

Institute of Mechanical Engineering, Materials Science & Transport

Master Program: Mechanical Engineering

Field of Studies: "New materials and strengthening technologies in mechanical engineering"

Years of studies: 2

Language of instruction: Russian

№	Subject	Hours	Credits
	Compulsory courses Block1		
	Block 1 Disciplines (modules)		
1	Compulsory part of Block 1		
1.1	Foreign language for academic purposes	72	2
1.2	Commercialisation of knowledge-intensive technologies and synthesis of solutions in engineering	108	3
1.3	Management and marketing	72	2
1.4	Philosophy of science	108	3
1.5	New Construction Materials	180	5
1.6	Computer technology in engineering	144	4
1.7	Basics of research, experiment organisation and planning	144	4
1.8	Nanomaterials and nanotechnologies in mechanical engineering	216	6
1.9	Thin-film technologies in strengthening mechanical engineering	108	3
1.10	Mathematical Methods in Engineering	180	5
1.11	Technology entrepreneurship	72	2
1.12	Additive materials, technologies and equipment	144	4
1.13	TOTAL compulsory part	1548	
1.14	Block 1 Variative		
1.15	Language of business communication	108	3
1.16	Mathematical models of dynamic processes	216	6
1.17	Electrophysical technologies and equipment	108	3

	for modification and processing of structural materials		
1.18	Processes and equipment for hardening heat treatment of metal materials for various applications	180	5
1.19	Qualitative and quantitative analysis of structural materials properties	108	3
1.20	Scientific fundamentals of powder fabrication methods.	144	4
1.21	Elective disciplines	504	14
1.22	Fundamentals of Processing of Observations in Mechanical Engineering	108	3
1.23	Modelling techniques for hardening processes in mechanical engineering	/108	3
1.24	Advanced Hardening	180	5
1.25	Technologies of Structural Materials	/180	5
1.26	Modifying metals and alloys by laser and electrospark treatment	/180	5
1.27	Functional coatings for mechanical engineering	216	6
1.28	Total for the variative block	1368	38
	Total for Block 1	2916	81
	Block 2 Practice	1080	30
	Compulsory part of block 2	540	15
2.1	Educational (demonstrative) internship	216	6
2.2	Research work	324	
2.3	Varianative part of Block 2	540	15
2.4	Industrial (pre-diploma) internship	540	15
	Block 3 State Final Attestation		
3.1	State Final Evaluation	216	6
3.2	Preparation for defence and defence of Master's and PhD theses.	324	9
3.3	Total by direction	4320	120
3.4	Elective courses		
3.5	Methods of producing nanoparticles, their	108	16

	properties and specific applications		
3.6	Research methods for investigating the performance of engineering products	108	16