MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Don State Technical University

Approved by Academic Council

Minutes № 9 *of* 21.03.2023

CURRICULUM

for Master programme

APPROVED

Vice-rector for AIA

Beskopylnyy A.N.

"___" _____ 2023

| 15.04.04 |

15.04.04 Automatization of technological processes and production
Technology profile: Big data and intelligent systems

Department: Automation of industrial processes
Faculty: Master programmes department

Study level: Master

Mode of study: Full-time
Duration: 2 years

Starting year of training (according to the curriculum) 2023

Educational standard № 1452 от 25.11.2020

Code	Areas and (or) spheres of occupational activity. Occupational standards.
06	Telecommunication and ICT
06.04	Big data expert

Types of professional activities
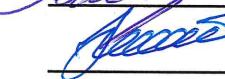industrial and technological

AGREED

Head of Academic policy department — / Nosachev S.V./

Head of Top-qualification staff training department — / Shilov A.V./

Dean — / Naumov I.I./

Head of AIP department — / Lukianov A.D./

For planning	Index	Title	Exam	Credit	Scoring	ECTS Expert	Hours for 1 ECTS	Plan	Review test	Self-study	Other contact hours	Assessment	T1 ECTS	T1 Lectures	T1 Labs	T1 Practical work	T1 Self-study assess	T1 Self-study	T1 Other contact	T1 Assessment	T2 ECTS	T2 Lectures	T2 Labs	T2 Practical work	T2 Self-study assess	T2 Self-study	T2 Other contact	T2 Assessment	T3 ECTS	T3 Lectures	T3 Labs	T3 Practical work	T3 Self-study assess	T3 Self-study	T3 Other contact	T3 Assessment	T4 ECTS	T4 Lectures	T4 Labs	T4 Practical work	T4 Self-study assess	T4 Self-study	T4 Other contact	T4 Assessment	Dept Code
Unit 1. Courses (modules)						90		3240	901.4	2160.1	4.4	178.5	27	96	16	160	21	606.3	1.3	71.4	27	72	32	142	28	625.2	1.4	71.4	27	64	32	144	28	667	1.3	35.7	9	24		24	14	261.6	0.4		
Compulsory						42		1512	394.3	1010.6	2.3	107.1	17	48		112	10	405.4	0.9	35.7	13	30		80	9	276.8	0.8	71.4	8	32		32	8	215.6	0.4		4	12		12	7	112.8	0.2		
+	Б1.О.01	Professional communication in a foreign language		1		5	36	180	48.2	131.8	0.2		5			48		131.8	0.2																										126
+	Б1.О.02	Fundamenatals of project activities		1		4	36	144	36.2	107.8	0.2		4	16		16	4	107.8	0.2																										2
+	Б1.О.03	Research methodology	1			5	36	180	51.3	93	0.3	35.7	5	16		32	3	93	0.3	35.7																									2
+	Б1.О.04	Industrial sensors and supervisory instruments		1		3	36	108	35.2	72.8	0.2		3	16		16	3	72.8	0.2																										2
+	Б1.О.05	Automatic electrical drive	2			4	36	144	33.3	75	0.3	35.7									4	10		20	3	75	0.3	35.7																	2
+	Б1.О.06	Mathematical modeling of automated control systems	2			5	36	180	43.3	101	0.3	35.7									5	10		30	3	101	0.3	35.7																	2
+	Б1.О.07	Project management for the industrial cluster		3		4	36	144	36.2	107.8	0.2																		4	16		16	4	107.8	0.2										2
+	Б1.О.08	Standardization and certification for automated control systems projects		3		4	36	144	36.2	107.8	0.2																		4	16		16	4	107.8	0.2										45
+	Б1.О.09	Automata-based programming		4		4	36	144	31.2	112.8	0.2																										4	12		12	7	112.8	0.2		2
+	Б1.О.10	Methods of automatic regulators optimization and adjustment			2	4	36	144	43.2	100.8	0.2										4	10		30	3	100.8	0.2																		2
Institutional						48		1728	507.1	1149.5	2.1	71.4	10	48	16	48	11	200.9	0.4	35.7	14	42	32	62	19	348.4	0.6		19	32	32	112	20	451.4	0.9	35.7	5	12		12	7	148.8	0.2		
+	Б1.В.01	Python programming language as a basis for big data processing		1		5	36	180	69.2	75.1	0.2	35.7	5	32		32	5	75.1	0.2	35.7																								2
+	Б1.В.02	Industrial Internet of Things: construction, equipment and operation		4		5	36	180	31.2	148.8	0.2																										5	12		12	7	148.8	0.2		2
+	Б1.В.03	Big data processing methods in the Matlab mathematical package			3	5	36	180	55.2	124.8	0.2																		5	16	16	16	7	124.8	0.2										2
+	Б1.В.04	Neural network algorithms for data processing in control systems		1		5	36	180	54.2	125.8	0.2		5	16	16	16	6	125.8	0.2																										2
+	Б1.В.05	Fundamentals of Artificial Intelligence,data science and big data processing			2	4	36	144	51.2	92.8	0.2										4	16	16	16	3	92.8	0.2																		2
+	Б1.В.06	SKADA for AI systems			3	5	36	180	55.2	124.8	0.2																		5	16	16	16	7	124.8	0.2										2
+	Б1.В.07	Fundamentals of DSS development in Python			2	5	36	180	56.2	123.8	0.2										5	16	16	16	8	123.8	0.2																		2
+	**Б1.В.ДВ.01**	**Elective courses Б1.В.ДВ.1**	**3**		**2**	**10**		**360**	**99.5**	**224.8**	**0.5**	**35.7**									**5**	**10**		**30**	**8**	**131.8**	**0.2**		**5**			**48**	**3**	**93**	**0.3**	**35.7**									
+	Б1.В.ДВ.01.01	Fundamentals of industrial networks	3		2	10	36	360	99.5	224.8	0.5	35.7									5	10		30	8	131.8	0.2		5			48	3	93	0.3	35.7									2
-	Б1.В.ДВ.01.02	Simulation modeling of control systems electronic devices	3		2	10	36	360	99.5	224.8	0.5	35.7									5	10		30	8	131.8	0.2		5			48	3	93	0.3	35.7									2
+	**Б1.В.ДВ.02**	**Elective courses Б1.В.ДВ.2**		**3**		**4**		**144**	**35.2**	**108.8**	**0.2**																		**4**			**32**	**3**	**108.8**	**0.2**									
+	Б1.В.ДВ.02.01	Real time operation systems		3		4	36	144	35.2	108.8	0.2																		4			32	3	108.8	0.2									2
-	Б1.В.ДВ.02.02	Vx Works		3		4	36	144	35.2	108.8	0.2																		4			32	3	108.8	0.2									2
Unit 2. Placement						21		756	13	743	1		3			4		103.8	0.2		3			4		103.8	0.2		3			4		103.8	0.2		12					431.6	0.4		
Compulsory						9		324	12.6	311.4	0.6		3			4		103.8	0.2		3			4		103.8	0.2		3			4		103.8	0.2										
+	**Б2.О.01**	**Study placement**			**123**	**9**		**324**	**12.6**	**311.4**	**0.6**		**3**			**4**		**103.8**	**0.2**		**3**			**4**		**103.8**	**0.2**		**3**			**4**		**103.8**	**0.2**										
+	Б2.О.01.01(Н)	Research work			123	9	36	324	12.6	311.4	0.6		3			4		103.8	0.2		3			4		103.8	0.2		3			4		103.8	0.2										2
Institutional						12		432	0.4	431.6	0.4																										12					431.6	0.4		
+	**Б2.В.01**	**Industrial placement**			**44**	**12**		**432**	**0.4**	**431.6**	**0.4**																										**12**					**431.6**	**0.4**		
+	Б2.В.01.01(П)	Tehnological (project) practical training			44	6	36	216	0.2	215.8	0.2																										6					215.8	0.2		2
+	Б2.В.01.02(Па)	Pre-diploma placement incl. research work			44	6	36	216	0.2	215.8	0.2																										6					215.8	0.2		2
Unit 3. Final state attestation						9		324	0.25	323.75	0.25																										9					323.75	0.25		
+	Б3.01(Д)	Preparation for the defense procedure and defense of the final qualification work	4			9	36	324	0.25	323.75	0.25																										9					323.75	0.25		2
Optional courses						5		180	64.4	115.6	0.4		3	16		16		75.8	0.2		2	16		16		39.8	0.2																		
+	ФТД.01	Innovation economy		1		3	36	108	32.2	75.8	0.2		3	16		16		75.8	0.2																										37
+	ФТД.02	Fundamentals of Technology Entrepreneurship			2	2	36	72	32.2	39.8	0.2										2	16		16		39.8	0.2																		37