

Advanced Materials Science
PROGRAM STRUCTURE (Curriculum)

Total: 120 ECTS				
40 ECTS	Core and required courses		25 ECTS	Elective courses
30 ECTS	Internships and industrial placement		25 ECTS	Research and Ms Thesis project
First year	First semester			28 ECTS
	Foreign Language (English / Russian)			5
	Management of Quality			3
	Project Management			3
	Thermodynamics and Kinetics in Materials Science			5
	New methods for Studying Mechanical Properties and Standards	Material Selection	Modern Methods of Structural Characterisation of Micro- and Nano-Systems	3
	Internship			4
	Research			5
	Second semester			32 ECTS
	Foreign Language (English / Russian)			5
	Metallic Materials: Structure, Properties and Application			5
	Development of Metallic Materials			5
	Modern Equipment and Techniques for Investigation of Structure and Properties of Metallic Alloys	SHS Process as a Basis of Synthesis of Inorganic Materials	Methods of Surfaces and Interfaces Investigation	5
	Magnetic Materials	Diffusion in Solids	Nanofilms: Fundamental Principles, Characterization, Testing, and Application. Methods of Contact and Non-Contact Characterization of Surface Topography	4
	Research			3
Industrial placement			5	

Second year	Third semester			30 ECTS
	Modelling and Optimization in Physical Metallurgy			5
	Thermal and Thermomechanical Treatment of Special Steels and Alloys			4
	Thermodynamic Computation and Analysis of Phase Diagrams of Multicomponent Systems		Advanced Methods of Coatings and Nanofilms Deposition	5
	Biomaterials for Medical Devices	Amorphous Metallic Alloys	Disperse-Strengthened by Nanoparticles Tribological Coatings. Nanofilms for Mechanical Engineering and Medicine	4
	Corrosion and Protection of the Metallic Materials	Friction and Wear of Coatings	Advanced Technologies of the Metallic Materials Production	4
	Research			8
	Fourth semester			30 ECTS
	Industrial placement			21
	State final attestation (incl. Ms Thesis defense)			9