

Документ подписан простой электронной подписью  
 Информация о владельце:  
 ФИО: Ливанов Дмитрий Викторович  
 Должность: Ректор  
 Дата подписания: 17.05.2023 17:57:15  
 Уникальный программный ключ:  
 Vice Rector for Academic Affairs  
 c6d909c49c1d2154fa5a0156c4eaa51e7252a3a2  
 A. A. Voronov

Ministry of Science and Higher Education of the Russian Federation  
 The Federal State Autonomous Educational Institution of Higher Education  
 "Moscow Institute of Physics and Technology (National Research University)"

### ACADEMIC PLAN

Qualification Master

Year of enrollment 2022

Statutory duration of a study course 2 years

Domain of study: 19.04.01 - Biotechnology  
 Orientation (specialty): Medical Biotechnology/Медицинская биотехнология  
 Phystech School of Biological and Medical Physics  
 Center for educational programs in bioinformatics

**AGREED**  
 Head of the Phystech School of Biological and Medical  
 Physics

№ in order	Name of disciplines, practices, State Final Examination	Form of final control by semesters						Hours						Coursework and test papers	hours in week								TOTAL HOURS	Credit points									
		Examination			Graded test ("-" - simple)			Laboratory classes	of them				Hours for preparation and examinations		Distribution by courses and semesters									Total	Basic	Elective							
		1	2	3	4	1	2		3	4	Total classroom sessions	Lectons			Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	1 course								2 course						
																			lect	lab	sem	lect					lab	sem	lect	lab	sem	lect	lab
		3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20	21	22											
M.1	<b>Courses (Modules)/Дисциплины (модули)</b>							2 505	1 035	525	150	360		1 470	330	12													2 835	63	11	52	
M.1.1	<b>Foreign Languages/Иностранные языки</b>							180	120			120		60		4													180	4	4		
								90	60			60		30		2			4									90	2	2			
								90	60			60		30		2					4							90	2	2			
	<b>Humanitarian and Social Cycle/Гуманитарный и социальный цикл</b>							165	60	60				105	60	4												225	5	5			
M.1.2	Populism, Fakes, and Post-Truth: Algorithm-Driven Media Consumption and New Social Phenome/Популизм, фейки и постправда: алгоритмизированное медиапотребление и новые социальные феномены	1						60	30	30				30	30	2	2											90	2	2			
M.1.3	Digital Transformation: Social and Economic Challenges/Цифровая трансформация: социальные и экономические вызовы		2					105	30	30				75	30	2				2								135	3	3			
	<b>Core science/Профильные дисциплины</b>							2 160	855	465	150	240		1 305	270	4												2 430	54	2	52		
M.1.B.1	Theory of Probability/Теория вероятностей							270	120	60		60		150														270	6		6		
								135	60	30		30		75						2		2						135	3		3		
								135	60	30		30		75						2		2						135	3		3		
M.1.4	Algorithms of Bioinformatics/Алгоритмы биоинформатики							90	45	30		15		45									2		1			90	2	2			
M.1.B.2	Basic Biostatistics/Базовая биостатистика			3				60	30			30		30	30										2			90	2		2		
M.1.B.3	Introduction to Molecular Biology and Genetics/Введение в молекулярную биологию и генетику	1						105	30	30				75	30					2								135	3		3		
M.1.B.4	Python Programming/Программирование на языке Python							285	120	60	60			165	30	4				2								315	7		7		
								135	45	15	30			90		2				1	2							135	3		3		
								150	75	45	30			75	30	2						3	2					180	4		4		
M.1.B.5	Genetic and Genomic Engineering/Генная и геномная инженерия							90	15			15		75														90	2		2		
M.1.B.6	Statistics/Статистика							90	45	30		15		45												2	1		90	2		2	
M.1.B.7	Molecular Mechanisms of Cell Death/Молекулярные механизмы клеточной гибели							90	30	30				60								2						90	2		2		
M.1.B.8	Cell Technology/Клеточные технологии							180	90	30	60			90						2	4							180	4		4		
M.1.B.9	Molecular and Cell Biology/Молекулярная и клеточная биология	1						105	30			30		75	30							2						135	3		3		
M.1.B.10	Introduction to Cancer Biology/Основы биологии рака							105	15			15		90	30												1		135	3		3	
M.1.B.11	Medicinal Chemistry: fundamental concepts and modern approaches/Медицинская химия: фундаментальные концепции и современные подходы							150	60	60				90	30														180	4		4	
								90	30	30				60													2		90	2		2	
								60	30	30				30	30													2		90	2		2

№ in order	Name of disciplines, practices, State Final Examination	Form of final control by semesters				Hours										Coursework and test papers	hours in week								TOTAL HOURS	Credit points		
		Examination		Graded test ("-" - simple)		State Examination	Laboratory classes	of them						Hours for preparation and examinations	Distribution by courses and semesters								Total	Basic		Elective		
								Laboratory classes	Total classroom sessions	Lectures	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice		Independent study		1 course				2 course							
						1 sem. 15 weeks								2 sem. 15 weeks			3 sem. 15 weeks		4 sem. 15 weeks									
		1	2	3	4	1	2							3			4	1	2	3	4	lect	lab	sem		lect	lab	sem
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22							
M.1.B.12	Microbiology and Metagenomics/Микробиология и метабеномтика															2							90	2		2		
M.1.B.13	Physico-chemical Biology of Proteins: from Structure to Function and Biomedical Application/Физико-химическая биология белков: от структуры к функции и биомедицинскому применению		2								60												135	3		3		
M.1.B.14	Bioorganic Chemistry/Биоорганическая химия	1				195	90	30		30		105	30		2	2	2						225	5		5		
M.1.B.15	Immunology/Иммунология					105	60	60				45	30										135	3		3		
						45	30	30				15							2				45	1		1		
			4			60	30	30				30	30							2			90	2		2		
	<b>Elective Set of Courses 1/Блок дисциплин по выбору 1</b>					45	15	15				30											45	1		1		
M.1.B.16	Tissue Engineering/Тканевая инженерия					45	15	15				30				1							45	1		1		
M.1.B.17	Neurophysiology and Cognitive Sciences/Нейрофизиологию и когнитивные науки					45	15					30											45	1		1		
M.2	<b>Practice/Практика</b>					2 295						2 295											2 295	51		51		
M.2.1	<b>Industrial Practice/Производственные практики</b>					2 295						2 295											2 295	51		51		
M.2.1.1	Personal Research Project/Научно-исследовательская работа					2 295						2 295											2 295	51		51		
						1 125						1 125											1 125	25		25		
						1 170						1 170											1 170	26		26		
M.3	<b>State Final Certification/Государственная итоговая аттестация</b>					240						240	30										270	6		6		
M.3.1	Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы											240	30										270	6		6		
TOTAL:		<b>Number of examinations and pass/fail tests</b>				Obl. ECs.	<b>Distribution of hours by type of lesson</b>							<b>Distribution of classroom hours per week by semester</b>				<b>Total hours</b>	<b>Total number of credits</b>									
		Examinations		Pass/Fail tests			Laboratory classes		Total classroom sessions	Lectures	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	Hours for preparation and examinations	lect	lab	sem	lect	lab	sem							
	Fixed (without State Final Examination)	4	4	1	2		4	6	5	1	5 040	1 035	525	150	360	2 295	1 710	360	29	24	12	4	5 400	120	68	52		
	Extracurriculars																											
State Final Examination				1																								
							<b>Distribution of hours of contact work by years and semesters</b>											<b>Total hours</b>										
							<b>889</b>							<b>338</b>				<b>1 227</b>										
							479							410					228				110					
							<b>Distribution of credits by years and semesters</b>																					
							<b>50</b>							<b>70</b>														
							25							25				34				36						

Head of Educational Department I. R. Garayshina