and demonstrate the ability to develop algorithms and programs in the field of energy management systems.
PR21. Demonstrate knowledge and understanding of the stages of development and implementation of energy management systems in organizations.
PR22. Know of etod and organization of work and koo was dynatsiyi of staff that caters energy objects and performing work in construction, installation and maintenance of environmental controls explosion and intrinsically safe equipment con so the role of the insulating power networks, means protection, fire and security-fire alarm, lightning protection, notification and evacuation in the event of the sky from furnace situations.
PR23 Be able to arrange the units of electricity metering, in particular, to select and calculate the parameters of means of measurement and metering of electricity, secondary metering circuits, to know and understand the metrological support of commercial electricity metering.
PR24 Understand and be able to apply modern enterprise management systems, in particular, decision support systems, expert systems, software products for current and strategic planning
PR25 Know the legal principles and regulatory framework for the installation of electrical installations, be able to organize and ensure the safe operation of electrical installations of consumers and the safe performance of work in existing electrical installations
PR26 Be able to build and establish business communications in the enterprise, endogenous and exogenous, in particular, departmental communications, communications between levels and departments, to implement the preparation and organization of communication in crisis situations.
PR27 Know the methods of assessment, analysis and planning in energy use, develop energy efficiency measures for production, utilities, commercial and residential sectors, develop energy saving programs that take into account technical, economic, financial and administrative factors.
PR28 Know the sources of investment and financing models for energy efficiency measures in the energy management system.
PR29 Be able to build energy balances of organizations' energy consumption and determine significant energy consumption for potential improvement of energy efficiency in the energy management system.
PR 30 Measure the level of achieved energy efficiency using basic levels of energy consumption and energy efficiency indicators in the energy management system.
PR 31 Be able to perform financial evaluation of energy efficiency projects under

different conditions of investment and financing, calculate capital and current costs, savings from energy efficiency measures, draw up a business plan for an energy efficiency project. PR 32 Be able to plan resources for the implementation of the energy efficiency project, organize the process of its implementation, motivate employees to implement it; manage project implementation; plan quantitative indicators of the energy efficiency project; develop project implementation schedules; control the timing of the project and its costs. PR 33 Analyze market and specific risks of the project, use its results to make management decisions in the energy management system. PR34 To know and understand the methodology of choosing the parameters of the elements of power supply systems of industrial enterprises, cities, agro-industrial complex on the basis of certain design loads and taking into account the factors in resource and energy saving.
PR35 To know the principles and have practical skills to calculate electricity losses in EPS using ASKOE data and to have methods of feasibility study of measures to minimize them. PR36 Know and understand the choice of composition, parameters and modes of operation of reactive power compensation in order to reduce electricity losses during its distribution in power supply systems. PR37 To know the basic perspective ways to increase the efficiency of power supply systems by increasing the rated voltage, optimal loading of elements, use of local energy sources, load management, introduction of new technical means of mode control and information technology. PR38 Identify, formulate and solve engineering problems in heat energy; understand the importance of non-technical (society, health and safety, environment, economy and industry) constraints. PR 39 Develop and design complex products in the heat industry, processes and systems that meet established requirements, which may include awareness of technical and non-technical (society, health and safety, environment, economy and industry) aspects. PR 40 Apply the advanced achievements of electrical engineering and related industries in the design of facilities and processes of thermal power. PR41 Calculate the electrical load and choose the drive of power consumers of electricity (taps, conveyors, pumps, fans, compressors, etc.). PR42 Calculate electrical and technical and economic performance of electrical installations, as well as assess the feasibility of using different types of consumers for a particular process.

8 – Resource support for program implementation	
Staffing	In accordance with the personnel requirements to ensure the implementation of educational activities for the relevant level of HE (Annex 2 to the License Conditions), approved by the Cabinet of Ministers of Ukraine dated 30.12.2015 №

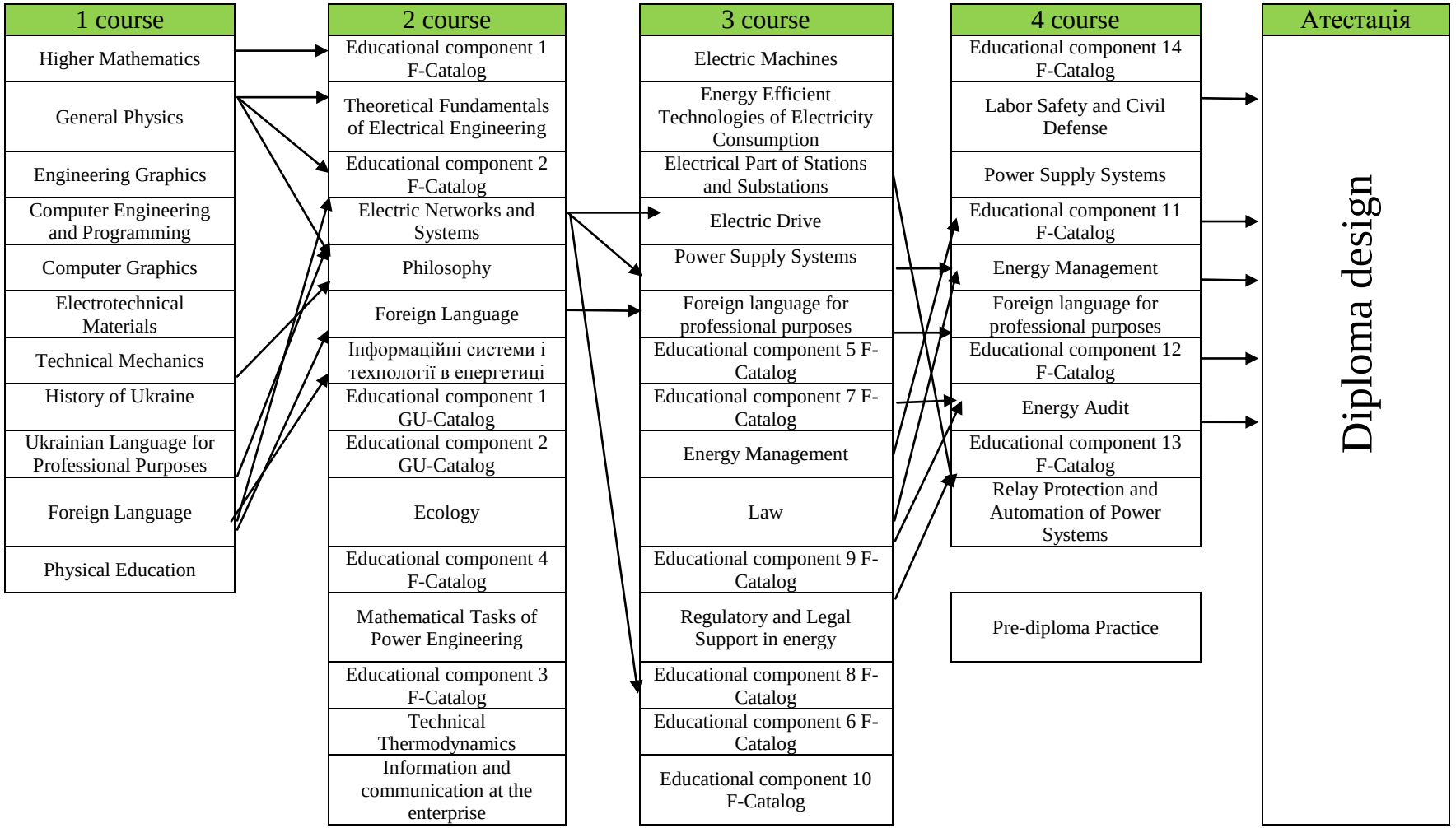
	1187 (as amended by the Cabinet of Ministers of Ukraine dated 10 May 2018 № 347)
Technical support	In accordance with the technological requirements for material and technical support of educational activities of the relevant level of HE (Annex 4 to the License Conditions) approved by the Resolution of the Cabinet of Ministers of Ukraine dated 30.12.2015 №1187 (as amended by the Cabinet of Ministers of Ukraine dated 10 May 2018 № 347). Use of equipment: training rooms with multimedia projectors, computer equipment with appropriate software, laboratory equipment for educational (teaching, research, scientific) activities.
Information, educational and methodical support	In accordance with the technological requirements for educational, methodological and informational support of educational activities of the relevant level of HE (Annex 5 to the Licensing Conditions), approved by the Resolution of the Cabinet of Ministers of Ukraine dated 30.12.2015 №1187 (as amended by the Cabinet of Ministers of Ukraine dated May 10, 2018). № 347). Use of the Scientific and Technical Library of the Igor Sikorsky Kyiv Polytechnic Institute.
9 – Academic mobility	
National credit mobility	Possibility to conclude agreements on academic mobility, double graduation, etc.
International credit mobility	Possibility of concluding agreements on international academic mobility (Erasmus + K1), on double diplomas, on long-term international projects that include inclusive student education, etc.
Training of foreign applicants for higher education	Teaching in English

2. LIST OF COMPONENTS OF THE EDUCATIONAL PROGRAM

Code	Components of the educational program (academic disciplines, practices, term papers, term projects, qualification work)	Number of credits	Form of final control
1	2	3	4
Mandatory (regulatory) components of EP			
General training cycle			
GM 1	Ukrainian Language for Professional Purposes	2	credit
GM 2	History of Science and Technology	2	credit
GM 3	Fundamentals of a Healthy Lifestyle	3	credit
GM 4	Foreign Language	6	credit
GM 5	Labour Safety and Civil Defence	4	credit
GM 6	Law	2	credit
GM 7	Introduction to Philosophy	2	credit
GM 8	Industrial Ecology	2	credit
GM 9	Foreign Language for Specific Purposes	6	examination
GM 10	Higher Mathematics	15	examination
GM 11	General Physics	11	examination
GM 12	Computer Engineering and Programming	9,5	examination
GM 13	Engineering Graphics	4	credit
GM 14	Technical Mechanics	4	credit
GM 15	Computer Graphics	3,5	credit
GM 16	Electrotechnical Materials	3	credit
GM 17	Theoretical Fundamentals of Electrical Engineering	10	examination
GM 18	Electric Machines	5	examination
GM 19	Electrical Equipment of Electric Power Stations and Substations	4	examination
GM 20	Electric Drive	3	examination
GM 21	Electric Systems and Electrical Networks	5	examination
GM 22	Relay Protection and Power System Automation	3,5	examination
Cycle of professional training			
PM 1	Power Supply Systems.	11,5	examination
PM 2	Coursework on Power Supply Systems.	1,5	credit
PM 3	Technical Thermodynamics	5	examination
PM 4	Information systems and technologies in energy	5,5	examination
PM 5	Mathematical Tasks of Power Engineering	4,5	examination
PM 6	Information and Communications at Enterprise	3	credit

1	2	3	4
PM 7	Energy Efficient Technologies of Electricity Distribution	5	examination
PM 8	Energy Efficient Technologies of Power Consumers. (Coursework)	1	credit
PM 9	Energy Management	11,5	examination
PM 10	Regulatory and Legal Support in energy	2	credit
PM 11	Energy Audit	6,5	examination
PM 12	Course Project on Energy Audit	1,5	credit
PM 13	Pre-diploma Practice	6	credit
PM 14	Diploma Design	6	protection
Selective components of EP			
General training cycle (from the general university Catalog)			
GS 1	Educational component 1 GU-Catalog	2	credit
GS 2	Educational component 2 GU-Catalog	2	credit
Cycle of professional training (from the faculty Catalog)			
PS 1	Educational component 1 F-Catalog	4	credit
PS 2	Educational component 2 F-Catalog	4	credit
PS 3	Educational component 3 F-Catalog	4	credit
PS 4	Educational component 4 F-Catalog	4	credit
PS 5	Educational component 5 F-Catalog	4	credit
PS 6	Educational component 6 F-Catalog	4	credit
PS 7	Educational component 7 F-Catalog	4	credit
PS 8	Educational component 8 F-Catalog	4	credit
PS 9	Educational component 9 F-Catalog	4	credit
PS 10	Educational component 10 F-Catalog	4	credit
PS 11	Educational component 11 F-Catalog	4	credit
PS 12	Educational component 12 F-Catalog	4	credit
PS 13	Educational component 13 F-Catalog	4	credit
PS 14	Educational component 14 F-Catalog	4	credit
The total amount of **mandatory components**:		180	
The total amount of **selective components**:		60	
The amount of **educational components that provide the acquisition competencies defined by the HES**		180	
TOTAL VOLUME OF THE EDUCATIONAL PROGRAM		**240**	

3. STRUCTURAL LOGICAL SCHEME OF THE EDUCATIONAL PROGRAM



4. FORM OF CERTIFICATION OF APPLICANTS FOR HIGHER EDUCATION

Certification of higher education applicants under the educational program "Energy management and energy efficient technologies" specialty 141 "Electrical Power Engineering, Electrical Engineering and Electromechanics" is carried out in the form of defense (demonstration) of qualification work and ends with the issuance of a standard document to award its author with a bachelor's degree in “Electrical Power Engineering, Electrical Engineering and Electromechanics” according to the educational-professional program "Energy management and energy efficient technologies ".

Qualification work is checked for plagiarism, fabrication and falsification and after protection is placed in the repository of NTL of the University for free access.

Certification is carried out openly and publicly.

5. MATRIX OF COMPLIANCE OF SOFTWARE COMPETENCIES WITH COMPONENTS OF THE EDUCATIONAL PROGRAM

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6. MATRIX OF PROVIDING PROGRAM RESULTS OF STUDY BY THE RELEVANT COMPONENTS OF THE EDUCATIONAL PROGRAM

	GM 1	GM 2	GM 3	GM 4	GM 5	GM 6	GM 7	GM 8	GM 9	GM 10	GM 11	GM 12	GM 13	GM 14	GM 15	GM 16	GM 17	GM 18	GM 19	GM 20	GM 21	GM 22	PM 1	PM 2	PM 3	PM 4	PM 5	PM 6	PM 7	PM 8	PM 9	PM 10	PM 11	PM 12	PM 13	PM 14
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	GM 1	GM 2	GM 3	GM 4	GM 5	GM 6	GM 7	GM 8	GM 9	GM 10	GM 11	GM 12	GM 13	GM 14	GM 15	GM 16	GM 17	GM 18	GM 19	GM 20	GM 21	GM 22	PM 1	PM 2	PM 3	PM 4	PM 5	PM 6	PM 7	PM 8	PM 9	PM 10	PM 11	PM 12	PM 13	PM 14
PR29																											+				+		+	+		
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