



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: 2020/2021 - 2023/2024

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED  
13.05.2021  
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		171,00	49,00	42,00	42,00	38,00	
	Core Professional Block (Major)		93,00	49,00	36,00	8,00		
	Subject Areas		93,00	49,00	36,00	8,00		
	Algebra		18,00	10,00	8,00			
1	Algebra	C	18,00	10,00	8,00			GPC-1, GPC-3, PC-1, PC-4
	Discrete Mathematics		11,00	11,00				
1	Introduction to Discrete Mathematics	C	8,00	8,00				GPC-1, PC-1, PC-4
2	Logic and Algorithms	C	3,00	3,00				GPC-1, GPC-4, PC-1, PC-2, PC-4
	Geometry and Topology		17,00	9,00	8,00			
1	Geometry	C	9,00	9,00				GPC-1, GPC-3, PC-1, PC-4
2	Introduction to Topology	C	8,00		8,00			GPC-1, PC-1, PC-4
	Analysis		31,00	19,00	12,00			
1	Calculus	C	31,00	19,00	12,00			GPC-1, GPC-3, PC-1, PC-4
	Differential Equations and Dynamical Systems		8,00		8,00			
1	Differential equations and dynamical systems	C	8,00		8,00			GPC-1, GPC-2, PC-1, PC-4
	Probability Theory		8,00			8,00		
1	Probability Theory	C	8,00			8,00		GPC-1, GPC-3, PC-1, PC-4
	Elective Professional Block (Major)		78,00		6,00	34,00	38,00	
1	Number Theory	C	7,00				7,00	GPC-3, PC-1, PC-4, UC-1, UC-2
2	Basics of the oscillation theory	C	3,00				3,00	GPC-1, GPC-2, PC-1, PC-2, UC-1
3	Mathematical Physics	C	6,00			6,00		GPC-1, GPC-2, PC-1, PC-2, UC-1
4	Computer Topology	C	8,00				8,00	GPC-1, GPC-2, GPC-4, PC-1, PC-2, PC-3
5	Differential Geometry	C	8,00			8,00		GPC-1, PC-1, PC-3

6	History of Mathematics	C	7,00				7,00	PC-4, UC-5
7	Quantum Mechanics for Mathematicians	C	7,00				7,00	GPC-1, GPC-2, PC-1
8	Research seminar "Material analysis"	C	3,00		3,00			GPC-1, PC-1, PC-3
9	Research seminar " Functional analysis"	C	4,00			4,00		GPC-1, PC-1, PC-3
10	Research seminar " Optimization Methods"	C	4,00			4,00		GPC-1, GPC-2, GPC-4, PC-1, PC-2
11	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
12	Introduction into Python	C	3,00		3,00			GPC-2, GPC-4, PC-2
13	Theory of Complex Functions (offered in a foreign language)	C	9,00			9,00		GPC-4, PC-1, PC-3, UC-1
14	Mathematical game theory	C	3,00			3,00		GPC-1, PC-2, UC-1
	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
	Project Internship		2,00	2,00				
1	Групповой проект 1 курс	E	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	Term Paper	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-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	Legal Literacy	C	4,00				4,00	UC-1, UC-11
2	Philosophy	C	4,00	4,00				UC-5
3	Economics	C	4,00	4,00				UC-10, UC-2, UC-7, UC-9
	Minor		20,00		10,00		10,00	
1	Minor	C	20,00		10,00		10,00	GPC-1
	English		1,00					1,00
	Examinations		1,00					1,00
1	Project Proposal (offered in a foreign language)	C	1,00				1,00	PC-3, PC-4, UC-4
2	English Language Integrative Exam	C						UC-4
3	Independent English Exam (offered in a foreign language)	C						UC-4
	Optional Courses							
1	Academic writing in English	O	2,00				2,00	GPC-3, PC-4, UC-3, UC-4
2	English (offered in a foreign language)	O	14,00	8,00	6,00			UC-4
	Data Culture		3,00				3,00	
1	Introduction to Artificial Intelligence	C	3,00				3,00	GPC-2, GPC-4, PC-2, UC-1
	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
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**Curriculum agreed:**

Academic Supervisor	CHEBOCHKO N.G.	28.04.2021
Dean	ASEEVA N.V.	28.04.2021
Deputy Director	FOMENKOV D.A.	29.04.2021
Head of Centre for Educational Model Design	LEPESHKIN I.A.	13.05.2021

\* Subject type:

Compulsory course	C
Elective course	E
Optional course	O