

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						
							Total	including			Semesters																		
		Lectures	Laboratory works	Practical studies		1		2		3		4		5		6		7		8									
						Number of weeks in the semester																							
		20		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	Classroom m hours	ECTS credits	Classroom m hours	ECTS credits												
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29													
1	Obligatory educational components				136,0	4080,0	1796,0	688,0	240,0	868,0	2284,0	28,0	30,0	20,0	21,0	24,0	26,0	22,0	24,0	9,0	11,0	4,0	5,0	4,0	5,0	2,0	14,0		
1.1	General training				76,0	2280,0	1124,0	352,0	112,0	660,0	1156,0	24,0	26,0	16,0	17,0	14,0	15,0	9,0	10,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	
GT 1	Foreign language		3,4,7,8	R	8,0	240,0	116,0			116,0	124,0					2,0	2,0	2,0	2,0					2,0	2,0	2,0	2,0	275	
GT 2	History and Culture of Ukraine	1		R	4,0	120,0	64,0	32,0		32,0	56,0	4,0	4,0															310	
GT 3	The language of vocational training	2	1	R	11,0	330,0	144,0			144,0	186,0	5,0	7,0	4,0	4,0													275	
GT 4	Ukrainian as a foreign language	6	3,4,5	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	2,0					273	
GT 5	Ecology		2	R	3,0	90,0	32,0	16,0	16,0		58,0			2,0	3,0													144	
GT 6	Jurisprudence		3	R	3,0	90,0	32,0	16,0		16,0	58,0					2,0	3,0											306	
GT 7	Philosophy	4		R	3,0	90,0	32,0	16,0		16,0	58,0					2,0	3,0											307	
GT 8	Chemistry	1		C	4,0	120,0	64,0	32,0	32,0		56,0	4,0	4,0															192	
GT 9	Higher Mathematics p.1	1		C	6,0	180,0	96,0	48,0		48,0	84,0	6,0	6,0															170	
GT 10	Higher Mathematics p.2	2		C	6,0	180,0	96,0	48,0		48,0	84,0			6,0	6,0													170	
GT 11	Higher Mathematics p.3	3		C	4,0	120,0	64,0	32,0		32,0	56,0					4,0	4,0											170	
GT 12	Higher Mathematics p.4	4		C	3,0	90,0	48,0	16,0		32,0	42,0						3,0	3,0										170	
GT 13	Physics p.1	1		C	5,0	150,0	80,0	32,0	32,0	16,0	70,0	5,0	5,0															168	
GT 14	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 15	Physics p.3	3		C	4,0	120,0	64,0	32,0	16,0	16,0	56,0					4,0	4,0											168	
GT																													
1.2	Professional training				60,0	1800,0	672,0	336,0	128,0	208,0	1128,0	4,0	4,0	4,0	4,0	10,0	11,0	13,0	14,0	7,0	9,0	2,0	3,0	2,0	3,0		12,0		
PT 1	Descriptive Geometry, Engineering and Computer Graphics	1		CG	4,0	120,0	64,0	16,0		48,0	56,0	4,0	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											357	
PT 4	Theoretical Foundations of Electrical Engineering p.1	3		C	6,0	180,0	96,0	48,0	16,0	32,0	84,0					6,0	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	64,0	32,0		32,0	56,0						4,0	4,0										148	
PT 8	History of Science and Technology		5	R	3,0	90,0	32,0	16,0		16,0	58,0									2,0	3,0							310	
PT 9	Electric Machines	5		C	6,0	180,0	80,0	48,0	16,0	16,0	100,0									5,0	6,0							126	
PT 10	Fundamentals of Professional and Personal Safety	6		R	3,0	90,0	32,0	16,0		16,0	58,0											2,0	3,0					144	
PT 11	Company Economics		7	C	3,0	90,0	32,0	16,0		16,0	58,0													2,0	3,0			202	

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	
PT	Practice*		8		6,0	180,0					180,0																6,0	120	
	Attestation*				6,0	180,0					180,0																6,0	120	
2	Optional educational components				104,0	3120,0	1432,0	360,0	106,0	246,0	1688,0			8,0	9,0	4,0	4,0	6,0	6,0	17,0	19,0	22,0	25,0	20,0	25,0	20,0	16,0		
2.1	Profile training				50,0	1500,0	712,0	360,0	106,0	246,0	788,0			8,0	9,0					5,0	5,0	11,0	11,0	8,0	9,0	20,0	16,0		
2.1.1	Profiled discipline package 01 "Electric Power Stations"				50,0	1500,0	712,0	360,0	106,0	246,0	788,0			8,0	9,0					5,0	5,0	11,0	11,0	8,0	9,0	20,0	16,0		
OP 1.1	Introduction to Speciality		2	R	3,0	90,0	32,0			32,0	58,0			2,0	3,0													130	
OP 1.2	Fundamentals of information technology in electric power industry	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0			6,0	6,0													130	
OP 1.3	Mathematical Problems Of Power Engineering	5		C	5,0	150,0	80,0	48,0		32,0	70,0									5,0	5,0							130	
OP 1.4	Electrical Part Of Stations And Substations p.1	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0					130	
OP 1.5	Electromagnetic Transient Processes	6		CW	6,0	180,0	96,0	48,0	16,0	32,0	84,0											6,0	6,0					130	
OP 1.6	Electromechanical transient processes	7		C	4,0	120,0	64,0	32,0	16,0	16,0	56,0														4,0	4,0		130	
OP 1.7	Electrical Part Of Stations And Substations p.2	7		CP	5,0	150,0	64,0	32,0	16,0	16,0	86,0														4,0	5,0		130	
OP 1.8	Electrical Part Of Stations And Substations p.3	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	130	
OP 1.9	Power Supply Systems	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	130	
OP 1.10	Automatization of Electric Power Stations	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	130	
OP 1.11	Operation and Operating Modes of Electric Equipment of Electric Power Stations		8	R	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	130	
OP 1.20																													
2.1.2	Profiled discipline package 02 "Electrical systems and networks"				50,0	1500,0	728,0	360,0	132,0	236,0	772,0			8,0	9,0				5,0	5,0	6,0	6,0	10,0	10,0	4,0	4,0	20,0	16,0	
OP 2.1	Introduction to Specialty		2	R	3,0	90,0	32,0			32,0	58,0			2,0	3,0														131
OP 2.2	Fundamentals of information technology in electric power systems	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0			6,0	6,0														131
OP 2.3	Electrical Distribution Networks	4		CW	5,0	150,0	80,0	32,0	16,0	32,0	70,0							5,0	5,0									131	
OP 2.4	Electrical Systems and Networks p.1	5		CP	6,0	180,0	96,0	48,0	16,0	32,0	84,0									6,0	6,0							131	
OP 2.5	Electromagnetic Transient Processes	6		CW	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0					131	
OP 2.6	Electrical Systems and Networks p.2	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0					131	
OP 2.7	Backbone Networks and their Modes	7		CP	4,0	120,0	64,0	32,0	16,0	16,0	56,0														4,0	4,0		131	
OP 2.8	Mode Optimization of Electric Power Systems	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	131	
OP 2.9	Electrical installation grounding devices	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	131	
OP 2.10	Impact of Objects Fields of Electric Power Systems on the Environment		8	R	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	131	
OP 2.11	Overvoltage in Electric Power Systems	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	131	
OP 2.20																													
2.1.3	Profiled discipline package 03 "Systems of control of production and distribution of electric power"				50,0	1500,0	712,0	360,0	106,0	246,0	788,0			8,0	9,0						5,0	5,0	11,0	11,0	8,0	9,0	20,0	16,0	
OP 3.1	Introduction to Specialty		2	R	3,0	90,0	32,0			32,0	58,0			2,0	3,0														132
OP 3.2	Fundamentals of information technology in control systems	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0			6,0	6,0														132
OP 3.3	Elements of Automation Systems		5	C	5,0	150,0	80,0	48,0	16,0	16,0	70,0										5,0	5,0							132
OP 3.4	Electromagnetic Transient Processes	6		CW	6,0	180,0	96,0	48,0	16,0	32,0	84,0												6,0	6,0					132

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	
OP 3.5	Fundamentals of Relay Protection of Power Systems	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0					132	
OP 3.6	Fundamentals of Relay Protection Designing of Power Engineering Systems	7		CP	5,0	150,0	64,0	32,0		32,0	86,0													4,0	5,0			132	
OP 3.7	Electromechanical transient processes	7		C	4,0	120,0	64,0	32,0	16,0	16,0	56,0													4,0	4,0			132	
OP 3.8	Automatization of Power Engineering Systems	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	132	
OP 3.9	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	
OP 3.10	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	
OP 3.11	Operation of Relay Protection Devices for Power Engineering Systems		8	R	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	132	
OP 3.20																													
2.1.4	Profiled discipline package 04 "Electrical Insulation, Cable and Optical Fiber Equipment"				50,0	1500,0	728,0	392,0	120,0	216,0	772,0				8,0	9,0						11,0	11,0	5,0	5,0	9,0	9,0	20,0	16,0
OP 4.1	Introduction to Speciality		2	R	3,0	90,0	32,0			32,0	58,0				2,0	3,0													133
OP 4.2	Applied Programming in Electrical Insulation and Cable Technique	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0				6,0	6,0													133
OP 4.3	Theory of Electromagnetic Fields in Electrical Insulation,Cable and Optical Fiber Technique	5		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0						133
OP 4.4	Fundamentals of Electrical Insulation Technique	5		CW	6,0	180,0	96,0	48,0	16,0	32,0	84,0											6,0	6,0						133
OP 4.5	Calculation and Design of Insulation Construction	6		CP	5,0	150,0	80,0	48,0	16,0	16,0	70,0												5,0	5,0					133
OP 4.6	Cable Technique Part 1	7		CP	5,0	150,0	80,0	48,0		32,0	70,0														5,0	5,0		133	
OP 4.7	Fundamentals of Fiber Optical Technique: Communication Cables Part 1	7		C	4,0	120,0	64,0	48,0		16,0	56,0														4,0	4,0		133	
OP 4.8	Cable Technique Part 2	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0																5,0	4,0	133
OP 4.9	Fundamentals of Optical Fiber Technique: Communication Cables Part 2	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0																5,0	4,0	133
OP 4.10	Condenser Technique	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0																5,0	4,0	133
OP 4.11	Installation, Operation and Diagnostics of Cable Systems		8	R	4,0	120,0	50,0	30,0	10,0	10,0	70,0																5,0	4,0	133
OP 4.20																													
2.1.5	Profiled discipline package 05 "Energy Management and Energy-Efficient Technologies"				50,0	1500,0	712,0	360,0	126,0	226,0	788,0				8,0	9,0						5,0	5,0	11,0	11,0	8,0	9,0	20,0	16,0
OP 5.1	Introduction to Speciality		2	R	3,0	90,0	32,0			32,0	58,0				2,0	3,0													130
OP 5.2	Fundamentals of information technology in electric power industry	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0				6,0	6,0													130
OP 5.3	Mathematical Problems Of Power Engineering	5		C	5,0	150,0	80,0	48,0		32,0	70,0											5,0	5,0						130
OP 5.4	Transients in Power Systems	6		CW	6,0	180,0	96,0	48,0	16,0	32,0	84,0												6,0	6,0					130
OP 5.5	Energy Management Part 1	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0												5,0	5,0					130
OP 5.6	Fundamentals of Power Supply Systems	7		CW	4,0	120,0	64,0	32,0	16,0	16,0	56,0														4,0	4,0			130

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				
OP 5.7	Energy Management Part 2	7		P	5,0	150,0	64,0	32,0	16,0	16,0	86,0													4,0	5,0			130				
OP 5.8	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				
OP 5.9	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				
OP 5.10	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				
OP 5.11	Intelligent Management Systems of Power Consumption		8	R	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	130				
OP 5.20																																
2.1.6	Profiled discipline package 6 "Renewable sources of energy and technique and electrophysics of high voltages"				50,0	1500,0	680,0	360,0	106,0	214,0	820,0				8,0	9,0							14,0	15,0	8,0	10,0	20,0	16,0				
OP 6.1	Introduction to Speciality		2	R	3,0	90,0	32,0			32,0	58,0				2,0	3,0													135			
OP 6.2	Fundamentals of Information Technology in High Voltage Equipment and Renewable Power Engineering	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0				6,0	6,0													135			
OP 6.3	Power Storage	6		CW	6,0	180,0	80,0	48,0		32,0	100,0												5,0	6,0					135			
OP 6.4	Electrical Equipment in Renewable Energy Installations	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0												5,0	5,0					135			
OP 6.5	High Voltage Pulse Equipment	6		C	4,0	120,0	64,0	48,0	16,0		56,0												4,0	4,0					135			
OP 6.6	High Voltage Equipment of Stations and Substations	7		CP	5,0	150,0	64,0	32,0	16,0	16,0	86,0														4,0	5,0			135			
OP 6.7	High Voltage Measurements	7		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0														4,0	5,0			135			
OP 6.8	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			
OP 6.9	Wind Power Engineering	8		C	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0		135			
OP 6.10	Electrophysical Technological Installations	8		C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		135			
OP 6.11	Bio Power Engineering complexes		8	C	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0		135			
OP 6.20																																
2.1.7	Profiled discipline package 7 "Cybersecurity Technologies in Electric Power Engineering"				50,0	1500,0	712,0	360,0	90,0	262,0	788,0				8,0	9,0							5,0	5,0	11,0	11,0	8,0	9,0	20,0	16,0		
OP 7.1	Introduction to Speciality		2	R	3,0	90,0	32,0			32,0	58,0				2,0	3,0														132		
OP 7.2	Fundamentals of Information Technology in Cybersecurity	2		CW	6,0	180,0	96,0	32,0	32,0	32,0	84,0				6,0	6,0														132		
OP 7.3	Operation system Security		5	C	5,0	150,0	80,0	48,0		32,0	70,0												5,0	5,0						132		
OP 7.4	Electromagnetic Transient Processes	6		CW	6,0	180,0	96,0	48,0	16,0	32,0	84,0													6,0	6,0					132		
OP 7.5	Fundamentals of Relay Protection of Power Systems	6		C	5,0	150,0	80,0	48,0	16,0	16,0	70,0													5,0	5,0					132		
OP 7.6	Computer Networks Security	7		CW	4,0	120,0	64,0	32,0		32,0	56,0															4,0	4,0			132		
OP 7.7	Electromechanical transient processes	7		C	5,0	150,0	64,0	32,0	16,0	16,0	86,0														4,0	5,0				132		
OP 7.8	Automatization of Power Engineering Systems	8		C	4,0	120,0	50,0	30,0		20,0	70,0																5,0	4,0		132		
OP 7.9	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		
OP 7.10	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		
OP 7.11	Software and Hardware Means of Information Security of Power Engineering Systems		8	R	4,0	120,0	50,0	30,0	10,0	10,0	70,0																5,0	4,0		132		
OP 7.20																																
2.1.8	Profiled discipline package 8 "Digital energy"				50,0	1500,0	728,0	360,0	132,0	236,0	772,0				8,0	9,0							5,0	5,0	6,0	6,0	10,0	10,0	4,0	4,0	20,0	16,0

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
OP 8.1	Introduction to the specialty		2	PE	3,0	90,0	32,0			32,0	58,0			2,0	3,0													131
OP 8.2	Fundamentals of information technology in power systems	2		KP	6,0	180,0	96,0	32,0	32,0	32,0	84,0			6,0	6,0													131
OP 8.3	Distribution electric networks	4		KП	5,0	150,0	80,0	32,0	16,0	32,0	70,0							5,0	5,0								131	
OP 8.4	Electrical systems and networks part 1	5		KП	6,0	180,0	96,0	48,0	16,0	32,0	84,0									6,0	6,0						131	
OP 8.5	Electromagnetic transients	6		KP	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0				131	
OP 8.6	Electrical systems and networks part 2	6		P	5,0	150,0	80,0	48,0	16,0	16,0	70,0											5,0	5,0				131	
OP 8.7	System-forming networks and their modes	7		KП	4,0	120,0	64,0	32,0	16,0	16,0	56,0													4,0	4,0		131	
OP 8.8	Expert systems for protection and control of electrical networks	8		P	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	131
OP 8.9	Digitization of electricity distribution and consumption processes	8		P	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	131
OP 8.10	Interaction of electric power systems with the environment		8	PE	4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	131
OP 8.11	Digital substations	8		P	4,0	120,0	50,0	30,0	10,0	10,0	70,0															5,0	4,0	131
2.2	Optional student disciplines of the profile preparation according to the list				42,0	1260,0	576,0				684,0					4,0	4,0	6,0	6,0	9,0	10,0	8,0	10,0	9,0	12,0			
2.3	Optional student disciplines from the general university catalog of disciplines				12,0	360,0	144,0				216,0									3,0	4,0	3,0	4,0	3,0	4,0			
OD 1	Discipline 1		5		4,0	120,0	48,0				72,0									3,0	4,0							
OD 2	Discipline 2		6		4,0	120,0	48,0				72,0											3,0	4,0					
OD 3	Discipline 3		7		4,0	120,0	48,0				72,0													3,0	4,0			
Total for education period					240,0	7200,0	3228,0				3972,0	28,0	30,0	28,0	30,0	28,0	30,0	28,0	30,0	26,0	30,0	26,0	30,0	24,0	30,0	22,0	30,0	
Hours per week														28,0	28,0	28,0	28,0	26,0	26,0	24,0	22,0							
Number of exams														5	5	5	6	4	5	5	3							
Number of tests														1	2	2	2	3	2	3	2							
Number of course projects (works)															1	1	1	1	1	1	1							
Numbers of disciplines per semester														6	7	7	7	5	5	5	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 № 4 from 03.07.2020.

Vice-rector of Scientific-and-Pedagogical Work

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