



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.03.04 Applied Mathematics
Educational Programme "Applied Mathematics"

Implementing unit: Tikhonov Moscow Institute of Electronics and Mathematics, HSE - Moscow

Years of Study: 2022/2023 - 2025/2026

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED

19.04.2022

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Block Code	Course	Subject type	Credits	Credits by Years				Planned Educational Programme Development Results
				1	2	3	4	
	Degree Programme		240,00	60,00	60,00	60,00	60,00	
	Major		168,00	53,00	46,00	33,00	36,00	
	Core Professional Block (Major)		113,00	44,00	40,00	21,00	8,00	
1	Theory of Complex Functions	C	4,00		4,00			GPC-1, PC-9, UC-1, UC-2, UC-6
2	Functional Analysis	C	7,00		4,00	3,00		GPC-1, PC-1, PC-9, UC-1, UC-2, UC-6
3	Differential Equations	C	4,00		4,00			GPC-1, PC-9, UC-1, UC-2, UC-6
4	Probability Theory and Mathematical Statistics	C	6,00		6,00			GPC-1, GPC-2, PC-1, PC-7, PC-9, UC-1, UC-2, UC-6
5	Theoretical Mechanics	C	4,00		4,00			GPC-1, GPC-2, PC-1, PC-9, UC-1, UC-2, UC-6
6	Equations of Mathematical Physics	C	4,00			4,00		GPC-1, GPC-2, PC-1, PC-9, UC-1, UC-2, UC-6
7	Optimization Methods	C	3,00			3,00		GPC-1, GPC-2, PC-9, UC-1, UC-2, UC-6
8	Theory of Stochastic Processes	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-9, UC-1, UC-2, UC-6
9	Operating Systems	C	3,00			3,00		GPC-4, PC-3, PC-9, UC-1, UC-2, UC-6
10	Numerical Methods (offered in a foreign language)	C	6,00			3,00	3,00	GPC-3, GPC-4, PC-3, PC-9, UC-1, UC-2, UC-6
11	Physics	C	11,00	7,00	4,00			GPC-1, PC-6, PC-7, PC-9, UC-1, UC-2
12	Algebra	C	4,00	4,00				GPC-1, PC-9, UC-1, UC-2, UC-6
13	Discrete Mathematics	C	4,00	4,00				GPC-1, GPC-2, PC-9, UC-1, UC-2, UC-6
14	Calculus	C	18,00	13,00	5,00			GPC-1, GPC-2, PC-9, UC-1, UC-2, UC-6
15	Calculus	C						GPC-1, GPC-2, PC-9, UC-1, UC-2
16	Linear Algebra and Analytical Geometry	C	10,00	10,00				GPC-1, GPC-2, PC-9, UC-1, UC-2, UC-6
17	Algorithmization and Programming	C	15,00	6,00	9,00			GPC-3, GPC-4, PC-9, UC-1, UC-2, UC-6

18	Control Theory	C	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, PC-3, PC-9, UC-1, UC-2, UC-6
	Elective Professional Block (Major)		55,00	9,00	6,00	12,00	28,00	
	Научно-исследовательский/Проектный семинар		9,00	6,00	3,00			
1	Research Seminar "Modern Computer Calculation Tools" (offered in a foreign language)	C	3,00		3,00			GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-7, PC-9, UC-1, UC-2
2	Career-oriented Seminar "Introduction to Profession"	C	3,00	3,00				GPC-2, PC-2, UC-1, UC-3, UC-4
3	Project Seminar	C	3,00	3,00				GPC-3, GPC-4, PC-9, UC-1, UC-2
	Дисциплины по выбору студентов		19,00			3,00	16,00	
1	Elective Courses	E	3,00			3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
2	Elective Courses	E	7,00				7,00	PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2
3	Elective Courses	E	9,00				9,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2
	Дисциплины по выбору ОП		27,00	3,00	3,00	9,00	12,00	
1	Computer Practicum 2	C	3,00		3,00			GPC-4, PC-8, UC-1, UC-2
2	Applied Stochastic Models and Control	C	6,00				6,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-9, UC-1, UC-2
3	Databases	C	3,00			3,00		GPC-4, PC-3, PC-9, UC-1, UC-2, UC-6
4	Computer Practicum 3	C	3,00			3,00		GPC-3, GPC-4, PC-1, PC-9, UC-1, UC-2
5	Asymptotical Methods	C	6,00			3,00	3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-7, UC-1, UC-2
6	Deep Learning	C	3,00				3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-7, UC-1, UC-2
7	Computer Practicum 1	C	3,00	3,00				GPC-3, GPC-4, PC-5, PC-9, UC-1, UC-2
	Internship		30,00	2,00	3,00	9,00	16,00	
	Professional Internship		7,00			4,00	3,00	
1	Work Experience Internship	C	4,00			4,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5
2	Graduation Internship	C	3,00				3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-6
	Project Internship		10,00	2,00	3,00	5,00		
1	Project (2nd)	C	3,00		3,00			GPC-1, GPC-2, GPC-3, GPC-4, PC-2, PC-4, PC-5, PC-7, UC-1, UC-2, UC-3
2	Research or Applied Project (3rd)	C	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-2, PC-4, PC-5, UC-1, UC-2, UC-3
3	Project	C	2,00	2,00				GPC-3, PC-2, PC-5, PC-7
	Research Internship		13,00				13,00	

		C	13,00				13,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
1	Preparation of Graduation Thesis							
	General Courses		14,00	5,00	1,00	4,00	4,00	
	Core General Courses		2,00	1,00	1,00			
1	Safe Living Basics	C	1,00	1,00				UC-8
2	Physical Training	C	1,00		1,00			UC-7
	Optional General Courses		12,00	4,00		4,00	4,00	
1	Economics	C	4,00			4,00		UC-9
2	Elective General Courses	E	4,00	4,00				UC-5
3	Law	C	4,00				4,00	UC-10
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		GPC-1, GPC-2, UC-1, UC-2
	English		1,00				1,00	
	Examinations		1,00				1,00	
1	Independent English Exam (offered in a foreign language)	C						UC-4
2	Project Proposal (offered in a foreign language)	C	1,00				1,00	UC-4
3	English Language Integrative Exam (offered in a foreign language)	C						UC-4
	Optional Courses							
1	Academic English Writing (offered in a foreign language)	O	2,00				2,00	UC-2, UC-4
2	English (offered in a foreign language)	O	14,00	8,00	6,00			UC-4
	Data Culture		4,00			4,00		
1	External Examinations on Digital Skills. Entry-level	C						GPC-3, UC-1, UC-2
2	External Examinations on Digital Skills. Intermediate Level	C						GPC-3, UC-1, UC-2
3	Data Analysis and Machine Learning	C	3,00			3,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-7, PC-9, UC-1, UC-2
4	Independent Programming Test. Advanced Level	C						GPC-1, GPC-2, UC-1, UC-2
5	Data Science, AI and Generative Models Independent Test. Advanced Level	C	1,00			1,00		GPC-1, GPC-2, UC-1, UC-2
6	External Examinations on Digital Skills. Final Level	C						GPC-3
7	Independent Digital Literacy Test	C						GPC-1, GPC-2, UC-1, UC-2
	Final State Certification (FSC)		3,00				3,00	
	Thesis Work		3,00				3,00	
1	Presenting of Graduation Thesis	C	3,00				3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9

Curriculum agreed:

Academic Supervisor	Presnova A.P.	15.04.2022
Dean	KROUK E.A.	16.04.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	19.04.2022

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O