



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: 2021/2022 - 2024/2025

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED  
 13.04.2021  
 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		167,00	52,00	45,00	36,00	34,00	
	Core Professional Block (Major)		96,00	45,00	35,00	16,00		
	Subject Areas		96,00	45,00	35,00	16,00		
	Mathematical Analysis		16,00	12,00	4,00			
1	Calculus	C	16,00	12,00	4,00			GPC-1, GPC-2, UC-1
	Algebra and Geometry		5,00	5,00				
1	Algebra and Geometry	C	5,00	5,00				GPC-1, UC-1, UC-2
	Discrete Mathematics		4,00		4,00			
1	Discrete Mathematics	C	4,00		4,00			GPC-1, GPC-2, UC-1
	Probability Theory and Mathematical Statistics		4,00		4,00			
1	Probability Theory and Mathematical Statistics	C	4,00		4,00			GPC-1, UC-1, UC-2
	Physics		16,00	12,00	4,00			
1	Physics	C	16,00	12,00	4,00			GPC-1, PC-2, PC-3, UC-1
	Electrical Engineering		3,00		3,00			
1	Electrical Engineering	C	3,00		3,00			GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Metrology		3,00			3,00		
1	Basics of metrology	C	3,00			3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Theory of Automata and Circuitry		8,00		4,00	4,00		
1	Circuit Engineering	C	4,00			4,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
2	Automata Theory and Control	C	4,00		4,00			GPC-1, GPC-2, UC-1, UC-2
	Computer Science		4,00	4,00				
1	Computer Science	C	4,00	4,00				GPC-1, GPC-2, UC-1, UC-2
	Algorithmisation		12,00	12,00				
1	Algorithmization and Programming	C						GPC-1, GPC-2, UC-1, UC-2

2	Algorithmization and Programming	C	12,00	12,00				GPC-1, GPC-2, UC-1, UC-2
	Programming		4,00		4,00			
1	Object-Oriented Programming	C	4,00		4,00			GPC-1, GPC-2, UC-1, UC-2
	Operating Systems		3,00			3,00		
1	Operating Systems	C	3,00			3,00		GPC-1, GPC-2, UC-1, UC-2
	Electronics		6,00		3,00	3,00		
1	Electronics	C	6,00		3,00	3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Databases		5,00		5,00			
1	Databases	C	5,00		5,00			GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Computing Systems and Computer Networks		3,00			3,00		
1	Computer Systems and Computer Networks	C	3,00			3,00		GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	Elective Professional Block (Major)		71,00	7,00	10,00	20,00	34,00	
	Научно-исследовательский и проектный семинар		24,00	7,00	7,00	6,00	4,00	
1	Project Seminar "Programming Tools and Technologies"	C	3,00			3,00		GPC-3, GPC-4, PC-3, PC-5, UC-6
2	Project Seminar "Fundamentals of Production Technology and Machine Learning"	C	3,00			3,00		GPC-3, PC-2, PC-6, PC-7, UC-2
3	Project Seminar 1	C	2,00	2,00				GPC-1, GPC-2, PC-4, UC-1, UC-2
4	Project Seminar "Python in Data Science"	C	5,00	5,00				GPC-1, GPC-2, PC-3, UC-1, UC-2
5	Project Seminar "Project Documentation"	C	4,00				4,00	GPC-2, GPC-3, GPC-4, GPC-6, UC-1, UC-2
6	Project Seminar "Fundamentals of Design for Computing Devices and Systems"	C	3,00		3,00			GPC-2, GPC-3, GPC-4, PC-3, PC-4, UC-1, UC-2
7	Project Seminar "Computer Practice in Mathematics"	C	4,00		4,00			GPC-2, GPC-3, PC-1, PC-5, UC-2
	Специальные дисциплины блока направления		32,00			10,00	22,00	
	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	Network Administration Practice	C	6,00				6,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
4	Multimedia Technologies	C	8,00				8,00	GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
5	Web Application Development	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
	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
Дисциплины по выбору ОП			15,00		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	Mobile Applications Development	C	4,00				4,00	GPC-1, GPC-2, UC-1, UC-2
3	Information Protection	C	4,00				4,00	GPC-1, GPC-2, UC-1, UC-2
4	Computer Graphics	C	3,00		3,00			GPC-1, GPC-2, UC-1, UC-2
Internship			31,00	3,00	4,00	7,00	17,00	
Professional Internship			7,00			3,00	4,00	
1	Work Experience Internship	C	3,00			3,00		GPC-5, GPC-7, GPC-8, GPC-9, 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-2, UC-3, UC-4, UC-5, UC-6
Project Internship			8,00		4,00	4,00		
1	Исследовательский или прикладной проект	C	8,00		4,00	4,00		GPC-4, GPC-6, GPC-8, GPC-9, PC-6, PC-7, PC-8, UC-3, UC-6
Research Internship			16,00	3,00			13,00	
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-2, UC-3, UC-4, UC-5, UC-6
2	Preparation of Graduation Thesis	C	9,00				9,00	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-2, UC-3, UC-4, UC-5, UC-6
3	Computer-based Workshop on Engineering Graphics	C	3,00	3,00				GPC-2, GPC-3, PC-4, PC-7, UC-1, UC-3
General Courses			14,00	5,00	1,00	4,00	4,00	
Core General Courses			2,00	1,00	1,00			
1	Safe Living Basics	C	1,00	1,00				UC-8
2	Physical Training	C	1,00		1,00			UC-7
Optional General Courses			12,00	4,00		4,00	4,00	
1	Legal Literacy	C	4,00			4,00		UC-3, UC-4, UC-5, UC-6
2	Economics	C	4,00				4,00	UC-3, UC-4, UC-5, UC-6
3	History	C	4,00	4,00				UC-3, UC-4, UC-5, UC-6, UC-7
Minor			20,00		10,00	10,00		

1	Minor	C	20,00		10,00	10,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5
	English		1,00				1,00	
	Examinations		1,00				1,00	
1	Independent English Exam (offered in a foreign language)	C						UC-4
2	Project Proposal	C	1,00				1,00	UC-2, UC-4
3	English Language Integrative Exam (offered in a foreign language)	C						UC-2, UC-4
	Optional Courses							
1	Academic Writing (offered in a foreign language)	O	2,00				2,00	UC-2, UC-4
2	English (offered in a foreign language)	O	8,00	8,00				UC-3, UC-4, UC-5, UC-6
3	English (offered in a foreign language)	O	6,00		6,00			UC-2, UC-4
	Data Culture		4,00			3,00	1,00	
1	Programming of Web Services and Embedded Systems (offered in a foreign language)	C	3,00			3,00		GPC-8, PC-6
2	Independent Digital Literacy Test	C						GPC-1, GPC-2, UC-1, UC-2
3	Independent Data Science Test. Intermediate	C	1,00				1,00	GPC-1, GPC-2, UC-1, UC-2
4	Independent Programming Test. Intermediate	C						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
	State Examinations							

**Curriculum agreed:**

Academic Supervisor POLESSKIY S.N. 30.03.2021

Dean KROUK E.A. 31.03.2021

Head of Centre for Educational Model Design LEPESHKIN I.A. 13.04.2021

\* Subject type:

Compulsory course C

Optional course O