



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 09.03.01 Information Science and Computation Technology  
Educational Programme "Information Science and Computation Technology"

Specializations: "Automated systems", "Computer Systems and Networks", "Elements and devices of embedded systems"

Implementing unit: Tikhonov Moscow Institute of Electronics and Mathematics, HSE - Moscow

Years of Study: 2023/2024 - 2026/2027

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED  
06.06.2023  
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		164,00	53,00	42,00	36,00	33,00	
	Core Professional Block (Major)		92,00	43,00	33,00	16,00		
1	Electrical Engineering	C	3,00		3,00			GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
2	Electronics	C	6,00		3,00	3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
3	Object-Oriented Programming	C	4,00		4,00			GPC-1, GPC-2, UC-1, UC-2
4	Automata Theory and Control	C	4,00		4,00			GPC-1, GPC-2, UC-1, UC-2
5	Databases	C	4,00		4,00			GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
6	Discrete Mathematics	C	4,00		4,00			GPC-1, GPC-2, UC-1
7	Probability Theory and Mathematical Statistics	C	3,00		3,00			GPC-1, UC-1, UC-2
8	Metrology and Electric and Radio Measurements	C	3,00			3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
9	Circuit Engineering	C	4,00			4,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
10	Computer Systems and Computer Networks	C	3,00			3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
11	Operating Systems	C	3,00			3,00		GPC-1, GPC-2, UC-1, UC-2
12	Computer Science	C	4,00	4,00				GPC-1, GPC-2, UC-1, UC-2
13	Algorithmization and Programming	C	8,00	8,00				GPC-1, GPC-2, UC-1, UC-2
14	Physics	C	16,00	12,00	4,00			GPC-1, PC-2, PC-3, UC-1
15	Algebra and Geometry	C	7,00	7,00				GPC-1, UC-1, UC-2
16	Calculus	C	16,00	12,00	4,00			GPC-1, GPC-2, UC-1
	Elective Professional Block (Major)		72,00	10,00	9,00	20,00	33,00	
	-		22,00	7,00	6,00	6,00	3,00	
1	Project Seminar "Computer Practice in Mathematics"	C	3,00		3,00			GPC-2, GPC-3, PC-1, PC-5, UC-2
2	Project seminar "Practical implementation of the modern technologies for creating information systems"	C	3,00		3,00			GPC-2, GPC-3, GPC-4, PC-3, PC-4, UC-1, UC-2

3	Project Seminar "Programming Tools and Technologies"	C	3,00			3,00		GPC-3, GPC-4, PC-3, PC-5, UC-6
4	Project Seminar "Fundamentals of Production Technology and Machine Learning"	C	3,00			3,00		GPC-3, PC-2, PC-7, UC-2
5	Project Seminar "Project Documentation"	C	3,00				3,00	GPC-2, GPC-3, PC-1, UC-2
6	Project Seminar "Introduction to Project Activities"	C	2,00	2,00				GPC-1, GPC-2, PC-4, UC-2
7	Project Seminar "Python in Data Science"	C	5,00	5,00				GPC-1, GPC-2, PC-3, UC-1, UC-2
	Специальные дисциплины блока направления		32,00			10,00	22,00	
	Автоматизированные системы		32,00			10,00	22,00	
1	Design of the Systems on a Chip	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, PC-6, PC-8, UC-1, UC-2
2	Intelligent Data Processing	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, PC-6, UC-1, UC-2
3	Artificial Intelligence Systems	C	6,00				6,00	GPC-1, GPC-2, PC-1, PC-2, PC-6, UC-1, UC-2
4	System Design of Digital Devices	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, PC-6, UC-1, UC-2
5	High-Level Modelling and Simulation of Digital Systems	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, PC-6, UC-1, UC-2
	Вычислительные системы и компьютерные сети		32,00			10,00	22,00	
1	Network Video Technologies	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
2	Computer Network Design	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
3	Multimedia Technologies	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
4	Network Administration Practice	C	6,00				6,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
5	Web Application Design	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Элементы и устройства встраиваемых систем		32,00			10,00	22,00	
1	Microcontroller Systems	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
2	Functional Units of Control Systems and Components	C	5,00			5,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
3	Standard and Custom Interfaces	C	6,00				6,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
4	Embedded and Distributed Control Systems	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
5	Digital Signal Processing	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Дисциплины по выбору ОП		18,00	3,00	3,00	4,00	8,00	
1	Automation of Design Works	C	4,00			4,00		GPC-1, GPC-3, GPC-6, PC-1, PC-3, UC-1, UC-2
2	Computer Graphics	C	3,00		3,00			GPC-1, GPC-2, UC-1, UC-2
3	Mobile Applications Development	C	4,00				4,00	GPC-1, GPC-2, UC-1, UC-2
4	Information Protection	C	4,00				4,00	GPC-1, GPC-2, UC-1, UC-2
5	Computer-based Workshop on Engineering Graphics	C	3,00	3,00				GPC-3, GPC-4, UC-1
	Internship		30,00		3,00	8,00	19,00	
	Professional Internship		7,00			3,00	4,00	
1	Work Experience Internship	C	3,00			3,00		GPC-5, GPC-7, GPC-8, PC-2, PC-3, PC-6, PC-8, UC-3, UC-4, UC-5

2	Qualifying Internship	C	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
3	Algorithmization and Programming	C						GPC-1, GPC-2, UC-1, UC-2
	<b>Project Internship</b>		<b>8,00</b>		<b>3,00</b>	<b>5,00</b>		
1	Research or Applied Project	C	3,00		3,00			GPC-4, GPC-8, GPC-9, PC-6, PC-7, PC-8, UC-3, UC-6
2	Research or Applied Project	E	5,00			5,00		GPC-4, GPC-8, GPC-9, PC-6, PC-7, PC-8, UC-3, UC-6
	<b>Research Internship</b>		<b>15,00</b>				<b>15,00</b>	
1	Graduation Internship	C	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
2	Preparation of Graduation Thesis	C	11,00				11,00	GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
	<b>General Courses</b>		<b>18,00</b>	<b>7,00</b>	<b>5,00</b>	<b>3,00</b>	<b>3,00</b>	
	<b>Core General Courses</b>		<b>2,00</b>	<b>1,00</b>	<b>1,00</b>			
1	Safe Living Basics	C	1,00	1,00				UC-8
2	Physical Training	C	1,00		1,00			UC-7
	<b>Optional General Courses</b>		<b>16,00</b>	<b>6,00</b>	<b>4,00</b>	<b>3,00</b>	<b>3,00</b>	
1	Sociology for Mathematicians and IT	C	4,00		4,00			UC-3, UC-4, UC-5, UC-6, UC-7
2	Legal Literacy	C	3,00			3,00		UC-10
3	Economics	C	3,00				3,00	UC-9
4	Russian History	C	4,00	4,00				UC-3, UC-4, UC-5, UC-6, UC-7
5	Foundations of Russian Statehood	C	2,00	2,00				UC-3, UC-4, UC-5, UC-6, UC-7
	<b>Minor</b>		<b>20,00</b>		<b>10,00</b>	<b>10,00</b>		
1	Minor	C	20,00		10,00	10,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5
	<b>English</b>		<b>1,00</b>				<b>1,00</b>	
	<b>Examinations</b>		<b>1,00</b>				<b>1,00</b>	
1	Independent English Exam							UC-2, UC-4
2	Project Proposal (offered in a foreign language)	C	1,00				1,00	UC-2, UC-4
3	English Language Integrative Exam (offered in a foreign language)	C						UC-2, UC-4
	<b>Optional Courses</b>							
1	English (offered in a foreign language)	O	14,00	8,00	6,00			UC-3, UC-4, UC-5, UC-6
2	Academic Writing (offered in a foreign language)	O	2,00				2,00	UC-2, UC-4
	<b>Data Culture</b>		<b>4,00</b>			<b>3,00</b>	<b>1,00</b>	
1	Independent Digital Literacy Test	C						GPC-1, GPC-2, UC-1, UC-2

2	Programming of Web Services and Embedded Systems	C	3,00			3,00		GPC-6, PC-8
3	Independent Programming Test. Intermediate	C						GPC-1, GPC-2, UC-1, UC-2
4	Independent Data Science Test. Intermediate	C	1,00				1,00	GPC-1, GPC-2, UC-1, UC-2
	Final State Certification (FSC)		3,00				3,00	
	Thesis Work		3,00				3,00	
1	Presenting of Graduation Thesis	C	3,00				3,00	GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-10, UC-11, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9

**Curriculum agreed:**

Academic Supervisor	POLESSKIY S.N.	30.05.2023
Dean	KROUK E.A.	31.05.2023
Head of Centre for Educational Model Design	LEPESHKIN I.A.	02.06.2023

\* Subject type:

Compulsory course	C
Elective course	E
Optional course	O