



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: 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		161,00	46,00	39,00	35,00	41,00	
	Core Professional Block (Major)		87,00	46,00	33,00	8,00		
1	Calculus	C	31,00	19,00	12,00			GPC-1, GPC-3, PC-1, PC-4
2	Algebra	C	17,00	10,00	7,00			GPC-1, GPC-3, PC-1, PC-4
3	Geometry	C	7,00	7,00				GPC-1, GPC-3, PC-1, PC-4
4	Discrete Mathematics	C	10,00	10,00				GPC-4, PC-1, PC-2
5	Differential equations and dynamical systems	C	7,00		7,00			GPC-1, GPC-2, PC-1, PC-4
6	Probability Theory	C	8,00			8,00		GPC-1, GPC-3, PC-1, PC-4
7	Introduction to Topology	C	7,00		7,00			GPC-1, PC-1, PC-4
	Elective Professional Block (Major)		74,00		6,00	27,00	41,00	
1	Research Seminar "Oscillations in Physical Systems"	C	3,00		3,00			GPC-1, GPC-2, PC-2, UC-1
2	Theory of Oscillations	C	3,00				3,00	GPC-2, PC-1, PC-2
3	Number Theory	C	7,00				7,00	GPC-1, PC-1
4	Research seminar "Material analysis"	C	3,00		3,00			GPC-1, PC-1, PC-3
5	Differential Geometry	C	7,00			7,00		GPC-1, PC-1, PC-3
6	Mathematical Physics	C	6,00			6,00		GPC-1, GPC-2, PC-1, PC-2, UC-1
7	Theory of Complex Functions (offered in a foreign language)	C	6,00			6,00		GPC-1, PC-1, PC-3
8	Research seminar " Optimization Methods"	C	4,00			4,00		GPC-1, GPC-2, GPC-4, PC-1, PC-2
9	Computation and optimization for machine learning	C	3,00				3,00	GPC-1, PC-1, PC-2, UC-6
10	Research seminar " Functional analysis"	C	4,00			4,00		GPC-1, PC-1, PC-3
11	History of Mathematics	C	7,00				7,00	PC-4, UC-5
12	Elements of function approximation theory	C	7,00				7,00	GPC-1, GPC-2, PC-1

13	Computer Topology	C	8,00				8,00	GPC-1, GPC-4, GPC-5, PC-1, PC-2, PC-3
14	Applied theory of dynamical systems (offered in a foreign language)	C	6,00				6,00	GPC-1, GPC-2, GPC-4, PC-1, PC-2, PC-3
	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-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	Курсовая работа	C	15,00		7,00	8,00		PC-1, PC-2, PC-3, PC-4, UC-1, UC-2
	General Courses		14,00	9,00	1,00		4,00	
	Core General Courses		2,00	1,00	1,00			
1	Safe Living Basics	C	1,00	1,00				UC-10, UC-2, UC-8, UC-9
2	Physical Training	C	1,00		1,00			UC-3, UC-7
	Optional General Courses		12,00	8,00			4,00	
1	Philosophy	E	4,00				4,00	UC-10, UC-5
2	Economics	C	4,00	4,00				UC-10, UC-2, UC-7, UC-9
3	Legal Literacy	C	4,00	4,00				UC-11, UC-2, UC-4, 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 (offered in a foreign language)	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	Academic Writing (offered in a foreign language)	O	2,00				2,00	UC-4, UC-5
2	English language (offered in a foreign language)	O	14,00	8,00	6,00			UC-4
	Data Culture		13,00	3,00	3,00	7,00		
1	Independent Programming Test. Intermediate	C						GPC-2, GPC-3, GPC-4, GPC-5, PC-2, UC-6
2	External Examinations on Digital Skills. Entry-level	C						GPC-4
3	External Examinations on Digital Skills. Intermediate Level	C						GPC-4
4	Data Science, AI and Generative Models Independent Test. Intermediate	C	1,00			1,00		GPC-4, GPC-5, PC-2
5	External Examinations on Digital Skills. Final Level	C						GPC-4
6	Independent Digital Literacy Test	C						PC-4, UC-2, UC-8
7	Programming in Python	C	3,00		3,00			GPC-2, GPC-4, GPC-5, PC-2
8	Data Analysis in Python	C	6,00			6,00		GPC-2, GPC-4, GPC-5, PC-2, UC-1

9	Digital Literacy: Basic Course	C	3,00	3,00				UC-1, UC-2, UC-3, UC-6
	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.	13.04.2022
Dean	ASEEVA N.V.	14.04.2022
Deputy Director	FOMENKOV D.A.	14.04.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	19.04.2022

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O