



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 11.03.02 Infocommunication Technologies and Systems
Educational Programme "Infocommunication Technologies and Systems"

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

Years of Study: 2020/2021 - 2023/2024

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED
02.04.2021
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		163,00	51,00	39,00	33,00	40,00	
	Core Professional Block (Major)		78,00	49,00	29,00			
	Subject Areas		78,00	49,00	29,00			
	Higher Mathematics		25,00	21,00	4,00			
1	Calculus	C	16,00	12,00	4,00			GPC-1, UC-1
2	Discrete Mathematics	C	4,00	4,00				GPC-1, UC-1
3	Algebra and Geometry	C	5,00	5,00				GPC-1, UC-1
	Probability Theory and Mathematical Statistics		4,00		4,00			
1	Probability Theory and Mathematical Statistics	C	4,00		4,00			GPC-1, GPC-3, UC-1
	Computer Science		4,00	4,00				
1	Computer Science	C	4,00	4,00				GPC-1, PC-1, UC-1
	Programming		12,00	12,00				
1	Курсовая работа по дисциплине "Алгоритмизация и программирование"	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
	Physics		16,00	12,00	4,00			
1	Physics	C	16,00	12,00	4,00			GPC-1, GPC-2, UC-1
	Electrical Engineering		13,00		13,00			
1	Electric Circuit Theory	C	4,00		4,00			GPC-1, GPC-2, PC-1, UC-1
2	Electronics	C	5,00		5,00			GPC-1, GPC-2, PC-1, UC-1
3	Metrology and Electric and Radio Measurements	C	4,00		4,00			GPC-1, GPC-2, PC-2, UC-1
	Communication Theory		4,00		4,00			
1	The General Theory of Communication	C	4,00		4,00			GPC-1, PC-1, UC-1
	Elective Professional Block (Major)		85,00	2,00	10,00	33,00	40,00	

Вариативная часть (по выбору ОП)			35,00	5,00	18,00	12,00	
1	Fundamentals of Building Information and Communication Systems and Networks	C	5,00	5,00			GPC-1, GPC-3, PC-1, UC-1
2	Digital Signal Processing	C	4,00		4,00		GPC-1, GPC-3, PC-1, UC-1
3	Circuit Engineering of Telecommunication Devices	C	4,00		4,00		GPC-1, GPC-3, PC-1, PC-4, PC-5, UC-1
4	Electronic Devices and Communication Means Physics	C	5,00		5,00		GPC-1, GPC-3, PC-1, UC-1
5	Electromagnetic Fields and Waves in Contemporary Telecommunications	C	5,00		5,00		GPC-1, PC-1, UC-1
6	Digital systems for information transmitting and receiving	C	4,00			4,00	GPC-1, PC-1, UC-1
7	Machine Learning (offered in a foreign language)	C	4,00			4,00	GPC-1, GPC-3, PC-1, UC-1
8	Wireless Communication Systems	C	4,00			4,00	GPC-1, GPC-3, PC-1, UC-1
Научно-исследовательский семинар/Проектный семинар			16,00	2,00	5,00	5,00	4,00
1	Project Seminar	C	14,00		5,00	5,00	4,00
2	Project Seminar 1	C	2,00	2,00			GPC-1, PC-1, UC-1
Compulsory Courses of the Educational Track (1/3)			34,00			10,00	24,00
Electronics of Infocommunication Technologies and Communication Systems			34,00			10,00	24,00
1	Information Technologies of Telecommunications Devices and Systems Development	E	3,00			3,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
2	Communication Technologies and Systems Modeling Basics	E	4,00			4,00	GPC-1, GPC-3, PC-1, PC-4, PC-5, UC-1, UC-2
3	Basics of Television and Radiocommunications	E	3,00			3,00	GPC-1, PC-1, UC-1
4	Digital Devices and Microprocessors	E	4,00			4,00	GPC-1, PC-1, UC-1
5	Communication Devices Components	E	4,00			4,00	GPC-1, PC-1, PC-2, PC-4, UC-1
6	Integrated circuits for telecommunication devices	E	4,00			4,00	GPC-1, PC-1, UC-1
7	Design of electronic components and devices for telecommunication equipment	E	4,00			4,00	GPC-1, PC-1, UC-1
8	Power Supply Devices and Telecommunications	E	4,00			4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
9	Devices of functional electronic	E	4,00			4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
Infocommunication Technologies and Internet of Things			34,00				
1	IoT hardware design fundamentals	E	9,00			5,00	4,00
2	Information and Coding Theories	E	5,00			5,00	GPC-1, GPC-3, PC-1, PC-2, UC-1
3	Antenna systems and devices	E	4,00			4,00	GPC-1, PC-1, UC-1
4	Optoelectronic infocommunication systems	E	4,00			4,00	GPC-2, PC-1, PC-3, UC-1, UC-2
5	Electromagnetic compatibility infocommunication and related systems	E	4,00			4,00	GPC-1, PC-1, UC-1

6	Foundations of the theory of automatic control in technical systems	E	4,00				4,00	GPC-1, PC-1, UC-1
7	Information security and protection of infocommunication systems	E	4,00				4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
Quantum Infocommunication Technologies			34,00			10,00	24,00	
1	Photonic integrated circuits for quantum computing, communications and metrology	E	4,00				4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
2	Physical foundations of quantum phenomena and devices	E	5,00			5,00		GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
3	Mathematical methods of physics	E	5,00			5,00		GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
4	Manetism and spintronics, magnonics, photonics	E	4,00				4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
5	Devices for quantum computing and communication	E	4,00				4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
6	Introduction to quantum algoritms	E	4,00				4,00	GPC-1, GPC-3, GPC-4, PC-1, PC-4, PC-5, PC-8, UC-1, UC-2
7	Quantum solid systems	E	4,00				4,00	GPC-1, PC-4, UC-1, UC-2
8	Introduction to quantum processes and devices (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, PC-2, UC-1
Internship			35,00	4,00	10,00	9,00	12,00	
Professional Internship			15,00	4,00	7,00	4,00		
1	Work Experience Internship	C	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, 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-6
2	Educational Internship	C	4,00		4,00			GPC-1, GPC-2, GPC-3, PC-1, PC-2, PC-4, PC-5, UC-1, UC-2, UC-3, UC-4, UC-6
3	Computer-based Workshop on Engineering Graphics	C	4,00	4,00				GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
4	Computer Workshop "Computer Modeling during the Development of Software/Hardware Radioelectronic Devices"	C	3,00		3,00			GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
Project Internship			14,00		3,00	5,00	6,00	
1	Preparation of Graduation Thesis	C	6,00				6,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3, UC-6
2	Исследовательский или прикладной проект	E	8,00		3,00	5,00		GPC-1, GPC-2, GPC-3, GPC-4, 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
Research Internship			6,00				6,00	
1	Graduation Internship	C	6,00				6,00	GPC-1, GPC-2, GPC-3, GPC-4, 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
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-3, UC-4, UC-5, UC-6, UC-8
2	Physical Training	C	1,00		1,00			UC-7
Optional General Courses			12,00	4,00		4,00	4,00	
1	History	C	4,00	4,00				UC-1, UC-3, UC-5
2	Legal Literacy	C	4,00			4,00		UC-10, UC-11, UC-2, UC-5
3	Economics	C	4,00				4,00	UC-1, UC-10, UC-2, UC-4, UC-5, UC-9
Minor			20,00		10,00	10,00		
1	Minor	C	20,00		10,00	10,00		GPC-1, PC-1, UC-1, UC-2
English			1,00				1,00	
Examinations			1,00				1,00	
1	English Language Integrative Exam	C						UC-4
2	Independent English Exam (offered in a foreign language)	C						UC-4
3	Project Proposal (offered in a foreign language)	C	1,00				1,00	UC-4
Optional Courses								
1	English	O	8,00	8,00				UC-4
2	English (offered in a foreign language)	O	6,00		6,00			UC-4
3	Academic English Writing (offered in a foreign language)	O	2,00				2,00	UC-4
Data Culture			4,00			4,00		
1	Foundations of Computational Methods (offered in a foreign language)	C	4,00			4,00		GPC-1, PC-1, UC-1
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, 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 ELIZAROV A.A. 16.03.2021

Dean KROUK E.A. 22.03.2021

Head of Centre for
Educational Model Design LEPESHKIN I.A. 01.04.2021

* Subject type:

Compulsory course C
Elective course E

Optional course

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