

Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ливанов Дмитрий Викторович
Должность: Ректор
Дата подписания: 28.07.2025 10:18:01
Уникальный программный ключ:
c6d909c49c1d2024fa3a9016c44aa51e7232a3a
APPROVED
Vice Rector for Academic Affairs
Domain:
Orientation:

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 2025

Statutory duration of a study course 4 years

AGREED

Head of the Phystech School of Biological and Medical Physics

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

D. V. Kuzmin

№ 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				
																	of them															Distribution by courses and semesters						
		Examinations								Graded test ("-" - simple)																						State Examination		Total for education	Total classroom sessions	Lectons	Laboratory classes	Practical lessons, seminars, exercises, etc.
																	1	2	3	4	5	6	7		8	1	2	3	4	5	6							
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
	Courses (Modules)/Дисциплины (модули)																8 025	4 125	1 275	930	1 920		3 900	810	76									8 835	189	97	92	
Б.1.1	History of Russia: History and Philosophy of Science and Technology/История России: История и философия науки и технологий																180	60	60				120		6									180	4	4		
														7			90	30	30				60		3						2			90	2	2		
															8		90	30	30				60		3							2			90	2	2	
Б.1.2	Foreign Languages/Иностранные языки																735	480			480		255	30	16									765	17	17		
									-1								90	60			60		30		2		4								90	2	2	
									2								90	60			60		30		2				4						90	2	2	
										-3							90	60			60		30		2				4						90	2	2	
										4							90	60			60		30		2					4					90	2	2	
											-5						90	60			60		30		2					4					90	2	2	
												6					90	60			60		30		2						4				90	2	2	
													-7				90	60			60		30		2						4				90	2	2	
							8										105	60			60		45	30	2							4	135	3	3			
	Mathematics/Математика																2 265	1 020	495		525		1 245	300	20								2 565	57	42	15		
Б.1.B.1	Introduction to Mathematical Analysis/Введение в математический анализ	1															195	90	30		60		105	30	5	2	4							225	5	5		
Б.1.B.2	Mathematical Analysis – Functions of One Variable/Математический анализ – функции одной переменной	2															240	120	60		60		120	30	3		4	4						270	6	6		
Б.1.3	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					4	4				270	6	6		
Б.1.4	Multiple Integrals and Field Theory/Кратные интегралы и теория поля			4													150	60	30		30		90	30						2	2			180	4	4		
Б.1.B.3	Fourier Analysis/Фурье анализ				5												150	60	30		30		90	30							2	2			180	4	4	
Б.1.5	Geometry/Геометрия	1															150	60	30		30		90	30		2	2							180	4	4		
Б.1.6	Analytic Geometry/Аналитическая геометрия		2														150	60	30		30		90	30	3			2	2					180	4	4		
Б.1.7	Linear Algebra/Линейная алгебра			3													150	60	30		30		90	30				2	2					180	4	4		

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													of them												Distribution by courses and semesters																	Total	Basic	Elective				
		Examinations								Graded test ("-" - simple)								State Examination	Total for education	Total classroom sessions	Lectons	Laboratory classes	Practical lessons, seminars, exercises, etc.		Practice	Independent study	Hours for preparation and examinations																					
																												1 course				2 course				3 course				4 course								
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8											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 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	
		lec	lab	se	lec	lab	se	lec	lab	se	lec	lab	se	lec	lab	se	lec											lab	se	lec	lab	se	lec	lab	se	lec	lab	se	lec	lab					se	lec	lab	se
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									
B.1.8	Ordinary Differential Equations/Дифференциальные уравнения																		285	120	60					60			165	30	4									315	7	7						
											4								135	60	30					30			75			2			2						135	3	3					
					5														150	60	30					30			90	30	2						2					180	4	4				
B.1.9	Partial Differential Equations/Уравнения математической физики																																								135	3	3					
B.1.10	Probability Theory/Теория вероятностей																																									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				
B.1.11	Functions of One Complex Variable/Теория функций комплексного переменного																		150	90	45					45			60	30	3											180	4	4				
	Physics/Физика																		1 350	690	210	300	180					660	180	8												1 530	34	4	30			
B.1.12	General Physics: Introduction to Physics/Общая физика: введение в физику	1																	150	90	60					30			60	30	2	4	2										180	4	4			
B.1.B.4	General Physics: Mechanics/Общая физика: механика		2																105	60	30					30			45	30	2			2	2								135	3		3		
B.1.B.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		
B.1.B.6	General Physics: Electricity and Magnetism/Общая физика: электричество и магнетизм				4														105	60	30					30			45	30						2	2						135	3		3		
B.1.B.7	General Physics: Optics/Общая физика: оптика					5													105	60	30					30			45	30	2						2	2						135	3		3	
B.1.B.8	General Physics: Quantum Physics/Общая физика: квантовая физика						6												105	60	30					30			45	30	2								2	2					135	3		3
B.1.B.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	
B.1.13	Fundamentals of Financial and Economic Analysis and Planning/Основы финансово-экономического анализа и планирования																		45	15	15							30															45	1	1			
B.1.14	Life Safety/Безопасность жизнедеятельности										1								90	30	30							60				2	2										90	2	2			
B.1.15	Health Concepts & Strategies/Физическая культура										-1								90	60						60	30						4									90	2	2				
B.1.16	Applied Physical Education (Optional Sports)/Прикладная физическая культура (виды спорта по выбору)											-2	-3	-4	-5	-6			330	300						300	30								4			4		4				330				
	Informatics/Информатика																		540	180		150	30				360			12													540	12	2	10		
B.1.B.10	Foundations of Programming I/Основы программирования I										1								180	60		60					120		4			4											180	4		4		
B.1.B.11	Foundations of Programming II/Основы программирования II											2							180	60		60					120		4					4									180	4		4		

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													of them											Distribution by courses and semesters																TOTAL HOURS	Total	Basic	Elective						
		Examinations								Graded test ("-" - simple)								Total for education	Total classroom sessions	Lectures	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	Hours for preparation and examinations	Coursework and test papers	1 course				2 course				3 course				4 course										
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8										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															
		lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser	lec										lec	lab	ser	lec	lab	ser	lec	lab	ser	lec	lab	ser											
1	2	3								4								6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26											
Б.1.17	Python Programming/Программирование на языке Python										3							90	30		30			60		4				2							90	2	2										
Б.1.B.12	Biostatistics/Биостатистика															7		90	30			30		60									2			90	2		2										
	Department Courses/Факультетские дисциплины																	1 950	1 110	405	480	225		840	210	12										2 160	48	23	25										
	Chemistry/Химия																	435	240	60	120	60		195	60	6										495	11	11											
Б.1.18	General Chemistry/Общая химия		3								3							195	120	30	60	30		75	30	2				2	4	2						225	5	5									
Б.1.19	Organic Chemistry/Органическая химия			4								4						240	120	30	60	30			120	30	4				2	4	2					270	6	6									
	Biology/Биология																	1 515	870	345	360	165		645	150	6										1 665	37	12	25										
Б.1.B.13	Introduction to Biology/Введение в биологию										2							45	30	15		15		15		2		1	1								45	1		1									
Б.1.20	General Biology/Общая биология											3						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.1.21	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.B.14	Bioorganic Chemistry/Биоорганическая химия												6					240	120	60	60			120	30											270	6		6										
														6				45	30	30				15							2				45	1		1											
							7									-7		195	90	30	60			105	30										2		225	5		5									
Б.1.B.15	Developmental Biology/Биология развития						7											195	120	30	60	30		75	30									2	4	2	225	5		5									
Б.1.B.16	General Genetics/Общая генетика							8										195	120	30	60	30		75	30									2	4	2	225	5		5									
Б.1.B.17	Molecular Biology/Молекулярная биология																	180	90	30		60		90												180	4		4										
														-5				90	30			30		60								2				90	2		2										
															6			90	60	30		30		30								2	2			90	2		2										
Б.1.B.18	Immunology/Иммунология														6			90	30	30				60									2			90	2		2										
Б.1.B.19	Fundamentals of Toxicology/Основы токсикологии											5						90	60	30		30		30						2	2					90	2		2										
	Core science/Профильные дисциплины																	450	180	60		120		270	90											540	12		12										
Б.1.B.20	Physiology/Физиология											7						90	30	30				60										2		90	2		2										
Б.1.B.21	Evolutionary Biology/Эволюционная биология							8										60	30	30				30	30										2		90	2		2									
Б.1.B.22	Microbiology/Микробиология						7											150	60			60		90	30									4		180	4		4										
Б.1.B.23	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.B.24	Virology/Вирусология															8		45	30					15												45	1		1										
	Bioinformatics&System Biology/Биоинформатика и системная биология																8					30		15												2	45	1		1									
Б.1.B.25																		45	30			30		15																									
Б.2	Practice/Практика																	2 025					2 025													2 025	45	18	27										
Б.2.1	Industrial Practice/Производственная практика																	810					810													810	18		18										
Б.2.1.1	Personal Research Project/Научно-исследовательская работа																	810					810													810	18		18										
																	7	405					405													405	9		9										
																	8	405					405													405	9		9										
Б.2.2	Educational Practice/Учебная практика																	1 215					1 215													1 215	27		27										

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														of them													Distribution by courses and semesters																	Total	Basic	Elective
		Examinations								Graded test ("-" - simple)				Total for education	Total classroom sessions	Lectons	Laboratory classes	Practical lessons, seminars, exercises, etc.	Practice	Independent study	Hours for preparation and examinations	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									
																						lec	lab	se	lec		lab	se	lec	lab	se	lec	lab	se	lec	lab	se	lec	lab	se	lec	lab				
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.2.2.Б.1	Research Practice/Научно-исследовательская практика																																													
Б.2.2.Б.2	Project Session/Проектная сессия																																													
Б.2.2.Б.3	Laboratory Safety and Biological Workshop/Лабораторная безопасность и биологический практикум																																													
Б.3	State Final Certification/Государственная итоговая аттестация																																													
Б.3.1	Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы																																													
TOTAL:		Number of examinations and pass/fail tests												Obl. ECs.	Distribution of hours by type of lesson								76	Distribution of classroom hours per week by semester								11 130	Total number of credits 240 121 119													
		Examinations								Pass/Fail tests					Distribution of hours of contact work by years and semesters									Total hours 4 542																						
	Fixed (without State Final Examination)	3	3	4	4	3	3	3	4	3	5	5	7		6	7	6	4	10 290	4 125	1 275	930			1 920	2 025	4 140	840	26	30	38					36	36	36	28	21						
	Physical education									1	1	1	1		1	1																														
	Extracurriculars																																													
	State Final Examination								1																																					
												Distribution of credits by years and semesters																Total hours 4 542																		
												1 046				1 328				1 299				869																						
												490	556	676	652	644	655	481	388																											
												55				62				60				63																						
												23	32	27	35	26	34	31	32																											

Head of Academic Management Office I. R. Garayshina