APPROVED BY

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

CURRICULUM

educational and professional program

Applied mechanics in the field of

Rector of NTU "KNIP" training training

second (master's) level (higher education level)

knowledge

13 Mechanical engineering

(Knowledge field code and title)

SOKOL180

by specialty

- 131

Applied mechanics

Qualification

master's degree in applied mechanics

Period of study 1

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1 year 4 months

on the

basis of

bachelor's degree

02 06 2023

Form of study

I. Schedule of Education Process

E S	S	Sep	ter	nb	er	I		Oc	tob	er		I		No	ve	m	be	r			De	ce	mb	er	Ι		J	an	uary	,			Feb	ru	ary	8		N	larc	h		Г	-	٩pr	ril				Ma	ıy		Ŧ		Ju	ne		Т	_	J	luly	_	_	Т	A	ugi	ust	
ဒိ	1		2	3	4		5	6	7	_	8	1	9	10	1	1	12	1	3	14	1	15	16	1	7	18	19	20	2	1	22	23	24	4 2	25	26	27	28	3 2	9	30	31	3	2 3	33	34	35	36	3	7 3	8 3	9 4	40 4	41	42	43	4	4		Ť	47	48	49	_	Ť		_
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2	Р	1	Р	P	F	1	Р	Р	F	2	Р	(2	Q	1	2	Q	1	2	Q	\prod	οТ	D						T	T										T			T	man (Chi			•		200			+	_	-	_		+	+	*	•	V	_	\ \	+	+	<u>*</u>	<u>v</u>

Legend:

Theoretical study

E Exam Session

P Practice

full-time

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 project (work)	Vacation	Total
1	32	8				12	52
2			8	. 2	6		16
total	32	8	8	2	6	12	68

III. Practice

Type of practice	Duration (in weeks)	Semester
Prediploma	8	3

IV. Attestation

Measures	Number of ECTS credits	Semester
Preparation of qualification work	11,0	3
Defending of qualification work	4,0	3
Proficiency examination		

Форма Мол1-21_(1,4) V. EDUCATION PROCESS PLAN

0		Seme	ester distri	ibution				Number	of hours			Distribu		ssroom ho			nd ECTS		
ЕРР					†			Class	room					ourse			urse		
he													Seme	esters		Seme	ester	1	
₹									including				1	2	2		3		
in accordance with the					ts								Numbe	r of weeks	s in the se	emester			
anc	Name of academic discipline				credits							2	20	2	0	1	6		
ord					S				S)	ι _ο	ž	S		S		s			
acc				sks	ECTS	±			works	die	t w	Joon	w	onr	ω,	non	w		
.⊑				Ta ta	of E	amount			ry v	stn	deni	E .	credits	E H	credits	E	credits	ent	
Code		દ		qng		аш		ires	rato	ical)eu	00	C.	100	Cre	0	cre	F.	
0		Exams	Fests	Individual tasks	Number	Total	Total	-ectures	_aboratory	Practical studies	Independent work	Classroom hours	ECTS	Classroom hours	ECTS	Classroom hours	ECTS	Department	
1	2	Ш 3	4	5	2 6	7	8	9	10	<u>0</u> 11	12	13	<u>Ш</u> 14	15	<u>Ш</u> 16	17	<u>Ш</u> 18	29	_
1	Obligatory educational components	3	-	3	28.0	840.0	320.0	176.0	32.0	112.0	520.0	12,0	17.0	8.0	11.0	- 17	10	29	MIT-M223.e
1.1	General training				9,0	270,0	96,0	32,0	- /-	64,0	174,0	6,0	9,0	-,-	,-				MIT-M223.e
GT 1	Intellectual Property		1	R	3,0	90,0	32,0	16,0		16,0	58,0	2,0	3,0					202	MIT-M223.e
GT 2	Innovative Entrepreneurship and		1	R	3,0	90.0	32,0	16,0		16,0	58,0	2,0	3,0					202	
GTZ	Management of Startup Projects		ı	K	3,0	90,0	32,0	10,0		10,0	36,0	2,0	3,0					202	MIT-M223.e
GT 3	Foreign Language for Professional		1	R	3.0	90.0	32,0			32,0	58,0	2,0	3,0					275	
	Purposes		'	11	,	,	,			,	,	ŕ	,					2/3	MIT-M223.e
1.2	Professional training			_	19,0	570,0	224,0	144,0	32,0	48,0	346,0	6,0	8,0	8,0	11,0				MIT-M223.e
PT 1 PT 2	Modern technologies in applied mechanics Work processes of modern productions	1		R R	4,0 4,0	120,0 120,0	48,0 48,0	32,0 32,0	16,0 16,0		72,0 72,0	3,0 3,0	4,0 4,0					140 140	MIT-M223.e MIT-M223.e
	Modeling and design of processes, products,				<i>'</i>	,	,	· · · · ·	10,0		,	3,0	4,0						IVII I -IVIZZS.E
PT 3	equipment	2		RG	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			140	MIT-M223.e
PT 4	Certification and metrological quality assurance	2		R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			140	MIT-M223.e
PT 5	Basics of the scientific research	2		R	3,0	90,0	32,0	16,0		16,0	58,0			2,0	3,0			140	MIT-M223.e
2	Practical training				15,0	450,0					450,0						15,0		MIT-M223.e
PP 1	Pre-graduation practice*		3		15,0	450,0					450,0						15,0	140	MIT-M223.e
3	Attestation*	3			15,0	450,0					450,0						15,0	140	MIT-M223.e
4	Optional educational component				32,0	960,0	400,0	176,0	64,0	64,0	560,0	13,0	16,0	12,0	16,0				MIT-M223.e
4.1	Profile training				24,0	720,0	304,0	176,0	64,0	64,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
4.1.1	Profiled discipline package 01"Integrated engineering technologies"				24,0	720,0	304,0	176,0	64,0	64,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 1.1	High technologies in mechanical engineering	1		KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					147	MIT-M223.e
OP 1.2	System analysis, structural and parametric optimization		1	R	6,0	180,0	80,0	48,0	32,0		100,0	5,0	6,0					147	MIT-M223.e
OP 1.3	Additive technologies of materialization of industrial products	2		KR	6,0	180,0	64,0	32,0		32,0	116,0			4,0	6,0			147	MIT-M223.e
OP 1.4	Laser and combined technologies		2	R	6,0	180,0	80,0	48,0	16,0	16,0	100,0			5,0	6,0			147	MIT-M223.e
4.1.2	Profiled discipline package 02"Tool production"				24,0	720,0	304,0	176,0	112,0	16,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 2.1	Theory of 3D modeling	1		KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					147	MIT-M223.e
OP 2.2	Theory of designing tools and CAD systems		1	R	6,0	180,0	80,0	48,0	32,0		100,0	5,0	6,0	4.0	6.0			147	MIT-M223.e
OP 2.3 OP 2.4	Special technologies of tool production Design of tool shops and divisions	2	2	KR R	6,0 6,0	180,0 180,0	64,0 80,0	32,0 48,0	32,0 32,0		116,0 100,0			4,0 5,0	6,0 6,0			147 147	MIT-M223.e MIT-M223.e
	Profiled discipline package 03 "Technology of			K		,	,		,					,				14/	ivii i -ivi∠∠3.e
4.1.3	automated production"				24,0	720,0	304,0	192,0	64,0	48,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 3.1	CALS technologies in mechanical engineering	1		R	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					146	MIT-M223.e

Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	29	
MS 3 machines — " " " " MS 4 machines — " " " " MS 50 MS 60	OP 3.2			1	KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					146	MIT-M223.e
0R-55 Automation of assembly production 2 RE 3,0 30,0 320 320 48,0 40,0 10				2	KR	5,0	,	- /-	,	,	16,0	/ -			4,0	5,0			146	MIT-M223.e
## Profiled disciplines package 44 "Netal Cutting methods and systems" Profiled disciplines package 44 "Netal Cutting of metal cutting 1			2			,		,		16,0		,			,					
Marketines and systems OF 4.0 4.0 100 0 8.0 4.0 16.0 16.0 16.0 100.0 5.0 6.0 1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	OP 3.5			2	RE	3,0	90,0	32,0	32,0			58,0			2,0	3,0			146	MIT-M223.e
0 4 - 1	4.1.4	machines and systems"				24,0	720,0	304,0	192,0	48,0	64,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
or Land equipment of equipment of logistics of components of technological equipment of logistics systems* Or 5.1 Fedical discipline package of "Engineering of Engineering of Engineerin	OP 4.1	equipment	1		R	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					146	MIT-M223.e
### MIT-M223 e ### A0 1200 48.0 32.0 18.0 68.0 48.0 32.0 3.0 4.0 4.0 3.0 4.0 146 MIT-M223 e ### A0 1200 48.0 32.0 32.0 32.0 18.0 68.0 42.0 3.0 4.0 146 MIT-M223 e ### A0 1200 48.0 32.0 32.0 32.0 18.0 68.0 48.0 32.0 3.0 3.0 146 MIT-M223 e ### A15 69/Hat discipling package 65 Engineering of establishing and dereyonering of technological and components of technological and technological and components of technological and techno	OP 4.2	equipment		1	KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					146	MIT-M223.e
Mit-M223 e Del systems	OP 4.3	machines		2	KR	5,0	150,0	64,0	32,0	16,0	16,0	86,0			4,0	5,0			146	MIT-M223.e
Part	OP 4.4	tool systems	2		R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			146	MIT-M223.e
MIT-M223 a place systems MIT-M223 a place MIT	OP 4.5	equipment		2	RE	3,0	90,0	32,0	32,0			58,0			2,0	3,0			146	MIT-M223.e
Process of Controlling Power circuits of hydropronumatic systems 1 R 6,0 180,0 80,0 48,0 32,0 32,0 100,0 5,0 6,0 149 MIT-M223.e	4.1.5					24,0	720,0	304,0	128,0	96,0		416,0	10,0	12,0	4,0	5,0				MIT-M223.e
Mit-M223a Systems	OP 5.1	equipment	1		RG	6,0	180,0	80,0	48,0	32,0		100,0	5,0	6,0					149	MIT-M223.e
ransport and storage complexes	OP 5.2	systems		1	KR	6,0	180,0	80,0	48,0	32,0		100,0	5,0	6,0					149	MIT-M223.e
OP 5.5 Administration of logistics systems 4.1.6 Declaration of logistics systems 4.1.7 Declaration of logistics systems 4.1.7 Declaration of logistics systems 4.1.8 Declaration of logistics systems 4.1.9 Declaration of logistics systems 4.1.8 Declaration of logistics systems 4.1.8 Declaration of logistics systems 4.1.9 Perillia discipline package 09 *Computerized 4.1.0 Perillia discipline package 09 *Computerized 4.1.0 Perillia discipline package 09 *Computerized 4.1.0 Perillia discipline package 09 *Computeri	OP 5.3	transport and storage complexes		2			,	,	· ·	32,0		,				, i				
Profiled discipline package 06 *Smart hydro-			2				- , -			16						,				
MIT-M223.e MIT	OP 5.5			2	RE	3,0	90,0	32,0	32,0			58,0			2,0	3,0			149	MIT-M223.e
Nydropneumatic systems	4.1.6	pneumatic systems"				24,0	720,0	304,0	128,0	64,0	64,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
Design of hydraulic and pneumatic power circuits of hydropneumatic systems 2 RG 6,0 180,0 64,0 32,0 32,0 116,0 4,0 6,0 148 MIT-M223.e	OP 6.1			1		- / -	/ -	/ -	· ·	-,-	-,-	/-		6,0					148	MIT-M223.e
Independent systems 2 RR 6,0 180,0 80,0 32 16 32,0 100,0 5,0 6,0 148 MIT-M223.e	OP 6.2		1		RG	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					148	MIT-M223.e
CP 6.4 to the modeling of physical processes in hydropneumatic systems 2 RG 6.0 180.0 80.0 32 16 32.0 100.0 5.0 6.0 148 MIT-M223.e	OP 6.3	hydropneumatic systems	2		KR	6,0	180,0	64,0	32,0	32,0		116,0			4,0	6,0			148	MIT-M223.e
CPT.1 Quality management systems 1 KR 6,0 180,0 80,0 48,0 16,0 10,0 5,0 6,0 147 MIT-M223.e OP 7.2 Standardization of products and services 1 R 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 147 MIT-M223.e OP 7.3 Adulti of quality systems 2 R 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 147 MIT-M223.e OP 7.4 Qualimetry, quality management and product competitiveness 2 R 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 147 MIT-M223.e OP 7.4 Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing" OP 8.2 Theory of processes in pressure treatment 1 KR 6,0 180,0 80,0 48,0 16,0 16,0 10,0 5,0 6,0 141 MIT-M223.e OP 8.3 Modern methods of scientific research in pressure ratement 2 KR 5,0 150,0 64,0 48,0 16,0 16,0 10,0 5,0 6,0 141 MIT-M223.e QP 8.4 Additive technologies and production 2 R 4,0 120,0 48,0 32,0 16,0 16,0 10,0 12,0 9,0 12,0 14,0 MIT-M223.e QP 8.5 Designing workshops and districts 2 RE 3,0 90,0 32,0 32,0 128,0 48,0 48,0 48,0 46,0 10,0 12,0 9,0 12,0 12,0 12,0 12,0 12,0 12,0 12,0 12	OP 6.4	to the modeling of physical processes in		2	RG	6,0	180,0	80,0	32	16	32,0	100,0			5,0	6,0			148	MIT-M223.e
OP 7.1 Quality management systems 1 KR 6,0 180,0 80,0 48,0 16,0 100,0 5,0 6,0 147 MIT-M223.e OP 7.2 Standardization of products and services 1 RR 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 147 MIT-M223.e OP 7.3 Audit of quality systems 2 KR 6,0 180,0 80,0 48,0 32,0 116,0 5,0 6,0 147 MIT-M223.e OP 7.4 Qualimetry, quality management and product competitiveness OP 7.5 Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing" OP 8.1 Methods of computational mathematics in pressure processing Theory of processes in pressure treatment 1 KR 6,0 180,0 80,0 48,0 16,0 10,0 10,0 5,0 6,0 MIT-M223.e OP 8.2 Theory of processes in pressure treatment 2 KR 5,0 150,0 64,0 48,0 16,0 16,0 10,0 5,0 6,0 MIT-M223.e OP 8.3 Modern methods of scientific research in pressure treatment 2 KR 5,0 150,0 64,0 48,0 32,0 16,0 72,0 30,0 4,0 141 MIT-M223.e OP 8.4 Additive technologies and production 2 R 4,0 120,0 48,0 32,0 16,0 72,0 30,0 12,0 9,0 12,0 MIT-M223.e OP 8.5 Designing workshops and districts 2 RE 3,0 90,0 32,0 32,0 18,0 48,0 48,0 48,0 48,0 48,0 48,0 416,0 10,0 12,0 9,0 12,0 MIT-M223.e	4.1.7					24,0	720,0	304,0				416,0	10,0	12,0	9,0	12,0				MIT-M223 A
OP 7.2 Standardization of products and services 1 R 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 4,0 6,0 147 MIT-M223.e OP 7.3 Audit of quality systems 2 KR 6,0 180,0 64,0 32,0 32,0 116,0 4,0 6,0 147 MIT-M223.e OP 7.4 Qualimetry, quality management and product competitiveness 2 R 6,0 180,0 80,0 48,0 32,0 100,0 5,0 6,0 147 MIT-M223.e 4.1.8 Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing" 2 R 6,0 180,0 80,0 64,0 416,0 10,0 12,0 9,0 12,0 MIT-M223.e OP 8.1 Methods of computational mathematics in pressure processing 1 R 6,0 180,0 80,0 64,0 16,0 100,0 5,0 6,0 MIT-M223.e OP 8.1 Modern methods of scientific research in pressure treatment 1<	OP 7.1	Quality management systems	1		KR	6.0	180.0	80.0	48.0	16.0	16.0	100.0	5.0	6.0					147	
OP 7.3 Audit of quality systems 2 KR 6,0 180,0 64,0 32,0 32,0 116,0 4,0 6,0 147 MIT-M223.e		, , , ,	· .	1				,	,	,	-,-	,	,							
Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing" 24,0 720,0 304,0 224,0 16,0 64,0 416,0 10,0 12,0 9,0 12,0 MIT-M223.e 24,0 720,0 304,0 224,0 16,0 64,0 416,0 10,0 12,0 9,0 12,0 MIT-M223.e Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing" At a competitiveness			2									116,0		*	4,0	6,0				_
### MIT-M223.e ###################################	OP 7.4	competitiveness		2	R	6,0	180,0	80,0	48,0	32,0		100,0			5,0	6,0			147	MIT-M223.e
OP 8.1 Methods of computational mathematics in pressure processing 1 R 6,0 180,0 80,0 64,0 16,0 100,0 5,0 6,0 141 processing MIT-M223.e OP 8.2 Theory of processes in pressure treatment 1 KR 6,0 180,0 80,0 48,0 16,0 100,0 5,0 6,0 141 processing MIT-M223.e 141 processing MIT-M223.e 142 processing 141 processing 142 processing 143 processing 144 processing <	4.1.8	modeling and integrated technologies of				24,0	720,0	304,0	224,0	16,0	64,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 8.2 Theory of processes in pressure treatment 1 KR 6,0 180,0 80,0 48,0 16,0 100,0 5,0 6,0 141 MIT-M223.e OP 8.3 Modern methods of scientific research in pressure treatment 2 KR 5,0 150,0 64,0 48,0 16,0 86,0 4,0 5,0 141 MIT-M223.e OP 8.4 Additive technologies and production 2 R 4,0 120,0 48,0 32,0 16,0 72,0 3,0 4,0 MIT-M223.e OP 8.5 Designing workshops and districts 2 RE 3,0 90,0 32,0 32,0 58,0 2,0 3,0 141 MIT-M223.e 4.1.9 Profiled discipline package 09 "Computerized founds and invariance of the control of a resistion of a control of a resistion of a res	OP 8.1	Methods of computational mathematics in pressure	1		R	6,0	180,0	80,0	64,0		16,0	100,0	5,0	6,0					141	MIT-M223.e
Treatment	OP 8.2			1	KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					141	
OP 8.5 Designing workshops and districts 2 RE 3,0 90,0 32,0 32,0 58,0 2,0 3,0 141 MIT-M223.e 4.1.9 Profiled discipline package 09 "Computerized founds are districts and involve control." 24,0 720,0 304,0 128,0 48,0 48,0 48,0 416,0 10,0 12,0 9,0 12,0	OP 8.3			2	KR	5,0	150,0	64,0	48,0		16,0	86,0			4,0	5,0			141	MIT-M223.e
4.1.9 Profiled discipline package 09 "Computerized 24,0 720,0 304,0 128,0 48,0 48,0 416,0 10,0 12,0 9,0 12,0	OP 8.4		2						,		16,0	,			,	,				_
4.1.9 foundry production artistic and involvy casting" 24,0 720,0 304,0 120,0 40,0 410,0 10,0 12,0 9,0 12,0	OP 8.5	Designing workshops and districts		2	RE	3,0	90,0	32,0	32,0			58,0			2,0	3,0			141	MIT-M223.e
	4.1.9					24,0	720,0	304,0	128,0	48,0	48,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e

	_							1 -											7
1	2 Resource-saving technologies and melting of alloys	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	29	4
OP 9.1	with special properties	1		R	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					142	MIT-M223.e
OP 9.2	Automation of foundry production		1	KR	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					142	MIT-M223.e
OP 9.3	Technology of artistic and jewelry casting		2	KR	5,0	150,0	64,0	32,0	16,0	16,0	86,0			4,0	5,0			142	MIT-M223.e
OP 9.4	Additive technologies in foundry production	2		R	4,0	120,0	48,0	32	16		72,0			3,0	4,0			142	MIT-M223.e
OP 9.5	Alloys for artistic and jewelry molding		2	RE	3,0	90,0	32,0	32			58,0			2,0	3,0			142	MIT-M223.e
4.1.10	Profiled discipline package 10 "Digital hydraulics, hydraulic machines and hydropneumatic drives"				24,0	720,0	304,0	208,0	48,0	48,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 10.1	Dynamics of hydropneumatic systems	1		CP	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					150	MIT-M223.e
	CAD of hydropneumatic drives		1	RG	6,0	180,0	80,0	48,0	16,0	16,0	100,0	5,0	6,0					150	MIT-M223.e
OP 10.3	Proportional hydraulics		2	RG	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			150	MIT-M223.e
OP 10.4	Design and calculation of volumetric hydraulic machines and hydropneumatic systems	2		KR	5,0	150,0	64,0	48,0		16,0	86,0			4,0	5,0			150	MIT-M223.e
OP 10.5	Operation of hydropneumatic drives of technological equipment		2	R	3,0	90,0	32,0	32,0			58,0			2,0	3,0			150	MIT-M223.e
4.1.11	Profiled discipline package 11 "Welding and related processes and technologies"				24,0	720,0	304,0	176,0	48,0		416,0	10,0	12,0	4,0	5,0				MIT-M223.e
OP 11.1	Experimental methods in welding	1		RE	6,0	180,0	80,0	64,0	16,0		100,0	5,0	6,0					145	MIT-M223.e
OP 11.2	Ability to weld structural materials		1	KR	6,0	180,0	80,0	64,0	16,0		100,0	5,0	6,0					145	MIT-M223.e
OP 11.3	Modernization of welding shops		2	KR	5,0	150,0	64,0	48,0	16,0		86,0			4,0	5,0			145	MIT-M223.e
OP 11.4	Welding of special steels and non-ferrous alloys	2		RE	4,0	120,0	48,0	48			72,0			3	4,0			145	MIT-M223.e
OP 11.5	Surface engineering		2	RE	3,0	90,0	32,0	32			58,0			2,0	3,0			145	MIT-M223.e
4.1.12	Profiled discipline package 12 "Computer modeling of technical systems"				24,0	720,0	304,0	192,0		112,0	416,0	10,0	12,0	9,0	12,0				MIT-M223.e
OP 12.1	Modern methods of mathematical and computer modeling	1		R	6,0	180,0	80,0	48,0		32,0	100,0	5,0	6,0					151	MIT-M223.e
OP 12.2	Computerized design of complex mechanical objects and systems		1	R	6,0	180,0	80,0	48,0		32,0	100,0	5,0	6,0					151	MIT-M223.e
OP 12.3	Computer systems for the justification of project decisions		2	R	5,0	150,0	64,0	32,0		32,0	86,0			4,0	5,0			151	MIT-M223.e
OP 12.4	Research of connected physical and mechanical processes in modern CAD	2		KR	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			151	MIT-M223.e
OP 12.5	Mathematical modeling in modern CAD		2	R	3,0	90,0	32,0	32,0			58,0			2,0	3,0			151	MIT-M223.e
4.2	Optional student disciplines of the profile preparation according to the list (the list is attached)				8,0	240,0	96,0				144,0	3	4	3	4				MIT-M223.e
	Total for education period				90.0	2700.0	720.0	352.0	96.0	176.0	1980.0	25,0	33,0	20.0	27.0		30.0		MIT-M223.e
	Hours per week				30,0	2700,0	120,0	332,0	30,0	170,0	1900,0		5.0	20,0	,-		30,0		MIT-M223.e
	Number of exams												4	4	, -				MIT-M223.e
	Number of exams Number of tests												3	3			ı		MIT-M223.e
	Number of course projects (works)											-		1			•		MIT-M223.e
	Numbers of disciplines per semester												.0	5.					MIT-M223.e
	Manipers of disciplines per semester												,•	5,					IVII I -IVIZZO.G

	Individual tasks
С	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 2023p.

Guarantor of the educational and professional Vice-rector for scientific and pedagogical work program - Applied Mechanics Gennadiy KHRYPUNOV Olexander SHELKOVIY Director of the Educational and Scientific Institute of Mechanical Engineering and Head of the department "Theory and systems of Transport Vitaly EPIFANOV automated design of mechanisms and machines" Technologies of Mechanical Engineering Olexander SHELKOVIY Head of the "Welding" department Olexander PERMYAKOV Andrii ROGOVY **Engineering Technology and Metal Cutting** Head of the Department "Hydraulic Machines" 'alentyn KOVALENKO hydropneumatic systems" __natoly HAIDAMAKA Head of the department "Lifting - transport and Integrated Pressure Processing Head of the department "Foundry production"

0		Seme	ester distri	bution				Number	of hours			Distribu			ours per a		ECTS	
in accordance with the EPP								Class	room				1 co	urse		2 co	urse	
the									See a bood to see				Seme	sters		Sem	ester	
₽									including				1	:	2	:	3	
e e					ţ								Numbe	er of week	s in the se	mester		
auc	Name of academic discipline				credits							2	20	2	20	1	6	
ord					S				S)	w	ž	S		S		S		
acc				sks	i:	±			vorł	die	, K	non	w	Joon	ω	Joon	w	
.⊑				Individual tasks	Number of ECTS	Total amount			Laboratory works	Practical studies	Independent work	Classroom hours	credits	Classroom hours	credits	Classroom hours	ECTS credits	Department
Code		SL		idua	per	am		ries	ratc	Sa	Sen	200	CC	20	C	00.	CC	l fi
0		Exams	Tests	divi	- En	otal	Total	Lectures	abo	ract	dep	lass	CTS	lass	ECTS	lass	CTS	ebs
1	2	3	4	5		7	8	9	10	<u>∩</u> 11	12	13	ய் 14	ن 15	- 16	17	- 18	29
	Optional student disciplines of the profile		_		Ů	,	,	J	10		1.2	10		.0	10	.,	10	
4.2	training																	
OPT 1	Diagnostics and control of technological processes	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					147
	Reverse engineering	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					147
OPT 3	Integrated production systems	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					146
OPT 4	Control systems for machines and machine complexes	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					146
OPT 5	WMS. Management systems of warehouse complexes	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					149
	Design of intelligent hydropneumatic systems	1		R	4,0	120,0	48,0	32,0		16,0	72,0	3,0	4,0					148
OPT 7	Marketing and quality monitoring	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					147
OPT 8	Machines, automatic lines and complexes in pressure processing	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					141
OPT 9	Finishing operations in the production of castings	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					142
OPT 10	Mathematical modeling of the working process of hydraulic machines	1		R	4,0	120,0	48,0	32,0	16,0		72,0	3,0	4,0					150
OPT 11	Justification and improvement of technologies for restoration of parts	1		R	4,0	120,0	48,0	48,0			72,0	3,0	4,0					145
OPT 12	Computer modeling of dynamic systems	1		R	4,0	120,0	48,0	32,0		16,0	72,0	3,0	4,0					151
OPT 13	Post-processes of integrated generative technologies		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			147
OPT 14	Formation of the structure and properties of modern instrumental materials		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			147
OPT 15	Special energy-efficient technologies		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			146
OPT 16	Special means of processing and accounting for cargo in logistics centers		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			149
OPT 17	Basics of calculation and design of electrohydraulic and electropneumatic converters		2	R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			148
OPT 18	Certification of products and services		2	R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			147
OPT 19	Systems of automated design of stamps and equipment in pressure processing		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			141
OPT 20	Design of foundry workshops and districts		2	R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			142
OPT 21	Modeling of fluid flow in the flow part of hydraulic machines		2	R	4,0	120,0	48,0	32,0	16,0		72,0			3,0	4,0			150
OPT 22	Mechanization, automation and robotization of welding processes		2	R	4,0	120,0	48,0	48,0			72,0			3,0	4,0			145
OPT 23	Computer research of mechanical systems		2	R	4,0	120,0	48,0	32,0		16,0	72,0			3,0	4,0			151

CONTENT of CURRICULUM

for the master`s training:

by specialty

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Applied mechanics

<u> </u>			Total amo	unt		<u> </u>
Number in order	Discipline title	ECTS credits	Hours		esters	Department code
1	2	3	4	Exam	Test	7
1	Obligatory educational components	28,0	840,0	5	6	31%
1.1	General training	9,0	270,0			10%
GT 1	Intellectual Property	3,0	90,0		1	202
GT 2	Innovative Entrepreneurship and Management of Startup Projects	3,0	90,0		1	202
GT 3	Foreign Language for Professional Purposes	3,0	90,0		1	275
1.2	Professional training	19,0	570,0			21%
PT 1 PT 2	Modern technologies in applied mechanics Work processes of modern productions	4,0 4,0	120,0 120,0	1		140 140
PT 3	Modeling and design of processes, products, equipment	4,0	120,0	2		140
PT 4	Certification and metrological quality assurance	4,0	120,0	2		140
PT 5	Basics of the scientific research	3,0	90,0	2		140
2	Practical training	15,0	450,0			17%
PP 1	Pre-graduation practice*	15,0	450,0	_	3	140
3	Attestation*	15,0	450,0	3		17%
4	Optional educational component	32,0	960,0			36%
4.1	Profile training	24,0	720,0			27%
4.1.1 OP 1.1	Profiled discipline package 01"Integrated engineering technologies" High technologies in mechanical engineering	24,0 6,0	720,0 180,0	1		147
OP 1.1	System analysis, structural and parametric optimization	6,0	180,0	T	1	147
OP 1.3	Additive technologies of materialization of industrial products	6,0	180,0	2		147
OP 1.4	Laser and combined technologies	6,0	180,0		2	147
4.1.2 OP 2.1	Profiled discipline package 02"Tool production" Theory of 3D modeling	24,0 6,0	720,0 180,0	1		147
OP 2.2	Theory of designing tools and CAD systems	6,0	180,0	'	1	147
OP 2.3	Special technologies of tool production	6,0	180,0	2		147
OP 2.4	Design of tool shops and divisions	6,0	180,0		2	147
4.1.3 OP 3.1	Profiled discipline package 03 "Technology of automated production" CALS technologies in mechanical engineering	24,0 6,0	720,0 180,0	1		146
OP 3.2	Machine tools	6,0	180,0	'	1	146
OP 3.3	Automated programming systems for CNC machines	5,0	150,0		2	146
OP 3.4	Precision equipment of automated production	4,0	120,0	2		146
OP 3.5	Automation of assembly production Profiled discipline package 04 "Metal cutting machines and systems"	3,0 24,0	90,0 720 ,0		2	146
OP 4.1	Dynamics and computer modeling of metal cutting equipment	6,0	180,0	1		146
OP 4.2	Diagnostics and operation of technological equipment	6,0	180,0		1	146
OP 4.3	Automated programming systems for CNC machines	5,0	150,0		2	146
OP 4.4 OP 4.5	Reliability and environmental friendliness of machine tool systems Mechatronics and components of technological equipment	4,0 3,0	120,0 90,0	2	2	146 146
4.1.5	Profiled discipline package 05 "Engineering of logistics systems"	24,0	720,0		2	140
OP 5.1	Monitoring and diagnostics of cargo handling equipment	6,0	180,0	1		149
OP 5.2	Technical and technological equipment of logistics systems	6,0	180,0		1	149
OP 5.3 OP 5.4	Visualization and 3D modeling in automated transport and storage complexes	5,0 4,0	150,0 120,0	2	2	149 149
OP 5.4 OP 5.5	Modeling and optimization of systems Administration of logistics systems	3,0	90,0		2	149
4.1.6	Profiled discipline package 06 "Smart hydro-pneumatic systems"	24,0	720,0		_	
	Methods of controlling power circuits of hydropneumatic systems	6,0	180,0	ļ.,	1	148
OP 6.2 OP 6.3	Fluid and gas mechanics Design of hydraulic and pneumatic power circuits of hydropneumatic systems	6,0 6,0	180,0 180,0	2		148 148
	The application of engineering software complexes to the modeling of physical processes in					
OP 6.4	hydropneumatic systems	6,0	180,0		2	148
4.1.7	Profiled discipline package 07 "Standardization, certification and product quality	24,0	720,0			
OP 7.1	management" Quality management systems		180,0	1		147
OP 7.1	Standardization of products and services	6,0 6,0	180,0	 '	1	147
OP 7.3	Audit of quality systems	6,0	180,0	2		147
OP 7.4	Qualimetry, quality management and product competitiveness	6,0	180,0		2	147
4.1.8	Profiled discipline package 08 "Computer modeling and integrated technologies of pressure processing"	24,0	720,0			
OP 8.1	Methods of computational mathematics in pressure processing	6,0	180,0	1		141
OP 8.2	Theory of processes in pressure treatment	6,0	180,0		1	141
OP 8.3	Modern methods of scientific research in pressure treatment	5,0	150,0		2	141
OP 8.4	Additive technologies and production	4,0	120,0	2	2	141
OP 8.5	Designing workshops and districts	3,0	90,0		2	141
4.1.9	Profiled discipline package 09 "Computerized foundry production, artistic and jewelry casting"	24,0	720,0			
OP 9.1	Resource-saving technologies and melting of alloys with special properties	6,0	180,0	1		142
OP 9.2	Automation of foundry production	6,0	180,0		1	142
OP 9.3 OP 9.4	Technology of artistic and jewelry casting Additive technologies in foundry production	5,0 4,0	150,0 120,0	2	2	142 142
OP 9.4 OP 9.5	Alloys for artistic and jewelry molding	3,0	90,0		2	142
OP 9.6	.,	-,-				
OP 9.7				1		
OP 9.8				1		
OP 9.9 OP 9.10				1		
4.1.10	Profiled discipline package 10 "Digital hydraulics, hydraulic machines and hydropneumatic	24.0	720.0			
	drives"	24,0	720,0			
OP 10.1	Dynamics of hydropneumatic systems	6,0	180,0	1		150

1	2	3	4	5	6	7
OP 10.2	CAD of hydropneumatic drives	6,0	180,0		1	150
OP 10.3	Proportional hydraulics	4,0	120,0		2	150
OP 10.4	Design and calculation of volumetric hydraulic machines and hydropneumatic systems	5,0	150,0	2		150
OP 10.5	Operation of hydropneumatic drives of technological equipment	3,0	90,0		2	150
4.1.11	Profiled discipline package 11 "Welding and related processes and technologies"	24,0	720,0			
OP 11.1	Experimental methods in welding	6,0	180,0	1		145
OP 11.2	Ability to weld structural materials	6,0	180,0		1	145
OP 11.3	Modernization of welding shops	5,0	150,0		2	145
OP 11.4	Welding of special steels and non-ferrous alloys	4,0	120,0	2		145
OP 11.5	Surface engineering	3,0	90,0		2	145
4.1.12	Profiled discipline package 12 "Computer modeling of technical systems"	24,0	720,0			
OP 12.1	Modern methods of mathematical and computer modeling	6,0	180,0	1		151
OP 12.2	Computerized design of complex mechanical objects and systems	6,0	180,0		1	151
OP 12.3	Computer systems for the justification of project decisions	5,0	150,0		2	151
OP 12.4	Research of connected physical and mechanical processes in modern CAD	4,0	120,0	2		151
OP 12.5	Mathematical modeling in modern CAD	3,0	90,0		2	151
4.2	Optional student disciplines of the profile preparation according to the list (the list is attached)	8,0	240,0			9%
	Total for education period	90,0	2700,0			