



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.03.02 Applied Mathematics and Information Science
Educational Programme "Applied Mathematics and Information Science"

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
31.05.2022
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	48,00	39,00	32,00	42,00	
	Core Professional Block (Major)		101,00	39,00	35,00	13,00	14,00	
1	Calculus 2	C	4,00		4,00			GPC-3, GPC-4, PC-3, PC-4, PC-5
2	Algorithms and Data Structures	C	4,00		4,00			GPC-3, GPC-4, GPC-5, PC-3
3	Programming technologies (C++ programming language)	C	6,00		6,00			GPC-3, GPC-4, PC-2, PC-6, UC-5
4	Discrete Mathematics	C	8,00	8,00				GPC-3, GPC-4, PC-3, UC-1
5	Algebra	C	4,00	4,00				GPC-3, GPC-4, PC-3, UC-1
6	Calculus 1	C	8,00	8,00				GPC-3, GPC-4, PC-3, PC-4, PC-5, UC-1
7	Introduction to Programming	C	8,00	8,00				GPC-3, GPC-4, PC-2, PC-6, UC-1, UC-5, UC-8
8	Computer Architecture and Operating Systems	C	9,00	5,00	4,00			GPC-1, PC-1, PC-2, UC-1, UC-2
9	Differential equations (offered in a foreign language)	C	5,00		5,00			GPC-3, GPC-4, PC-3, UC-1
10	Probability Theory and Mathematical Statistics	C	8,00		8,00			GPC-3, GPC-4, PC-3
11	Introduction to multiple hypothesis testing procedures	C	5,00				5,00	GPC-3, GPC-4, PC-3, UC-1
12	Python Programming Language	C	4,00		4,00			GPC-3, GPC-4, PC-2, PC-6, UC-5
13	Machine Learning	C	4,00				4,00	GPC-1, GPC-3, PC-2, UC-1, UC-2
14	Stochastic Methods of Decision Making	C	3,00			3,00		GPC-3, GPC-4, PC-3
15	Risks and random processes	C	5,00				5,00	GPC-3, GPC-4, PC-3
16	Data Bases	C	4,00			4,00		GPC-3, GPC-4, GPC-5, PC-2, UC-5
17	Operations Research	C	6,00			6,00		GPC-3, GPC-4, GPC-5, PC-3
18	Linear Algebra and Geometry	C	6,00	6,00				GPC-3, GPC-4, PC-3, UC-1
	Elective Professional Block (Major)		60,00	9,00	4,00	19,00	28,00	

1	Research Seminar	C	9,00	9,00				GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-5, UC-8
2	Distributed Computing	C	5,00				5,00	GPC-3, GPC-4, PC-3
3	Modeling of Financial Operations (offered in a foreign language)	C	6,00				6,00	GPC-3, GPC-4, PC-3
4	Computational Linguistics	C	6,00				6,00	GPC-3, GPC-4, PC-3
5	The Internet of Things in Practice	C	6,00				6,00	GPC-3, GPC-4, PC-3
6	Network and Web Technologies (offered in a foreign language)	C	4,00			4,00		GPC-3, GPC-4, PC-3
7	Theory and Methods of Translation and Compilation	C	3,00			3,00		GPC-3, GPC-4, PC-3
8	Data Analysis	C	6,00			6,00		GPC-3, GPC-4, GPC-5, PC-3
9	Research Seminar	C	9,00		4,00	2,00	3,00	GPC-3, GPC-4, PC-3
10	Project Seminar	C	2,00				2,00	GPC-3, GPC-4, PC-3
11	Algorithms of Operations Research	C	4,00			4,00		GPC-3, GPC-4, PC-3
	Internship		34,00	7,00	6,00	10,00	11,00	
	Professional Internship		16,00	7,00	1,00	3,00	5,00	
1	Computer Workshop on Numerical Methods	C	7,00	7,00				GPC-2, GPC-3
2	Work Experience Internship	C	3,00			3,00		GPC-4, PC-2, PC-3, PC-7, UC-4, UC-7, UC-8
3	Educational Internship	C	1,00		1,00			GPC-4, PC-2, PC-3, UC-1, UC-4, UC-7
4	Graduation Internship	C	5,00				5,00	GPC-4, PC-2, PC-3, PC-7, UC-4, UC-7, UC-8
	Project Internship		12,00		5,00	7,00		
1	Term Paper	C	10,00		5,00	5,00		GPC-2, GPC-3, UC-2, UC-3, UC-5, UC-6
2	Project Projects	C	2,00			2,00		PC-2, PC-7, UC-1, UC-3, UC-4, UC-8
	Research Internship		6,00				6,00	
1	Preparation of Graduation Thesis	C	6,00				6,00	GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-6, PC-7, UC-2, UC-5, UC-6
	General Courses		14,00	5,00	5,00	4,00		
	Core General Courses		2,00	1,00	1,00			
1	Physical Training	C	1,00		1,00			UC-1
2	Safe Living Basics	C	1,00	1,00				PC-1, UC-1, UC-3, UC-5
	Optional General Courses		12,00	4,00	4,00	4,00		
1	Legal Literacy	C	4,00		4,00			GPC-4, PC-6, PC-7, UC-1, UC-10, UC-5, UC-7, UC-8
2	Philosophy	C	4,00			4,00		GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-6, PC-7, UC-1, UC-10, UC-11, UC-5, UC-7, UC-8, UC-9
3	Economics	C	4,00	4,00				GPC-1, GPC-3, PC-1, UC-1, UC-9
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		GPC-3, GPC-4, UC-1, UC-5, UC-8
	English		1,00				1,00	
	Examinations		1,00				1,00	

1	Independent English Exam (offered in a foreign language)	C					GPC-1, GPC-3, GPC-4, UC-1
2	Project Proposal	C	1,00			1,00	GPC-3, GPC-4, UC-1
3	English Language Integrative Exam	C					GPC-1, GPC-3, GPC-4, UC-1, UC-8
Optional Courses							
1	Academic English Writing (offered in a foreign language)	O	2,00			2,00	GPC-1, GPC-3, GPC-4, UC-1
2	Английский язык (offered in a foreign language)	O	14,00	8,00	6,00		GPC-1, GPC-3, GPC-4, UC-1
Data Culture							
1	Independent Programming Test. Advanced Level	C				4,00	
2	External Examinations on Digital Skills. Entry-level	C					GPC-2, PC-3, UC-1, UC-2, UC-3
3	External Examinations on Digital Skills. Intermediate Level	C					GPC-4
4	Data Science, AI and Generative Models Independent Test. Advanced Level	C	1,00			1,00	GPC-1, GPC-2, PC-3, UC-1, UC-2, UC-3
5	External Examinations on Digital Skills. Final Level	C					GPC-4
6	Selected Data Analysis Topics	C	3,00			3,00	GPC-3, GPC-4, PC-3
7	Independent Digital Literacy Test	C					GPC-1, GPC-2, PC-1, PC-7, UC-1
Final State Certification (FSC)							
Thesis Work							
1	Presenting of Graduation Thesis	C	3,00			3,00	GPC-2, GPC-3, GPC-4, PC-5, PC-7, UC-1, UC-2, UC-6, UC-8
State Examinations							
1	-	C	3,00			3,00	GPC-3, GPC-4, PC-5, PC-7, UC-1, UC-2, UC-3, UC-8

Curriculum agreed:

Academic Supervisor	Колданов П.А.	24.05.2022
Dean	ASEEVA N.V.	25.05.2022
Deputy Director	FOMENKOV D.A.	25.05.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	30.05.2022

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O