



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: 2021/2022 - 2024/2025

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED
01.06.2021
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		156,00	48,00	43,00	35,00	30,00	
	Core Professional Block (Major)		94,00	39,00	39,00	6,00	10,00	
	Subject Areas		94,00	39,00	39,00	6,00	10,00	
	Discrete Mathematics		8,00	8,00				
1	Discrete Mathematics	C	8,00	8,00				GPC-3, GPC-4, PC-3, UC-1
	Linear Algebra and Geometry		15,00	10,00	5,00			
1	Differential equations (offered in a foreign language)	C	5,00		5,00			GPC-3, GPC-4, PC-3, UC-1
2	Algebra	C	4,00	4,00				GPC-3, GPC-4, PC-3, UC-1
3	Linear Algebra and Geometry	C	6,00	6,00				GPC-3, GPC-4, PC-3, UC-1
	Mathematical Analysis		12,00	8,00	4,00			
1	Calculus 1	C	8,00	8,00				GPC-3, GPC-4, PC-3, UC-1
2	Calculus 2	C	4,00		4,00			GPC-3, GPC-4, PC-3
	Probability Theory and Mathematical Statistics		12,00		8,00		4,00	
1	Probability Theory and Mathematical Statistics	C	8,00		8,00			GPC-3, GPC-4, PC-3
2	Introduction to multiple hypothesis testing procedures	C	4,00				4,00	GPC-3, GPC-4, PC-3, UC-1
	Programming		23,00	8,00	12,00	3,00		
1	Selected Data Analysis Topics	C	3,00			3,00		GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-9
2	Software Engineering	C	8,00		8,00			GPC-3, GPC-4, PC-2, PC-6, UC-5
3	Introduction to Programming	C	8,00	8,00				GPC-3, GPC-4, PC-2, PC-6, UC-1, UC-5, UC-8
4	Python for Data Extraction and Processing	C	4,00		4,00			GPC-3, GPC-4, PC-3, UC-1

	Algorithms and Data Structures		5,00		5,00			
1	Algorithms and Data Structures	C	5,00		5,00			GPC-3, GPC-4, PC-3
	Optimization Methods		9,00			3,00	6,00	
1	Stochastic Methods of Decision Making	C	3,00			3,00		GPC-3, GPC-4, PC-3
2	Risks and random processes	C	6,00				6,00	GPC-3, GPC-4, PC-3
	Computer Architecture and Operating Systems		10,00	5,00	5,00			
1	Operating Systems	C	10,00	5,00	5,00			GPC-1, PC-1, PC-2, UC-1, UC-2
	Elective Professional Block (Major)		62,00	9,00	4,00	29,00	20,00	
1	Algorithms of Operations Research	C	3,00			3,00		GPC-3, GPC-4, PC-3, UC-1, UC-2, UC-4
2	Computational Linguistics (offered in a foreign language)	C	6,00				6,00	GPC-3, GPC-4, PC-3
3	The Internet of Things in Practice	C	6,00				6,00	GPC-3, GPC-4, PC-3, UC-10
4	Data Bases	C	4,00			4,00		GPC-3, GPC-4, PC-2, UC-5
5	Operations Research	C	6,00			6,00		GPC-3, GPC-4, PC-3
6	Distributed Computing	C	6,00				6,00	GPC-3, GPC-4, PC-3
7	Network and Web Technologies (offered in a foreign language)	C	4,00			4,00		GPC-3, GPC-4, PC-3
8	Theory and Methods of Translation and Compilation	C	3,00			3,00		GPC-3, GPC-4, PC-3
9	Research Seminar"Web-Programming"	C	5,00	5,00				GPC-3, GPC-4, PC-3
10	Research Seminar	C	13,00	4,00	4,00	3,00	2,00	GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-5, UC-8
11	Data Analysis	C	6,00			6,00		GPC-3, GPC-4, PC-3
	Internship		38,00	7,00	6,00	10,00	15,00	
	Professional Internship		16,00	7,00	1,00	3,00	5,00	
1	Graduation Internship	C	5,00				5,00	GPC-3, GPC-4, PC-3, PC-7, UC-7, UC-8
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	Computer Workshop on Numerical Methods	C	7,00	7,00				GPC-2, GPC-3
	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	Проект ПМИ	E	2,00			2,00		PC-2, PC-6, PC-7, UC-1, UC-3, UC-4, UC-8
	Research Internship		10,00				10,00	
1	Preparation of Graduation Thesis	C	10,00				10,00	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	1,00	4,00	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-2, UC-3, UC-4, UC-5, UC-6, UC-9
2	Philosophy	C	4,00				4,00	UC-11

3	Economics	C	4,00	4,00				GPC-1, GPC-3, PC-1, UC-1, UC-10, 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 (offered in a foreign language)	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 Writing in English (offered in a foreign language)	O	2,00				2,00	GPC-1, GPC-3, GPC-4, PC-7, UC-1
2	English (offered in a foreign language)	O	14,00	8,00	6,00			GPC-1, GPC-3, GPC-4, UC-1
	Data Culture		7,00			1,00	6,00	
1	Independent Data Science Test. Advanced Level	C	1,00			1,00		GPC-1, GPC-2, PC-3, UC-1, UC-2, UC-3
2	Data Analysis and Data Mining	C	6,00				6,00	GPC-3, GPC-4, PC-3
3	Independent Digital Literacy Test	C						GPC-1, GPC-2, PC-1, PC-7, UC-1
4	Independent Programming Test. Advanced Level	C						GPC-2, PC-3, UC-1, UC-2, UC-3
	Final State Certification (FSC)		4,00				4,00	
	Thesis Work		4,00				4,00	
1	Presenting of Graduation Thesis	C	4,00				4,00	GPC-2, GPC-3, GPC-4, PC-7, UC-1, UC-2, UC-6, UC-8
	State Examinations							

Curriculum agreed:

Academic Supervisor	KOLDANOV P.A.	24.05.2021
Dean	ASEEVA N.V.	24.05.2021
Deputy Director	FOMENKOV D.A.	24.05.2021
Head of Centre for Educational Model Design	LEPESHKIN I.A.	31.05.2021

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O