



MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL TECHNICAL UNIVERSITY "KHARKIV POLYTECHNIC INSTITUTE"

CURRICULUM

educational and professional program

Electrical Power Engineering

in the field of
knowledge

14 Electrical engineering

(Knowledge field code and title)

APPROVED BY

Rector of NTU "KhPI"

for the training first (bachelor`s) level
(higher education level)

Yevgen SOKOL by specialty

- 141 Electric Power Engineering, Electrical Engineering and Electromechanics

Qualification

The Bachelor of Electric Power Engineering, Electrical

Period of study **3 years 10 months**

on the basis of complete secondary education

"2" June 2023 p.

Form of study **full-time**

I. Schedule of education process

Курс	September				October				November					December					January					February				March				April				May				June				July				August					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	
I																	T	V	E	E	E	V																	T	E	E	E	V	V	V	V	V	V	V	V	V	V	
II																	T	V	E	E	E	V																	T	E	E	E	V	V	V	V	V	V	V	V	V	V	
III																	T	V	E	E	E	V															T	E	E	E	P	P	P	P	V	V	V	V	V	V	V	V	V
IV																	T	V	E	E	E	V														E	E	P	P	P	P	Q	Q	D	D								

Legend: Theoretical study E Exam Session P Practice Q Preparation of qualification work T Test week V Vacation D Defending of qualification work

II. Consolidated budget time (in weeks)

Course	Theoretical study	Exam Session	Practice	Attestation	Preparation of qualification work	Vacation	Total
I	32	8				12	52
II	32	8				12	52
III	28	8	4			12	52
IV	26	6	4	2	2	2	42
total	118	30	8	2	2	38	198

III. Practice

Type of practice	Duration (in weeks)	Semester
Practical	4	6
Pre-graduation	4	8

IV. Attestation

Measures	Number of ECTS credits	Semester
Preparation of qualification work	3,0	8
Defending of qualification work	3,0	8
Proficiency examination		

V. EDUCATION PROCESS PLAN

Code in accordance with the EPF	Name of academic discipline	Semester distribution			Number of ECTS credits	Number of hours						Distribution of classroom hours per a week and ECTS credits per a semester														Department			
		Exams	Tests	Individual tasks		Total amount	Classroom	Independent work	I course		II course		III course		IV course		Semesters												
									1	2	3	4	5	6	7	8	20		20		20		20						
		Number of weeks in the semester																											
		20		20			20		20		20		20		20		20		20										
		Classroom hours	ECTS credits	Classroom hours			ECTS credits		Classroom hours	ECTS credits	Classroom hours	ECTS credits	Classroom hours	ECTS credits	Classroom hours	ECTS credits	Classroom hours	ECTS credits	Classroom hours	ECTS credits	Classroom hours	ECTS credits							
		13	14	15		16	17	18	19	20	21	22	23	24	25	26	27	28	29										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1	Obligatory educational components				147,0	4410,0	1994,0	854,0	278,0	862,0	2416,0	22,0	27,0	21,0	24,0	22,0	26,0	21,0	24,0	14,0	16,0	11,0	10,0	12,0	14,0	7,0	6,0		
1.1	General training				79,0	2370,0	1068,0	320,0	80,0	668,0	1302,0	19,0	23,0	17,0	20,0	13,0	15,0	9,0	10,0	4,0	5,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	
GT 1	History and Culture of Ukraine	1		R	4,0	120,0	48,0	16,0		32,0	72,0	3,0	4,0																310
GT 2	Philosophy	4		R	3,0	90,0	32,0	16,0		16,0	58,0						2,0	3,0											307
GT 3	Jurisprudence		3	R	3,0	90,0	32,0	16,0		16,0	58,0				2,0	3,0													306
GT 4	History of Science and Technology		5	R	3,0	90,0	32,0	16,0		16,0	58,0								2,0	3,0									310
GT 5	English Language for professional purposes		3,4,5,6, 7,8	R	12,0	360,0	172,0			172,0	188,0				2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	275
GT 6	Language for Professional Training	2	1	R	7,0	210,0	96,0			96,0	114,0	2,0	2,0	4,0	5,0														275
GT 7	Ukrainian as a Foreign Language	4	1,2,3	R	8,0	240,0	128,0			128,0	112,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0											273
GT 8	Ecology		2	R	3,0	90,0	32,0	16,0	16,0		58,0				2,0	3,0													144
GT 9	Chemistry		1	C	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0																192
GT 10	Higher Mathematics p.1	1		C	6,0	180,0	80,0	48,0		32,0	100,0	5,0	6,0																170
GT 10	Higher Mathematics p.2	2		C	6,0	180,0	80,0	32,0		48,0	100,0			5,0	6,0														170
GT 10	Higher Mathematics p.3	3		C	4,0	120,0	48,0	16,0		32,0	72,0				3,0	4,0													170
GT 10	Higher Mathematics p.4	4		C	3,0	90,0	48,0	16,0		32,0	42,0						3,0	3,0											170
GT 11	Physics p.1	1		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0	4,0	5,0																168
GT 11	Physics p.2	2		C	4,0	120,0	64,0	32,0	16,0	16,0	56,0			4,0	4,0														168
GT 11	Physics p.3	3		C	4,0	120,0	64,0	32,0	16,0	16,0	56,0			4,0	4,0														168
1.2	Professional training				68,0	2040,0	926,0	534,0	198,0	194,0	1114,0	3,0	4,0	4,0	4,0	9,0	11,0	12,0	14,0	10,0	11,0	9,0	8,0	10,0	12,0	5,0	4,0		
PT 1	Descriptive Geometry, Engineering and Computer Graphics	1		CG	4,0	120,0	48,0	16,0		32,0	72,0	3,0	4,0																163
PT 2	Electrotechnical Materials	2		R	4,0	120,0	64,0	32,0	32,0		56,0			4,0	4,0														133
PT 3	Fundamentals of Metrology and Electrical Measurements	3		C	5,0	150,0	64,0	32,0	32,0		86,0				4,0	5,0													173
PT 4	Theoretical Foundations of Electrical Engineering p.1	3		C	6,0	180,0	80,0	48,0	16,0	16,0	100,0				5,0	6,0													137
PT 5	Theoretical Foundations of Electrical Engineering p.2	4		C	5,0	150,0	80,0	32,0	16,0	32,0	70,0						5,0	5,0											137
PT 6	Fundamentals of Electronics	4		C	5,0	150,0	64,0	48,0	16,0		86,0						4,0	5,0											128
PT 7	Technical Mechanics		4	CG	4,0	120,0	48,0	32,0		16,0	72,0						3,0	4,0											148
PT 8	Electric Machines	5		C	6,0	180,0	80,0	48,0	16,0	16,0	100,0									5,0	6,0								126
PT 9	Electrical Systems and Networks	5		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0									5,0	5,0								131
PT 10	Fundamentals of Professional and Personal Safety	6		R	3,0	90,0	36,0	24,0		12,0	54,0											3,0	3,0						144
PT 11	Electrical Part Of Power Stations And Substations	6		C	5,0	150,0	72,0	48,0	12,0	12,0	78,0											6,0	5,0						130
PT 12	Enterprise Economics		7	C	3,0	90,0	32,0	16,0		16,0	58,0													2,0	3,0			202	
PT 13	Fundamentals of Relay Protection and Automation of Power	7		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0														5,0	5,0		132	
PT 14	High Voltage Equipment	7		C	4,0	120,0	48,0	32,0	16,0		72,0												3,0	4,0				120	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
OP4.3	Calculation and Design of Insulation Construction	5		CW	5,0	150,0	72,0	48,0	12,0	12,0	78,0											6,0	6,0						133
OP4.4	Cable Technique Part 1	6		CP	5,0	150,0	64,0	32,0		32,0	86,0													4,0	5,0				133
OP4.5	Cable Technique Part 2	7		CP	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		133
OP4.6	Optical Fiber Technique and Communication Cables	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		133
OP4.7	Installation, Operation and Diagnostics of Cable Systems	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		133
4.1.5	Profiled discipline package 05 "Energy Management and Energy-Efficient Technologies"				30,0	900,0	414,0	234,0	48,0	132,0	486,0	3,0	3,0								5,0	5,0	6,0	6,0	4,0	5,0	15,0	12,0	
OP5.1	Introduction to Speciality. Introductory Practical Training	1		R	3,0	90,0	48,0	16,0		32,0	42,0	3,0	3,0																130
OP5.2	Mathematical Problems Of Power Engineering	5		CW	5,0	150,0	80,0	48,0		32,0	70,0									5,0	5,0								130
OP5.3	Transients in Power Systems	6		CW	5,0	150,0	72,0	48,0	12,0	12,0	78,0											6,0	6,0						130
OP5.4	Fundamentals of Power Supply Systems	7		CW	5,0	150,0	64,0	32,0	16,0	16,0	86,0													4,0	5,0				130
OP5.5	Fundamentals of Energy Audit	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		130
OP5.6	Accounting and Management of Power Consumption	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		130
OP5.7	Economic Assessment of Energy Saving Problems		8	C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		130
4.1.6	Profiled discipline package 06 "Renewable sources of energy and technique and electrophysics of high voltages"				30,0	900,0	414,0	234,0	16,0	164,0	486,0	3,0	3,0								5,0	5,0	6,0	6,0	4,0	5,0	15,0	12,0	
OP6.1	Introduction to Speciality. Introductory Practical Training	1		R	3,0	90,0	48,0	16,0		32,0	42,0	3,0	3,0																135
OP6.2	Application of Solar Energy	5		CW	5,0	150,0	80,0	48,0		32,0	70,0									5,0	5,0								135
OP6.3	Power Storage	6		CW	5,0	150,0	72,0	48,0		24,0	78,0											6,0	6,0						135
OP6.4	Power Equipment of Renewable Energy Installations	7		CW	5,0	150,0	64,0	32,0	16,0	16,0	86,0													4,0	5,0				135
OP6.5	Fundamentals of High Voltage Pulse Installations Designing	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		135
OP6.6	Electrophysical Technological Installations	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		135
OP6.7	Bio Power Engineering Complexes		8	C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		135
4.1.7	Profiled discipline package 07 "Cybersecurity Technologies in Electric Power Engineering"				30,0	900,0	414,0	222,0	12,0	180,0	486,0	3,0	3,0								5,0	5,0	6,0	6,0	4,0	5,0	15,0	12,0	
OP7.1	Introduction to Speciality. Introductory Practical Training	1		R	3,0	90,0	48,0	16,0		32,0	42,0	3,0	3,0																132
OP7.2	Operation System Security	5		CW	5,0	150,0	80,0	48,0		32,0	70,0									5,0	5,0								132
OP7.3	Electromagnetic Transient Processes	6		CW	5,0	150,0	72,0	36,0	12,0	24,0	78,0											6,0	6,0						132
OP7.4	Computer Networks Security	7		CW	5,0	150,0	64,0	32,0		32,0	86,0													4,0	5,0				132
OP7.5	Automatization of Power Engineering Systems	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		132
OP7.6	Fundamentals of Power Supply and Energy Saving	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		132
OP7.7	Electricity Accounting and Quality Control Systems		8	R	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		132
4.1.8	Profiled discipline package 08 "Digital energy"				30,0	900,0	414,0	222,0	38,0	154,0	486,0	3,0	3,0								5,0	5,0	6,0	6,0	4,0	5,0	15,0	12,0	
OP8.1	Introduction to Speciality. Introductory Practical Training	1		R	3,0	90,0	48,0	16,0		32,0	42,0	3,0	3,0																131
OP8.2	Fundamentals of Mathematical Modeling of Electrical Systems and Networks	5		CW	5,0	150,0	80,0	48,0		32,0	70,0									5,0	5,0								324
OP8.3	Design of Electrical Systems and Networks	6		CP	5,0	150,0	72,0	36,0	12,0	24,0	78,0											6,0	6,0						131

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
OP8.4	Backbone Grids and Their Modes	7		CP	5,0	150,0	64,0	32,0	16,0	16,0	86,0													4,0	5,0			131
OP8.5	Expert Systems for Protection and Control of Electrical Networks	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	351
OP8.6	Digitization of Electricity Distribution and Consumption Processes		8	C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	131
OP8.7	Digital Substations	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	131
4.2	Optional student disciplines of the profile preparation according to the list				33,0	990,0	440,0	240,0	92,0	124,0	550,0			5,0	6,0	3,0	4,0	5,0	6,0	4,0	5,0	6,0	5,0	6,0	7,0			120
4.3	Optional student disciplines from the general university catalog of disciplines				12,0	360,0	132,0	88,0		44,0	228,0									3,0	4,0	3,0	4,0	3,0	4,0			
ВД1	Discipline 1		5		4,0	120,0	48,0	32,0		16,0	72,0								3,0	4,0								
ВД2	Discipline 2		6		4,0	120,0	36,0	24,0		12,0	84,0										3,0	4,0						
ВД3	Discipline 3		7		4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			
	Total for education period				240,0	7200,0	2980,0				4220,0	25,0	30,0	26,0	30,0	25,0	30,0	26,0	30,0	26,0	30,0	26,0	31,0	25,0	30,0	22,0	30,0	
	Hours per week												25,0	26,0	25,0	26,0	26,0	26,0	26,0	25,0	22,0							
	Number of exams											5	5	4	4	4	4	4	4	3								3
	Number of tests											2	2	3	3	3	3	3	3	3								2
	Number of course projects (works)												1		1	1	1	1	1									
	Numbers of disciplines per semester											7	8	7	7	8	8	8	8									5

Individual tasks	
C	Calculated task
CG	Calculated and graphic task
R	Report
CP	Course project
CW	Course work

Approved by the Academic Council of NTU "KhPI"
 PROTOCOL № 5 from 02.06.2023

Vice-rector of Scientific-and-Pedagogical Work

Gennadyi KHRYPUNOV

Head of the educational program
 Electrical Power Engineering

Halyna OMELIANENKO

Head of the Institute of Education and Science
 in Power Engineering, Electronics and
 Electromechanics

name of the Institute

Roman TOMASHEVSKYI

Head of the Department of Automation
 and Cybersecurity of Power Systems

name of department

Dmytro HAPON

Head of the Department of Power Stations

name of department

Oleksandr LAZURENKO

Head of the Department of Electrical

name of department

Oleksandr KIESSAIEV

transmission

name of department

Sergyi SHEVCHENKO

Head of the Department Engineering

name of department

Sergyi MOSTOVYI

* Практики та атестацію проводять випускові кафедри

List of optional student disciplines of the profile training

Code in accordance with the EPT	Name of academic discipline	Semester distribution			Number of ECTS credits	Number of hours						Distribution of classroom hours per a week and ECTS credits per a semester												Department				
		Exams	Tests	Individual tasks		Total amount	Classroom				Independent work	I course		II course		III course		IV course										
							Total	including				1	2	3	4	5	6	7	8									
		Lectures	Laboratory works	Practical studies		Semesters																						
		Number of weeks in the semester														20	20	20	20	20	20	20	20					
		Classroom m hours	ECTS credits	Classroom m hours		ECTS credits	Classroom m hours	ECTS credits	Classroom m hours	ECTS credits	Classroom m hours	ECTS credits	Classroom m hours	ECTS credits	Classroom m hours										ECTS credits			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
2.2	Optional student disciplines of the profile training																											
OPT1	Fundamentals of information technology in electric power industry	2		CW	6,0	180,0	80,0	32,0	32,0	16,0	100,0			5,0	6,0													130
OPT2	Fundamentals of information technology in electric power systems	2		CW	6,0	180,0	80,0	32,0	32,0	16,0	100,0			5,0	6,0													131
OPT3	Fundamentals of information technology in management systems	2		CW	6,0	180,0	80,0	32,0	32,0	16,0	100,0			5,0	6,0													132
OPT4	Applied Programming in Electrical Insulation and Cable Technique	2		CW	6,0	180,0	80,0	32,0	32,0	16,0	100,0			5,0	6,0													133
OPT5	Fundamentals of Information Technology in High Voltage Equipment and Renewable Power Engineering	2		CW	6,0	180,0	80,0	32,0	32,0	16,0	100,0			5,0	6,0													135
OPT6	Automatic control theory in problems of Electricity and Energy Efficiency	3		C	4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0											130
OPT7	Theory of automatic control in problems of electric power systems	3		C	4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0											131
OPT8	Automatic control theory in problems of control and protection of power systems	3		C	4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0											132
OPT9	Chemistry of dielectrics		3	R	4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0											193
OPT10	Fundamentals of computer design and modeling of renewable Power systems		3	C	4,0	120,0	48,0	32,0		16,0	72,0					3,0	4,0											135
OPT11	Mathematical bases of IT technologies in electric power industry	3		C	4,0	120,0	48,0	32,0		16,0	72,0					3,0	4,0											324
OPT12	Fundamentals Of Electric Power Industry	4		CW	6,0	180,0	80,0	32,0	16,0	32,0	100,0							5,0	6,0									130
OPT13	Physical Processes in Electric Power Engineering Systems	4		CW	6,0	180,0	80,0	32,0	16,0	32,0	100,0							5,0	6,0									132
OPT14	Physics of dielectrics	4		CW	6,0	180,0	80,0	32,0	16,0	32,0	100,0							5,0	6,0									133
OPT15	Fundamentals of electrophysical technologies	4		CW	6,0	180,0	80,0	32,0	16,0	32,0	100,0							5,0	6,0									135
OPT16	Distribution electric networks	4		CP	6,0	180,0	80,0	32,0	16,0	32,0	100,0							5,0	6,0									131
OPT17	Theory of Electric and Magnetic Field	5		C	5,0	150,0	64,0	32,0		32,0	86,0									4,0	5,0							137
OPT18	Theoretical Fundamentals of Heat Engineering	5		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0									4,0	5,0							123
OPT19	Theory of Electromagnetic Fields in Electrical Insulation,Cable and Optical Fiber Technique	5		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0									4,0	5,0							133
OPT20	Theory of Electric and Magnetic Fields in Electrophysical and Power Devices	5		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0									4,0	5,0							135
OPT21	Cloud technologies in the power industry	5		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0									4,0	5,0							351
OPT22	Fundamentals of energy management	6		C	5,0	150,0	72,0	48,0	12,0	12,0	78,0											6,0	5,0					130
OPT23	Energy efficient electric drive	6		C	5,0	150,0	72,0	48,0		24,0	78,0											6,0	5,0					129
OPT24	Electromagnetic Transient Processes	6		C	5,0	150,0	72,0	48,0	12,0	12,0	78,0											6,0	5,0					131
OPT25	Mathematical Problems Of Power Engineering	6		C	5,0	150,0	72,0	48,0		24,0	78,0											6,0	5,0					132

OPT26	Mathematical Modelling in Electrical Insulation, Cable and Optical Fiber Technique	6	C	5,0	150,0	72,0	36,0	12,0	24,0	78,0													6,0	5,0							133	E-123i.e
OPT27	High Voltage Pulse Equipment	6	C	5,0	150,0	72,0	48,0	12,0	12,0	78,0													6,0	5,0							135	E-123i.e
OPT28	Microprocessor technology	7	R	3,0	90,0	48,0	32,0	16,0		42,0															3,0	3,0					130	E-123i.e
OPT29	Microprocessor technology	7	R	3,0	90,0	48,0	32,0	16,0		42,0															3,0	3,0					132	E-123i.e
OPT30	Electromagnetic compatibility	7	C	3,0	90,0	48,0	32,0		16,0	42,0															3,0	3,0					135	E-123i.e
OPT31	Digital systems for protection and control of electrical grids	7	C	3,0	90,0	48,0	32,0		16,0	42,0															3,0	3,0					132	E-123i.e
OPT32	Technological facilities for the production of power and optical cables	7	C	3,0	90,0	48,0	32,0		16,0	42,0															3,0	3,0					133	E-123i.e
OPT33	Electromechanical transient processes and dynamic stability	7	C	4,0	120,0	48,0	32,0		16,0	72,0															3,0	4,0					130	E-123i.e
OPT34	Electromechanical transient processes in electric power systems	7	C	4,0	120,0	48,0	32,0		16,0	72,0															3,0	4,0					131	E-123i.e
OPT35	Electromechanical transient processes	7	C	4,0	120,0	48,0	32,0		16,0	72,0															3,0	4,0					132	E-123i.e
OPT36	Fundamentals of Fiber Optical Technique and Communication Cables	7	C	4,0	120,0	48,0	32,0		16,0	72,0															3,0	4,0					133	E-123i.e
OPT37	Energy Management	7	C	4,0	120,0	48,0	32,0		16,0	72,0															3,0	4,0					130	E-123i.e
OPT38	High voltage measurements	7	C	4,0	120,0	48,0	32,0	16,0		72,0															3,0	4,0					135	E-123i.e

CONTENT of CURRICULUM

for the training of the first (bachelor) level:
by specialty

141

Electric Power Engineering,
Electrical Engineering and
Electromechanics

Number in order	Discipline title	Total amount				Departme nt code
		ECTS credits	Hours	Semester		
1	2	3	4	5	6	7
1	Obligatory educational components	147,0	4410,0			61,25%
1.1	General training	79,0	2370,0			54%
GT 1	History and Culture of Ukraine	4,0	120,0	1		310
GT 2	Philosophy	3,0	90,0	4		307
GT 3	Jurisprudence	3,0	90,0		3	306
GT 4	History of Science and Technology	3,0	90,0		5	310
GT 5	English Language for professional purposes	12,0	360,0		3,4,5,6,7,8	275
GT 6	Language for Professional Training	7,0	210,0	2	1	275
GT 7	Ukrainian as a Foreign Language	8,0	240,0	4	1,2,3	273
GT 8	Ecology	3,0	90,0		2	144
GT 9	Chemistry	4,0	120,0		1	192
GT 10	Higher Mathematics p.1	6,0	180,0	1		170
GT 10	Higher Mathematics p.2	6,0	180,0	2		170
GT 10	Higher Mathematics p.3	4,0	120,0	3		170
GT 10	Higher Mathematics p.4	3,0	90,0	4		170
GT 11	Physics p.1	5,0	150,0	1		168
GT 11	Physics p.2	4,0	120,0	2		168
GT 11	Physics p.3	4,0	120,0	3		168
1.2	Professional training	68,0	2040,0			46%
PT 1	Descriptive Geometry, Engineering and Computer Graphics	4,0	120,0	1		163
PT 2	Electrotechnical Materials	4,0	120,0	2		133
PT 3	Fundamentals of Metrology and Electrical Measurements	5,0	150,0	3		173
PT 4	Theoretical Foundations of Electrical Engineering p.1	6,0	180,0	3		137
PT 5	Theoretical Foundations of Electrical Engineering p.2	5,0	150,0	4		137
PT 6	Fundamentals of Electronics	5,0	150,0	4		128
PT 7	Technical Mechanics	4,0	120,0		4	148
PT 8	Electric Machines	6,0	180,0	5		126
PT 9	Electrical Systems and Networks	5,0	150,0	5		131
PT 10	Fundamentals of Professional and Personal Safety	3,0	90,0	6		144
PT 11	Electrical Part Of Power Stations And Substations	5,0	150,0	6		130
PT 12	Enterprise Economics	3,0	90,0		7	202
PT 13	Fundamentals of Relay Protection and Automation of Power	5,0	150,0	7		132
PT 14	High Voltage Equipment	4,0	120,0	7		120
PT 15	Renewable Energy Sources and Power Facilities	4,0	120,0	8		135
2	Practical Preparation	12,0	360,0			5,00%
PP1	Practical Training*	6,0	180,0			120
PP2	Pre-graduation Practice*	6,0	180,0			120
3	Attestation*	6,0	180,0			2,50%
4	Optional educational components	75,0	2250,0			31,25%
4.1	Profile training	30,0	900,0			40%
4.1.1	Profiled discipline package 01 "Electric Power Stations"	30,0	900,0			
OP1.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		130
OP1.2	Mathematical Problems of Power Engineering	5,0	150,0	5		130
OP1.3	Electromagnetic Transient Processes	5,0	150,0	6		130
OP1.4	Design of Electrical Part of Stations And Substations	5,0	150,0	7		130
OP1.5	Modernization of Electrical Part of Stations And Substations	4,0	120,0	8		130
OP1.6	Power Supply Systems	4,0	120,0	8		130
OP1.7	Automatization of Electric Power Stations	4,0	120,0		8	130
4.1.2	Profiled discipline package 02 "Electrical systems and networks"	30,0	900,0			
OP2.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		131
OP2.2	Mathematical Problems of Power Engineering	5,0	150,0	5		131
OP2.3	Design of Electrical Systems and Networks	5,0	150,0	6		131
OP2.4	Backbone Grids and their Modes	5,0	150,0	7		131
OP2.5	Mode Optimization of Electric Power Systems	4,0	120,0		8	131
OP2.6	Electrical Installation Grounding Devices	4,0	120,0	8		131
OP2.7	Overvoltage in Electric Power Systems	4,0	120,0	8		131
4.1.3	Profiled discipline package 03 "Systems of control of production and distribution of electric power"	30,0	900,0			
OP3.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		132
OP3.2	Elements of Automation Systems	5,0	150,0	5		132
OP3.3	Electromagnetic Transient Processes	5,0	150,0	6		132
OP3.4	Design of Relay Protection of Power Systems	5,0	150,0	7		132
OP3.5	Automatization of Power Engineering Systems	4,0	120,0	8		132
OP3.6	Fundamentals of Power Supply and Energy Saving	4,0	120,0	8		132
OP3.7	Electricity Accounting and Quality Control Systems	4,0	120,0		8	132
4.1.4	Profiled discipline package 04 "Electrical Insulation, Cable and Optical Fiber Equipment"	30,0	900,0			
OP4.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		133
OP4.2	Fundamentals of Electrical Insulation Technique	5,0	150,0	1		133
OP4.3	Calculation and Design of Insulation Construction	5,0	150,0	5		133
OP4.4	Cable Technique Part 1	5,0	150,0	6		133
OP4.5	Cable Technique Part 2	4,0	120,0	7		133
OP4.6	Optical Fiber Technique and Communication Cables	4,0	120,0	8		133
OP4.7	Installation, Operation and Diagnostics of Cable Systems	4,0	120,0	8		133
4.1.5	Profiled discipline package 05 "Energy Management and Energy-Efficient Technologies"	30,0	900,0			
OP5.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		130
OP5.2	Mathematical Problems Of Power Engineering	5,0	150,0	5		130
OP5.3	Transients in Power Systems	5,0	150,0	6		130
OP5.4	Fundamentals of Power Supply Systems	5,0	150,0	7		130
OP5.5	Fundamentals of Energy Audit	4,0	120,0	8		130
OP5.6	Accounting and Management of Power Consumption	4,0	120,0	8		130
OP5.7	Economic Assessment of Energy Saving Problems	4,0	120,0		8	130
4.1.6	Profiled discipline package 06 "Renewable sources of energy and technique and electrophysics of high voltages"	30,0	900,0			
OP6.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		135
OP6.2	Application of Solar Energy	5,0	150,0	5		135
OP6.3	Power Storage	5,0	150,0	6		135
OP6.4	Power Equipment of Renewable Energy Installations	5,0	150,0	7		135
OP6.5	Fundamentals of High Voltage Pulse Installations Designing	4,0	120,0	8		135
OP6.6	Electrophysical Technological Installations	4,0	120,0	8		135
OP6.7	Bio Power Engineering Complexes	4,0	120,0		8	135
4.1.7	Profiled discipline package 07 "Cybersecurity Technologies in Electric Power Engineering"	30,0	900,0			
OP7.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		132
OP7.2	Operation System Security	5,0	150,0	5		132
OP7.3	Electromagnetic Transient Processes	5,0	150,0	6		132
OP7.4	Computer Networks Security	5,0	150,0	7		132
OP7.5	Automatization of Power Engineering Systems	4,0	120,0	8		132
OP7.6	Fundamentals of Power Supply and Energy Saving	4,0	120,0	8		132
OP7.7	Electricity Accounting and Quality Control Systems	4,0	120,0		8	132
4.1.8	Profiled discipline package 08 "Digital energy"	30,0	900,0			
OP8.1	Introduction to Specialty. Introductory Practical Training	3,0	90,0	1		131
OP8.2	Fundamentals of Mathematical Modeling of Electrical Systems and Networks	5,0	150,0	5		324
OP8.3	Design of Electrical Systems and Networks	5,0	150,0	6		131
OP8.4	Backbone Grids and Their Modes	5,0	150,0	7		131
OP8.5	Expert Systems for Protection and Control of Electrical Networks	4,0	120,0	8		351
OP8.6	Digitization of Electricity Distribution and Consumption Processes	4,0	120,0		8	131
OP8.7	Digital Substations	4,0	120,0	8		131
4.2	Optional student disciplines of the profile preparation according to the list	33,0	990,0			44%
4.3	Optional student disciplines from the general university catalog of disciplines	12,0	360,0			16%
BD1	Discipline 1	4,0	120,0		5	
BD2	Discipline 2	4,0	120,0		6	
BD3	Discipline 3	4,0	120,0		7	
	Total for education period	240,0	7200,0			