



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.03.01 Mathematics
Educational Programme "Mathematics"

Implementing unit: Faculty of Informatics, Mathematics and Computer Sciences, HSE - Nizhny Novgorod

Years of Study: 2023/2024 - 2026/2027

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED
10.05.2023
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		161,00	48,00	39,00	35,00	39,00	
	Core Professional Block (Major)		89,00	48,00	33,00	8,00		
1	Probability Theory	C	8,00			8,00		GPC-1, GPC-3, PC-1, PC-4
2	Geometry	C	9,00	9,00				GPC-1, GPC-3, PC-1, PC-4
3	Discrete Mathematics	C	10,00	10,00				GPC-4, PC-1, PC-2
4	Introduction to Topology	C	7,00		7,00			GPC-1, PC-1, PC-4
5	Differential equations and dynamical systems	C	7,00		7,00			GPC-1, GPC-2, PC-1, PC-4
6	Calculus	C	31,00	19,00	12,00			GPC-1, GPC-3, PC-1, PC-4
7	Algebra	C	17,00	10,00	7,00			GPC-1, GPC-3, PC-1, PC-4
	Elective Professional Block (Major)		72,00		6,00	27,00	39,00	
1	Differential Geometry	C	7,00			7,00		GPC-1, PC-1, PC-3
2	Mathematical Physics	C	6,00			6,00		GPC-1, GPC-2, PC-1, PC-2, UC-1
3	Theory of Complex Functions (offered in a foreign language)	C	6,00			6,00		GPC-1, PC-1, PC-3
4	Introduction to Artificial Intelligence	C	3,00				3,00	GPC-1, PC-1, PC-2, UC-6
5	History of Mathematics	C	7,00				7,00	PC-4, UC-5
6	Elements of function approximation theory	C	7,00				7,00	GPC-1, GPC-2, PC-1
7	Computer Topology	C	8,00				8,00	GPC-1, GPC-4, GPC-5, PC-1, PC-2, PC-3
8	Applied theory of dynamical systems (offered in a foreign language)	C	4,00				4,00	GPC-1, GPC-2, GPC-4, PC-1, PC-2, PC-3
9	Research Seminar "Oscillations in Physical Systems"	C	3,00		3,00			GPC-1, GPC-2, PC-2, UC-1
10	Research seminar "Material analysis"	C	3,00		3,00			GPC-1, PC-1, PC-3
11	Research seminar " Optimization Methods"	C	4,00			4,00		GPC-1, GPC-2, GPC-4, PC-1, PC-2

12	Research seminar " Functional analysis"	C	4,00			4,00		GPC-1, PC-1, PC-3
13	Number Theory	C	7,00				7,00	GPC-1, PC-1
14	Theory of Oscillations	C	3,00				3,00	GPC-1, GPC-2, GPC-4, PC-1, PC-2
	Internship		28,00	2,00	7,00	8,00	11,00	
	Professional Internship		8,00				8,00	
1	Graduation Internship	C	8,00				8,00	PC-1, PC-2, PC-3, PC-4, UC-11
	Project Internship		2,00	2,00				
1	Educational and research project	C	2,00	2,00				PC-3, PC-4, UC-1, UC-11, UC-2, UC-3
	Research Internship		18,00		7,00	8,00	3,00	
1	Preparation of Graduation Thesis	C	3,00				3,00	PC-1, PC-2, PC-3, PC-4, UC-1, UC-2, UC-6
2	Term Paper	C	8,00			8,00		GPC-1, GPC-2, GPC-4, GPC-5, PC-1, PC-2, PC-3, UC-1, UC-6
3	Term Paper	C	7,00		7,00			GPC-1, GPC-2, GPC-4, GPC-5, PC-1, PC-2, PC-3, UC-1, UC-6
	General Courses		14,00	7,00	1,00		6,00	
	Core General Courses		2,00	1,00	1,00			
1	Physical Training	C	1,00		1,00			UC-3, UC-7
2	Safe Living Basics	C	1,00	1,00				UC-10, UC-2, UC-8, UC-9
	Optional General Courses		12,00	6,00			6,00	
1	Russian History	C	4,00	4,00				UC-1, UC-3, UC-5
2	Legal Literacy	C	3,00				3,00	UC-1, UC-10, UC-2
3	Economics	C	3,00				3,00	UC-10, UC-2, UC-7, UC-9
4	Foundations of Russian Statehood	C	2,00	2,00				UC-5
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		GPC-1
	English		1,00				1,00	
	Examinations		1,00				1,00	
1	Independent English Exam	C						UC-4
2	Project Proposal	C	1,00				1,00	PC-3, PC-4, UC-4
3	English Language Integrative Exam	C						UC-4
	Optional Courses							
1	English language (offered in a foreign language)	O	14,00	8,00	6,00			UC-4
2	Academic English Writing	O	2,00				2,00	UC-4, UC-5
	Data Culture		13,00	3,00	3,00	7,00		
1	Programming in Python	C	3,00		3,00			GPC-2, GPC-4, GPC-5, PC-2
2	Data Analysis in Python	C	6,00			6,00		GPC-2, GPC-4, GPC-5, PC-2, UC-1
3	Digital Literacy: Basic Course	C	3,00	3,00				UC-1, UC-2, UC-3, UC-6
4	Independent Digital Literacy Test	C						PC-4, UC-2, UC-8
5	External Examinations on Digital Skills. Entry-level	C						GPC-4
6	External Examinations on Digital Skills. Intermediate Level	C						GPC-4
7	Data Science, AI and Generative Models Independent Test. Intermediate	C	1,00			1,00		GPC-4, GPC-5, PC-2, UC-1

8	Independent Programming Test. Intermediate	C					GPC-3, GPC-4, GPC-5, PC-2, UC-1, UC-6
9	External Examinations on Digital Skills. Final Level	C					GPC-4
	Final State Certification (FSC)		3,00			3,00	
	Thesis Work		3,00			3,00	
1	Presenting of Graduation Thesis	C	3,00			3,00	PC-1, PC-2, PC-3, PC-4, UC-4

Curriculum agreed:

Academic Supervisor	CHEBOCHKO N.G.	02.05.2023
Dean	ASEEVA N.V.	02.05.2023
Deputy Director	FOMENKOV D.A.	04.05.2023
Head of Centre for Educational Model Design	LEPESHKIN I.A.	10.05.2023

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O