E-323i.e

Форма Б1-23 м2

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY "KHARKIV POLYTECHNIC INSTITUTE"

CURRICULUM

educational and professional program

Electric Drive, Mechatronics and Robotics

APPROVED BY

Rector of NTU "KhPI" **Yevgen SOKOL**

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

by specialty - **141** **Electric Power Engineering, Electrical Engineering and Electromechanics**

in the field of knowledge **14 Electrical engineering** (Knowledge field code and title)

Qualification **The Bachelor of Electric Power Engineering, Electrical Engineering and Electromechanics**

Period of study **3 years 10 months**

on the basis of **complete secondary education for foreign students**

2, June 2023

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	#	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	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	2	8				12	22
II	2	8				12	22
III	2	8	4			12	26
IV	1	6	4	2	2	2	17
total	7	30	8	2	2	38	87

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		

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V. EDUCATION PROCESS PLAN

Code in accordance with the EPP	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
							Classroom				Independent work	I course				II course				III course				IV course				
								including				Semesters																
												1		2		3		4		5		6		7		8		
												Number of weeks in the semester																
												20		20		20		20		20		20		20		20		
		Exams	Tests	Individual tasks		Total amount	Total	Lectures	Laboratory works	Practical studies		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	
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**				**152,0**	**4560,0**	**128,0**	**864,0**	**240,0**	**904,0**	**2552,0**	**22,0**	**27,0**	**20,0**	**24,0**	**25,0**	**30,0**	**26,0**	**30,0**	**12,0**	**14,0**	**15,0**	**14,0**	**8,0**	**11,0**	**2,0**	**2,0**	
1.1	**General training**				79,0	2370,0	66,0	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	
GT 1	**History and Culture of Ukraine**	1		R	4,0	120,0	3,0	16,0		32,0	72,0	3,0	4,0															**310**
GT 2	**Philosophy**	4		R	3,0	90,0	2,0	16,0		16,0	58,0							2,0	3,0									**307**
GT 3	**Jurisprudence**		3	R	3,0	90,0	2,0	16,0		16,0	58,0					2,0	3,0											**306**
GT 4	**History of Science and Technology**		5	R	3,0	90,0	2,0	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	10,0			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	**275**
GT 6	**Language for Professional Training**	2	1	R	7,0	210,0	6,0			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	8,0			128,0	112,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0									**273**
GT 8	**Ecology**		2	R	3,0	90,0	2,0	16,0	16,0		58,0			2,0	3,0													**144**
GT 9	**Chemistry**		1	C	4,0	120,0	3,0	32,0	16,0		72,0	3,0	4,0															**192**
GT 10	**Higher Mathematics p.1**	1		C	6,0	180,0	5,0	48,0		32,0	100,0	5,0	6,0															**170**
GT 10	**Higher Mathematics p.2**	2		C	6,0	180,0	5,0	32,0		48,0	100,0			5,0	6,0													**170**
GT 10	**Higher Mathematics p.3**	3		C	4,0	120,0	3,0	16,0		32,0	72,0					3,0	4,0											**170**
GT 10	**Higher Mathematics p.4**	4		C	3,0	90,0	3,0	16,0		32,0	42,0							3,0	3,0									**170**
GT 11	**Physics p.1**	1		C	5,0	150,0	4,0	32,0	16,0	16,0	86,0	4,0	5,0															**168**
GT 11	**Physics p.2**	2		C	4,0	120,0	4,0	32,0	16,0	16,0	56,0			4,0	4,0													**168**
GT 11	**Physics p.3**	3		C	4,0	120,0	4,0	32,0	16,0	16,0	56,0					4,0	4,0											**168**
1.2	**Professional training**				**73,0**	**2190,0**	**62,0**	**544,0**	**160,0**	**236,0**	**1250,0**	**3,0**	**4,0**	**3,0**	**4,0**	**12,0**	**15,0**	**17,0**	**20,0**	**8,0**	**9,0**	**13,0**	**12,0**	**6,0**	**9,0**			
PT 1	**Descriptive Geometry, Engineering and Computer Graphics**	1		CG	4,0	120,0	3,0	16,0		32,0	72,0	3,0	4,0															**163**
PT 2	**Electrotechnical Materials**	2		C	4,0	120,0	3,0	32,0	16,0		72,0			3,0	4,0													**133**
PT 3	**Theoretical Mechanics**	3		C	4,0	120,0	3,0	32,0		16,0	72,0					3,0	4,0											**166**
PT 4	**Fundamentals of Metrology and Electrical Measurements**	3		C	5,0	150,0	4,0	32,0	32,0		86,0					4,0	5,0											**173**
PT 5	**Theoretical Basics of Electrical Engineering p.1**	3		C	6,0	180,0	5,0	48,0	16,0	16,0	100,0					5,0	6,0											**137**
PT 6	**Theoretical Basics of Electrical Engineering p.2**	4		C	5,0	150,0	5,0	32,0	16,0	32,0	70,0							5,0	5,0									**137**
PT 7	**Fundamentals of Electronics**	4		C	5,0	150,0	4,0	48,0	16,0		86,0							4,0	5,0									**128**
PT 8	**Technical Mechanics**		4	CG	4,0	120,0	3,0	32,0		16,0	72,0							3,0	4,0									**148**
PT 9	**Theory of Automatic Control**	4		C	6,0	180,0	5,0	48,0	16,0	16,0	100,0							5,0	6,0									**129**
PT 10	**Electrical Machines**	5		C	6,0	180,0	5,0	48,0	16,0	16,0	100,0									5,0	6,0							**126**
PT 11	**Fundamentals of Power Electrical Engineering**	5		C	3,0	90,0	3,0	32,0		16,0	42,0									3,0	3,0							**130**
PT 12	**Fundamentals of Occupational Safety and Health**	6		C	3,0	90,0	3,0	24,0		12,0	54,0											3,0	3,0					**144**

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 13	**Theory of Electric Drive**	6		C	4,0	120,0	5,0	36,0		24,0	60,0											5,0	4,0					**129**
PT 14	**Power Supply of Industrial Enterprises and Energy Saving**	6		CP	5,0	150,0	5,0	36,0		24,0	90,0											5,0	5,0					**129**
PT 15	**Enterprise Economics**		7	C	3,0	90,0	2,0	16,0		16,0	58,0													2,0	3,0			**202**
PT 16	**Simulation of Electromechanical Systems**	7		C	6,0	180,0	4,0	32,0	32,0		116,0													4,0	6,0			**129**
2	**Practical Preparation**				**12,0**	**360,0**					**360,0**												**6,0**				**6,0**	
PP 1	**Practical Training***				6,0	180,0					180,0												6,0					**129**
PP 2	**Pre-graduation Practice***				6,0	180,0					180,0																6,0	**129**
3	**Attestation***				**6,0**	**180,0**					**180,0**																**6,0**	**129**
4	**Optional educational components**				**70,0**	**2100,0**	**46,0**	**224,0**	**62,0**	**106,0**	**1679,0**	**3,0**	**3,0**	**5,0**	**6,0**					**13,0**	**16,0**	**9,0**	**10,0**	**16,0**	**19,0**	**20,0**	**16,0**	
4.1	**Profile training**				28,0	840,0	17,0	224,0	62,0	106,0	448,0	3,0	3,0							4,0	4,0			10,0	11,0	12,0	10,0	
4.1.1	**Profiled discipline package 01 "Electromechanical Systems of Automation and Electric Drive"**				**28,0**	**840,0**	**17,0**	**224,0**	**62,0**	**106,0**	**448,0**	**3,0**	**3,0**							**4,0**	**4,0**			**10,0**	**11,0**	**12,0**	**10,0**	
OP1.1	**Introduction to Speciality. Introductory Practice**	1		R	3,0	90,0	3,0	16,0		32,0	42,0	3,0	3,0															**129**
OP1.2	**Control Converters of Automated Electric Drives**	5		C	4,0	120,0	4,0	48,0		16,0	56,0									4,0	4,0							**129**
OP1.3	**Dynamics of Electromechanical Systems**	7		CP	6,0	180,0	6,0	48,0	16,0	32,0	84,0													6,0	6,0			**129**
OP1.4	**Automatic Electric Drive of General Industrial Installations P.1**	7		C	5,0	150,0	4,0	32,0	16,0	16,0	86,0													4,0	5,0			**129**
OP1.5	**Automatic Electric Drive of General Industrial Installations P.2**	8		C	4,0	120,0		30,0	10,0	10,0	70,0															5,0	4,0	**129**
OP1.6	**Computer-Aided Design of Electric Drives**		8	C	3,0	90,0		20,0	20,0		50,0															4,0	3,0	**129**
OP1.7	**Automation of Technological Processes**		8	C	3,0	90,0		30,0			60,0															3,0	3,0	**129**
4.1.2	**Profiled discipline package 02 "Mechatronics and robotics"**				**28,0**	**840,0**	**17,0**	**224,0**	**52,0**	**116,0**	**448,0**	**3,0**	**3,0**							**4,0**	**4,0**			**10,0**	**11,0**	**12,0**	**10,0**	
OP2.1	**Introduction to Speciality. Introductory Practice**	1		R	3,0	90,0	3,0	16,0		32,0	42,0	3,0	3,0															**129**
OP2.2	**Power Elements of Mechatronics and Robotics Systems**	5		C	4,0	120,0	4,0	48,0		16,0	56,0									4,0	4,0							**129**
OP2.3	**Dynamic Characteristics of Mechatronic Systems**	7		CP	6,0	180,0	6,0	48,0	16,0	32,0	84,0													6,0	6,0			**129**
OP2.4	**Fundamentals of Mechatronics**	7		C	5,0	150,0	4,0	32,0	16,0	16,0	86,0													4,0	5,0			**129**
OP2.5	**Industrial Robots**	8		C	4,0	120,0		40,0		10,0	70,0															5,0	4,0	**129**
OP2.6	**Computer-Aided Design Systems in Mechatronics**		8	C	3,0	90,0		20,0	20,0		50,0															4,0	3,0	**129**
OP2.7	**Electric Equipment of Car and Electric Vehicle**		8	C	3,0	90,0		20,0		10,0	60,0															3,0	3,0	**129**
4.2	**Optional student disciplines of the profile preparation according to the list**				**30,0**	**900,0**	**20,0**				**880,0**			5,0	6,0					6,0	8,0	6,0	6,0	3,0	4,0	8,0	6,0	
4.3	**Optional student disciplines from the general university catalog of disciplines**				**12,0**	**360,0**	**9,0**				**351,0**									**3,0**	**4,0**	**3,0**	**4,0**	**3,0**	**4,0**			
OS1	**Discipline 1**		5		4,0	120,0	3,0				117,0									3,0	4,0							
OS2	**Discipline 2**		6		4,0	120,0	3,0				117,0											3,0	4,0					
OS3	**Discipline 3**		7		4,0	120,0	3,0				117,0													3,0	4,0			
	Total for education period				**240,0**	**7200,0**	**174,0**				**4771,0**	**25,0**	**30,0**	**25,0**	**30,0**	**25,0**	**30,0**	**26,0**	**30,0**	**25,0**	**30,0**	**24,0**	**30,0**	**24,0**	**30,0**	**22,0**	**30,0**	
	Hours per week											25,0		25,0		25,0		26,0		25,0		24,0		24,0		22,0		

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
	Number of exams											5		5		5		5		4		5		4		2		
	Number of tests											3		3		3		3		4		3		3		5		
	Number of course projects (works)													1						1		1		1				
	Numbers of disciplines per semester											8		8		8		8		8		8		7		7		

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 ____2.06____2023__

Vice-rector of Scientific-and-Pedagogical Work **Gennadyi KHRYPUNOV**

Head of the educational program Electric Drive, Mechatronics and Robotics **Mykola ANISHCHENKO**

Director of the Institute of Education and Science in Power Engineering, Electronics and Electromechanics **Roman TOMASHEVSKYI**

Head of the Department of Automated Electromechanical Systems **Bohdan VOROBIOV**

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List of optional student disciplines of the profile training

Code in accordance with the EPP	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	
							Classroom				Independent work	I course				II course		III course				IV course							
								including				Semesters																	
												1		2		3		4		5		6		7		8			
												Number of weeks in the semester																	
												20		20		20		20		20		20		20		20			
		Exams	Tests	Individual tasks	Number of ECTS credits	Total amount	Total	Lectures	Laboratory works	Practical studies		Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits	Classroom hours	ECTS creits		
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**																												E-323i.e
OPT1	Fundamentals of Theory of Computer Systems in Electric Drive	2		CW	6,0	180,0	5,0	32,0	32,0	16,0	100,0			5,0	6,0													**129**	E-323i.e
OPT2	Fundamentals of Theory of Computer Systems in Mechatronics	2		CW	6,0	180,0	5,0	32,0	32,0	16,0	100,0			5,0	6,0													**129**	E-323i.e
OPT3	Information technology in electromechanics	2		CW	6,0	180,0	5,0	32,0	32,0	16,0	100,0			5,0	6,0													**129**	E-323i.e
OPT4	Synthesis of Automatic Control Systems		5	CW	4,0	120,0	3,0		16,0	32,0	72,0									3,0	4,0							**129**	E-323i.e
OPT5	Design of Control Systems in Mechatronics		5	CW	4,0	120,0	3,0		16,0	32,0	72,0									3,0	4,0							**129**	E-323i.e
OPT6	Design of automated control systems for electromechanical systems		5	CW	4,0	120,0	3,0		16,0	32,0	72,0									3,0	4,0							**129**	E-323i.e
OPT7	Fundamentals of Circuit Design	5		C	4,0	120,0	3,0	32,0	16,0		72,0									3,0	4,0							**129**	E-323i.e
OPT8	Circuitry Design	5		C	4,0	120,0	3,0	32,0	16,0		72,0									3,0	4,0							**129**	E-323i.e
OPT9	Fundamentals of Digital Circuit Design	5		C	4,0	120,0	3,0	32,0	16,0		72,0									3,0	4,0							**129**	E-323i.e
OPT10	Fundamentals of Microprocessor Technology	6		C	3,0	90,0	3,0	24,0	12,0		54,0											3,0	3,0					**129**	E-323i.e
OPT11	Microprocessor Technology in Mechatronics	6		C	3,0	90,0	3,0	24,0	12,0		54,0											3,0	3,0					**129**	E-323i.e
OPT12	Modern Microprocessor Technology	6		C	3,0	90,0	3,0	24,0	12,0		54,0											3,0	3,0					**129**	E-323i.e
OPT13	Elements of Automatic Electric Drive Control Systems	6		C	3,0	90,0	3,0	36,0			54,0											3,0	3,0					**129**	E-323i.e
OPT14	Information Elements of Mechatronics and Robotics Systems	6		C	3,0	90,0	3,0	36,0			54,0											3,0	3,0					**129**	E-323i.e
OPT15	Nodes of automated control systems for electromechanical systems	6		C	3,0	90,0	3,0	36,0			54,0											3,0	3,0					**129**	E-323i.e
OPT16	Control Systems of DC Electric Drives	7		C	4,0	120,0	3,0	32,0	16,0		72,0													3,0	4,0			**129**	E-323i.e
OPT17	Automated DC Electric Drive	7		C	4,0	120,0	3,0	32,0	16,0		72,0													3,0	4,0			**129**	E-323i.e
OPT18	Automatic control systems for DC electric drives	7		C	4,0	120,0	3,0	32,0	16,0		72,0													3,0	4,0			**129**	E-323i.e
OPT19	Control Systems of AC Electric Drives	8		C	3,0	90,0	0,0	30,0		10,0	50,0															4,0	3,0	**129**	E-323i.e
OPT20	Automated AC Electric Drive	8		C	3,0	90,0	0,0	30,0		10,0	50,0															4,0	3,0	**129**	E-323i.e
OPT21	Automatic control systems for AC electric drives	8		C	3,0	90,0	0,0	30,0		10,0	50,0															4,0	3,0	**129**	E-323i.e
OPT22	Design of Electromechanical Automation Systems		8	C	3,0	90,0	0,0	20,0	20,0		50,0															4,0	3,0	**129**	E-323i.e
OPT23	Embedded Computers Control Systems		8	C	3,0	90,0	0,0	20,0	20,0		50,0															4,0	3,0	**129**	E-323i.e
OPT24	Automation of technological processes in mechanical engineering		8	C	3,0	90,0	0,0	20,0		20,0	50,0															4,0	3,0	**129**	E-323i.e

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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				Department code
		ECTS credits	Hours	Semesters		
				Exam	Test	
1	2	3	4	5	6	7
1	**Obligatory educational components**	**152,0**	**4560,0**			**63,33%**
1.1	**General training**	79,0	2370,0			**52%**
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**	73,0	2190,0			**48%**
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	**Theoretical Mechanics**	4,0	120,0	3		**166**
PT 4	**Fundamentals of Metrology and Electrical Measurements**	5,0	150,0	3		**173**
PT 5	**Theoretical Basics of Electrical Engineering p.1**	6,0	180,0	3		**137**
PT 6	**Theoretical Basics of Electrical Engineering p.2**	5,0	150,0	4		**137**
PT 7	**Fundamentals of Electronics**	5,0	150,0	4		**128**
PT 8	**Technical Mechanics**	4,0	120,0		4	**148**
PT 9	**Theory of Automatic Control**	6,0	180,0	4		**129**
PT 10	**Electrical Machines**	6,0	180,0	5		**126**
PT 11	**Fundamentals of Power Electrical Engineering**	3,0	90,0	5		**130**
PT 12	**Fundamentals of Occupational Safety and Health**	3,0	90,0	6		**144**
PT 13	**Theory of Electric Drive**	4,0	120,0	6		**129**
PT 14	**Power Supply of Industrial Enterprises and Energy Saving**	5,0	150,0	6		**129**
PT 15	**Enterprise Economics**	3,0	90,0		7	**202**
PT 16	**Simulation of Electromechanical Systems**	6,0	180,0	7		**129**
2	**Practical Preparation**	**12,0**	**360,0**			**5,00%**
PP 1	**Practical Training***	6,0	180,0			**129**
PP 2	**Pre-graduation Practice***	6,0	180,0			**129**
3	**Attestation***	**6,0**	**180,0**			**2,50%**
4	**Optional educational components**	**70,0**	**2100,0**			**29,17%**
4.1	**Profile training**	**28,0**	**840,0**			**40%**
4.1.1	**Profiled discipline package 01 "Electromechanical Systems of Automation and Electric Drive"**	**28,0**	**840,0**			
OP1.1	**Introduction to Speciality. Introductory Practice**	3,0	90,0	1		**129**
OP1.2	**Control Converters of Automated Electric Drives**	4,0	120,0	5		**129**
OP1.3	**Dynamics of Electromechanical Systems**	6,0	180,0	7		**129**
OP1.4	**Automatic Electric Drive of General Industrial Installations P.1**	5,0	150,0	7		**129**
OP1.5	**Automatic Electric Drive of General Industrial Installations P.2**	4,0	120,0	8		**129**
OP1.6	**Computer-Aided Design of Electric Drives**	3,0	90,0		8	**129**
OP1.7	**Automation of Technological Processes**	3,0	90,0		8	**129**
4.1.2	**Profiled discipline package 02 "Mechatronics and robotics"**	28,0	840,0			
OP2.1	**Introduction to Speciality. Introductory Practice**	3,0	90,0	1		**129**
OP2.2	**Power Elements of Mechatronics and Robotics Systems**	4,0	120,0	5		**129**
OP2.3	**Dynamic Characteristics of Mechatronic Systems**	6,0	180,0	7		**129**
OP2.4	**Fundamentals of Mechatronics**	5,0	150,0	7		**129**
OP2.5	**Industrial Robots**	4,0	120,0	8		**129**
OP2.6	**Computer-Aided Design Systems in Mechatronics**	3,0	90,0		8	**129**
OP2.7	**Electric Equipment of Car and Electric Vehicle**	3,0	90,0		8	**129**
4.2	**Optional student disciplines of the profile preparation according to the list**	30,0	900,0			**43%**
4.3	**Optional student disciplines from the general university catalog of disciplines**	12,0	360,0			**17%**
OS1	**Discipline 1**	4,0	120,0		5	
OS2	**Discipline 2**	4,0	120,0		6	
OS3	**Discipline 3**	4,0	120,0		7	
	Total for education period	**240,0**	**7200,0**			