Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ливанов Дмитрий Викторович
Должность: Ректор
Дата подписания: 23.03.2026 18:18:12
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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 Bachelor
Year of enrollment 2022
Statutory duration of a study course 4 years

APPROVED
Vice Rector for Academic Affairs

L.S. A. A. Voronov

Domain of study: 19.03.01 - Biotechnology
Orientation (specialty): Biomedical Engineering/Биомедицинская инженерия
Phystech School of Biological and Medical Physics
Center for educational programs in bioinformatics

AGREED
Head of the Phystech School of Biological and Medical Physics

D. V. Kuzmin

№ in order (1)	Name of disciplines, practices, State Final Examination (2)	Form of final control by semesters (3): Examinations, sem. 1	2	3	4	5	6	7	8	Graded test ("-" - simple) (4), sem. 1	2	3	4	5	6	7	8	State Examination (5)	Hours: Total for education (6)	of them: Total classroom sessions (7)	Lections (8)	Laboratory classes (9)	Practical lessons, seminars, exercises, etc. (10)	Practice (11)	Independent study (12)	Hours for preparation and examinations (13)	Coursework and test papers (14)	TOTAL HOURS (23)	Credit points: Total (24)	Basic (25)	Elective (26)
Б.1	**Courses (Modules)/Дисциплины (модули)**																		7 920	4 095	1 230	930	1 935		3 825	780	68	8 700	186	95	91
Б.1.1	History/История									1									45	30	30				15			45	1	1	
Б.1.2	Philosophy/Философия																8		90	30	30				60			90	2	2	
Б.1.3	**Foreign Languages/Иностранные языки**																		765	480			480		285		16	765	17	17	
										-1									90	60			60		30		2	90	2	2	
											2								90	60			60		30		2	90	2	2	
												-3							90	60			60		30		2	90	2	2	
													4						90	60			60		30		2	90	2	2	
														-5					90	60			60		30		2	90	2	2	
															6				90	60			60		30		2	90	2	2	
																-7			90	60			60		30		2	90	2	2	
																	8		135	60			60		75		2	135	3	3	
	Mathematics/Математика																		2 265	1 020	495		525		1 245	300	20	2 565	57	42	15
Б.1.В.1	Introduction to Mathematical Analysis/Введение в математический анализ	1																	195	90	30		60		105	30	5	225	5		5
Б.1.В.2	Mathematical Analysis – Functions of One Variable/Математический анализ – функции одной переменной		2																240	120	60		60		120	30	3	270	6		6
Б.1.4	Mathematical Analysis – Sequences and Series of Functions, Functions of Several Variables/Математический анализ – функциональные последовательности и ряды, функции нескольких переменных			3															240	120	60		60		120	30		270	6	6	
Б.1.5	Multiple Integrals and Field Theory/Кратные интегралы и теория поля				4														150	60	30		30		90	30		180	4	4	
Б.1.В.3	Fourier Analysis/Фурье анализ					5													150	60	30		30		90	30		180	4		4
Б.1.6	Geometry/Геометрия	1																	150	60	30		30		90	30		180	4	4	
Б.1.7	Analytic Geometry/Аналитическая геометрия		2																150	60	30		30		90	30	3	180	4	4	
Б.1.8	Linear Algebra/Линейная алгебра			3															150	60	30		30		90	30		180	4	4	
Б.1.9	Ordinary Differential Equations/Дифференциальные уравнения																		285	120	60		60		165	30	4	315	7	7	
													4						135	60	30		30		75		2	135	3	3	
																			150	60	30		30		90	30	2	180	4	4	

Hours in week – Distribution by courses and semesters

№ in order	1 course, 1 sem. 15 weeks (15): lec	lab	sem	2 sem. 15 weeks (16): lec	lab	sem	2 course, 3 sem. 15 weeks (17): lec	lab	sem	4 sem. 15 weeks (18): lec	lab	sem	3 course, 5 sem. 15 weeks (19): lec	lab	sem	6 sem. 15 weeks (20): lec	lab	sem	4 course, 7 sem. 15 weeks (21): lec	lab	sem	8 sem. 15 weeks (22): lec	lab	sem
Б.1																								
Б.1.1	2																							
Б.1.2																						2		
Б.1.3																								
			4																					
						4																		
									4															
												4												
															4									
																		4						
																					4			
																								4
Б.1.В.1	2		4																					
Б.1.В.2				4		4																		
Б.1.4							4		4															
Б.1.5										2		2												
Б.1.В.3													2		2									
Б.1.6	2		2																					
Б.1.7				2		2																		
Б.1.8							2		2															
Б.1.9																								
										2		2												
													2		2									

№ in order	Name of disciplines, practices, State Final Examination	Form of final control by semesters: Examinations 1	2	3	4	5	6	7	8	Graded test ("-" - simple) 1	2	3	4	5	6	7	8	State Examination	Hours: Total for education	of them: Total classroom sessions	Lections	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	Hours for preparation and examinations	Coursework and test papers	hours in week: 1 course 1 sem. 15 weeks lec	lab	sem	2 sem. 15 weeks lec	lab	sem	2 course 3 sem. 15 weeks lec	lab	sem	4 sem. 15 weeks lec	lab	sem	3 course 5 sem. 15 weeks lec	lab	sem	6 sem. 15 weeks lec	lab	sem	4 course 7 sem. 15 weeks lec	lab	sem	8 sem. 15 weeks lec	lab	sem	TOTAL HOURS	Credit points: Total	Basic	Elective
1	2	3								4								5	6	7	8	9	10	11	12	13	14	15			16			17			18			19			20			21			22			23	24	25	26
Б.1.10	Partial Differential Equations/Уравнения математической физики														6				135	60	30		30		75		2																2		2							135	3	3	
Б.1.11	Probability Theory/Теория вероятностей																		270	120	60		60		150																											270	6	6	
													4						135	60	30		30		75												2		2													135	3	3	
														5					135	60	30		30		75															2		2										135	3	3	
Б.1.12	Functions of One Complex Variable/Теория функций комплексного переменного						6												150	90	45		45		60	30	3																3		3							180	4	4	
	Physics/Физика																		**1 350**	**690**	**210**	**300**	**180**		**660**	**180**	**8**																									1 530	34	4	30
Б.1.13	General Physics: Introduction to Physics/Общая физика: введение в физику	1																	150	90	60		30		60	30	2	4		2																						180	4	4	
Б.1.В.4	General Physics: Mechanics/Общая физика: механика		2																105	60	30		30		45	30	2				2		2																			135	3		3
Б.1.В.5	General Physics: Thermodynamics and Molecular Physics/Общая физика: термодинамика и молекулярная физика			3															105	60	30		30		45	30								2		2																135	3		3
Б.1.В.6	General Physics: Electricity and Magnetism/Общая физика: электричество и магнетизм				4														105	60	30		30		45	30											2		2													135	3		3
Б.1.В.7	General Physics: Optics/Общая физика: оптика					5													105	60	30		30		45	30	2													2		2										135	3		3
Б.1.В.8	General Physics: Quantum Physics/Общая физика: квантовая физика						6												105	60	30		30		45	30	2																2		2							135	3		3
Б.1.В.9	General Physics: Laboratory Practicum/Общая физика: лабораторный практикум																		675	300		300			375																											675	15		15
											2								135	60		60			75							4																				135	3		3
												3							135	60		60			75										4																	135	3		3
													4						135	60		60			75													4														135	3		3
														5					135	60		60			75																4											135	3		3
															6				135	60		60			75																			4								135	3		3
Б.1.14	Fundamentals of Financial and Economic Analysis and Planning/Основы финансово-экономического анализа и планирования																-8		45	15	15				30																								1			45	1	1	
Б.1.15	Life Safety/Безопасность жизнедеятельности									1									45	30	30				15		2	2																								45	1	1	
Б.1.16	Health Concepts & Strategies/Физическая культура									-1									90	60			60		30					4																						90	2	2	
Б.1.17	Applied Physical Education (Optional Sports)/Прикладная физическая культура (виды спорта по выбору)										-2	-3	-4	-5	-6				330	300			300		30								4			4			4			4			4							330			
	Informatics/Информатика																		**540**	**180**		**150**	**30**		**360**		**12**																									540	12	2	10
Б.1.В.10	Foundations of Programming I/Основы программирования I									1									180	60		60			120		4		4																							180	4		4
Б.1.В.11	Foundations of Programming II/Основы программирования II										2								180	60		60			120		4					4																				180	4		4
Б.1.18	Python Programming/Программирование на языке Python											3							90	30		30			60		4								2																	90	2	2	
Б.1.В.12	Biostatistics/Биостатистика															7			90	30			30		60																						2					90	2		2
	Department Courses/Факультетские дисциплины																		**1 545**	**900**	**300**	**480**	**120**		**645**	**210**	**10**																									1 755	39	23	16
	Chemistry/Химия																		**435**	**240**	**60**	**120**	**60**		**195**	**60**	**6**																									495	11	11	

№ in order	Name of disciplines, practices, State Final Examination	Form of final control by semesters																State Examination	Hours								Coursework and test papers	hours in week																				TOTAL HOURS	Credit points		
		Examinations								Graded test ("-" - simple)									Total for education	of them						Hours for preparation and examinations		Distribution by courses and semesters																											
																				Total classroom sessions	Lections	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study			1 course				2 course				3 course				4 course																					
																												1 sem. 15 weeks			2 sem. 15 weeks			3 sem. 15 weeks			4 sem. 15 weeks			5 sem. 15 weeks			6 sem. 15 weeks			7 sem. 15 weeks			8 sem. 15 weeks								
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8											lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser						
1	2	3								4								5	6	7	8	9	10	11	12	13	14	15			16			17			18			19			20			21			22			23	24	25	26
Б.1.19	General Chemistry/Общая химия			3								3							195	120	30	60	30		75	30	2							2	4	2																225	5	5	
Б.1.20	Organic Chemistry/Органическая химия				4								4						240	120	30	60	30		120	30	4										2	4	2														270	6	6	
	Biology/Биология																		1 110	660	240	360	60		450	150	4																										1 260	28	12	16
Б.1.21	General Biology/Общая биология																		195	120	60	60			75	30	4																										225	5	5	
												3							90	60	30	30			30		2							2	2																	90	2	2	
					4								-4						105	60	30	30			45	30	2										2	2														135	3	3	
Б.1.22	Fundamentals of Cellular Biotechnology/Основы клеточных биотехнологий																		285	180	60	120			105	30																											315	7	7	
														5					135	90	30	60			45														2	4											135	3	3	
							6												150	90	30	60			60	30																2	4								180	4	4	
Б.1.В.13	Developmental Biology/Биология развития							7											195	120	30	60	30		75	30																			2	4	2						225	5		5
Б.1.В.14	General Genetics/Общая генетика								8										195	120	30	60	30		75	30																						2	4	2	225	5		5
Б.1.В.15	Bioorganic Chemistry/Биоорганическая химия																		240	120	60	60			120	30																											270	6		6
															6				45	30	30				15																										45	1		1
								7								-7			195	90	30	60			105	30																			2	4						225	5		5
Б.1.В.16	Molecular Biology/Молекулярная биология																		180	90			90		90																											180	4		4
														-5					90	30			30		60																											90	2		2
															6				90	60			60		30																											90	2		2
Б.1.В.17	Fundamentals of Toxicology/Основы токсикологии													5					90	60	30		30		30																												90	2		2
Б.1.В.18	Immunology/Иммунология														6				90	30	30				60																												90	2		2
	Core science/Профильные дисциплины																		450	180	60		120		270	90																												540	12		12
Б.1.В.19	Physiology/Физиология															7			90	30	30				60																			2									90	2		2
Б.1.В.20	Evolutionary Biology/Эволюционная биология								8										60	30	30				30	30																					2						90	2		2
Б.1.В.21	Microbiology/Микробиология							7											150	60			60		90	30																				4						180	4		4
Б.1.В.22	Pathophysiology/Патофизиология								8										105	30			30		75	30																									2		135	3		3
	Elective Set of Courses 1/Блок дисциплин по выбору 1																		45	30			30		15																												45	1		1
Б.1.В.23	Virology/Вирусология																8		45	30					15																												45	1		1
Б.1.В.24	Bioinformatics&System Biology/Биоинформатика и системная биология																	8	45	30			30		15																										2		45	1		1
Б.2	**Practice/Практика**																		2 160					2 160																												2 160	48	21	27
Б.2.1	**Industrial Practice/Производственная практика**																		945					945																													945	21	21	
Б.2.1.1	Personal Research Project/Научно-исследовательская работа																		945					945																													945	21	21	
																7			495					495																												495	11	11	
																	8		450					450																												450	10	10	
Б.2.2	**Educational Practice/Учебная практика**																		1 215					1 215																												1 215	27		27
Б.2.2.В.1	Research Practice/Научно-исследовательская практика										-2								405					405																												405	9		9
Б.2.2.В.2	Project Session/Проектная сессия												-4						360					360																												360	8		8
Б.2.2.В.3	Laboratory Safety and Biological Workshop/Лабораторная безопасность и биологический практикум														-6				450					450																												450	10		10

№ in order	Name of disciplines, practices, State Final Examination	Form of final control by semesters															Hours								Coursework and test papers	h o u r s i n w e e k								TOTAL HOURS	Credit points		
		Examinations								Graded test ("-" - simple)								State Examination	Total for education	of them								Distribution by courses and semesters											
																										1 course		2 course		3 course		4 course					
																										1 sem. 15 weeks	2 sem. 15 weeks	3 sem. 15 weeks	4 sem. 15 weeks	5 sem. 15 weeks	6 sem. 15 weeks	7 sem. 15 weeks	8 sem. 15 weeks				
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8			Total classroom sessions	Lections	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	Hours for preparation and examinations		lec lab ser	lec lab ser	lec lab ser	lec lab ser	lec lab ser	lec lab ser	lec lab ser	lec lab ser		Total	Basic	Elective
1	2	3								4								5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Б.3	**State Final Certification/Государственная итоговая аттестация**																		**240**						**240**	**30**										270	6	6	
Б.3.1	Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы								8									8	**240**						**240**	**30**										270	6	6	

TOTAL:		Number of examinations and pass/fail tests															Distribution of hours by type of lesson								Distribution of classroom hours per week by semester								Total hours	Total number of credits		
		Examinations								Pass/Fail tests																												
	Fixed (wtihout State Final Examination)	3	3	4	4	3	3	3	3	4	4	5	7	6	7	5	5	Obl.	10 320	4 095	1 230	930	1 935	2 160	4 065	810	68	28	28	38	36	36	36	26	21	11 130	240	122	118
	Physical education									1	1	1	1	1	1			ECs.																				
	Extracurriculars																											Distribution of hours of contact work by years and semesters								Total hours			
	State Final Examination								1																			1 047		1 328		1 297		817		4 489			
																												525	522	676	652	644	653	439	378				
																												Distribution of credits by years and semesters											
																												54		62		60		64					
																												23	31	27	35	26	34	31	33				

Head of Academic Management Office **I. R. Garayshina**