



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: St. Petersburg School of Mathematics, Physics and Computer Science, HSE, HSE - Saint Petersburg

Years of Study: 2023/2024 - 2026/2027

APPROVED
17.05.2023
Vice Rector
ROSHCHIN S.Y.
Signed with EDS

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

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		162,00	50,00	41,00	36,00	35,00	
	Core Professional Block (Major)		108,00	47,00	40,00	15,00	6,00	
1	Discrete Mathematics	C	8,00	4,00	4,00			GPC-1, GPC-3, UC-1, UC-2
2	Formal Languages	C	3,00		3,00			GPC-1, GPC-2, PC-3, PC-5, UC-1, UC-2
3	Linear Algebra and Geometry	C	7,00	7,00				GPC-1, GPC-3, UC-1
4	Algebra	C	4,00	4,00				GPC-1, GPC-3, UC-1
5	Calculus 1	C	10,00	10,00				GPC-1, GPC-3, UC-1
6	Probability Theory and Mathematical Statistics	C	15,00		10,00	5,00		GPC-1, GPC-3, UC-1
7	Introduction to Programming	C	6,00	6,00				GPC-2, GPC-3, GPC-4, UC-1, UC-2
8	C++ Programming Language	C	8,00	8,00				GPC-1, GPC-4, PC-1, PC-3, UC-1, UC-2
9	Java programming language	C	5,00		5,00			GPC-2, GPC-4, PC-3, UC-1, UC-2
10	Functional Programming	C	3,00		3,00			GPC-1, GPC-3, PC-2, UC-1, UC-2
11	Software Development	C	6,00			6,00		GPC-1, GPC-2, PC-3, UC-1, UC-2
12	Parallel programming	C	4,00			4,00		GPC-2, GPC-4, PC-1, PC-2, PC-3, UC-1
13	Web Searching and Ranging	C	6,00				6,00	GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-4, UC-1, UC-2
14	Algorithms and Data Structures	C	10,00	8,00	2,00			GPC-2, GPC-3, UC-1, UC-2
15	Calculus 2	C	5,00		5,00			GPC-1, GPC-2, UC-1
16	Computer Architecture and Operating Systems	C	8,00		8,00			GPC-4, UC-1
	Elective Professional Block (Major)		54,00	3,00	1,00	21,00	29,00	
	Дисциплины по выбору		20,00			20,00		
1	Algorithms in Bioinformatics	E	5,00			5,00		GPC-1, GPC-2, GPC-5, PC-1, PC-2, UC-1
2	Alternative Languages for the JVM	E	5,00			5,00		GPC-3, GPC-4, PC-2, PC-3, UC-1, UC-2

3	Databases	E	5,00			5,00		GPC-1, GPC-4, PC-4, UC-1
4	Deep Learning	E	5,00			5,00		GPC-1, GPC-3, PC-1, PC-2, UC-1, UC-2
5	Graphical Interfaces	E	5,00			5,00		GPC-2, PC-1, PC-6, UC-1
6	Compilers	E	5,00			5,00		GPC-3, PC-2, UC-1
7	Optimization Methods	E	5,00			5,00		GPC-1, GPC-3, PC-2, PC-6, UC-1, UC-2
8	Mobile Development	E	5,00			5,00		GPC-2, GPC-4, PC-1, PC-3, PC-5, UC-1
9	Molecular Biology	E	5,00			5,00		GPC-1, GPC-2, GPC-4, PC-1, UC-1
10	Programming Languages Semantics	E	5,00			5,00		GPC-2, PC-4, PC-5, UC-1
11	Information Theory	E	5,00			5,00		GPC-3, PC-5, UC-1
12	Computer Systems Technology	E	5,00			5,00		GPC-1, GPC-3, PC-2, PC-6, UC-1
13	Types and Programming Languages	E	5,00			5,00		GPC-1, GPC-4, PC-1, PC-3, UC-1
14	Numerical Methods	E	5,00			5,00		GPC-1, GPC-3, PC-2, PC-6, UC-1
	Дисциплины по выбору		15,00				15,00	
1	Meta Computing	E	5,00			5,00		GPC-1, GPC-4, PC-4, UC-1
2	Computational Geometry	E	5,00			5,00		GPC-2, PC-2, UC-1
3	Large-Scale Machine Learning	E	5,00			5,00		GPC-1, GPC-4, PC-4, UC-1
4	Programming with Dependent Types	E	5,00			5,00		GPC-1, GPC-4, PC-3, PC-4, UC-1
5	Computer Graphics	E	5,00			5,00		GPC-1, GPC-3, PC-1, PC-2, UC-1
6	Distributed Systems	E	5,00			5,00		GPC-1, GPC-3, PC-1, PC-2, UC-1
	Elective Courses		9,00				9,00	
1	Image Analysis	E	3,00			3,00		GPC-3, PC-2, UC-1
2	Natural Language Processing	E	3,00			3,00		GPC-3, PC-2, PC-3, UC-1
3	Program Analysis	E	3,00			3,00		GPC-4, PC-1, PC-4, UC-1
4	Cryptographic Protocols	E	3,00			3,00		GPC-1, GPC-3, PC-2, PC-4, PC-6, UC-1
5	Computer Vision	E	3,00			3,00		GPC-1, GPC-2, GPC-4, GPC-5, PC-3, UC-1
6	Logical and Relational Programming	E	3,00			3,00		GPC-2, PC-5, UC-1
	Research seminar		4,00				4,00	
1	Research Seminar	C	4,00				4,00	GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1, UC-2, UC-4, UC-6
	Проектный семинар		6,00	3,00	1,00	1,00	1,00	
1	Project Seminar	C	6,00	3,00	1,00	1,00	1,00	GPC-1, GPC-2, PC-2, PC-3, PC-4, UC-1, UC-3, UC-4, UC-6
	Internship		34,00	3,00	2,00	8,00	21,00	
	Professional Internship		3,00			3,00		
1	Work Experience Internship	C	3,00			3,00		GPC-2, GPC-3, PC-1, PC-3, PC-6, UC-1, UC-2, UC-3, UC-4, UC-6
	Project Internship		19,00	3,00	2,00	5,00	9,00	
1	Project	C	19,00	3,00	2,00	5,00	9,00	GPC-2, GPC-3, PC-2, PC-3, PC-4, UC-1, UC-3, UC-6
	Research Internship		12,00				12,00	
1	Preparation of Graduation Thesis	C	9,00				9,00	UC-1, UC-2, UC-4, UC-6

Head of Centre for
Educational Model Design

LEPESHKIN I.A.

17.05.2023

* Subject type:

Compulsory course C

Elective course E

Optional course O