National Research University Higher School of Economics (HSE)

Curriculum Field of study 11.04.04 Electronics and Nanoelectronics Educational Programme "Applied Electronics and Photonics"	APPROVED 22.05.2023 Vice Rector
Trajectories: "Engineering in Electronics, Micro- and Nanoelectronics", "Quantum Nanoelectronics and Materials", "Technological Foundations of Quantum Computing and Quantum Communications"	ROSHCHIN S.Y.
Implementing unit: Tikhonov Moscow Institute of Electronics and Mathematics, HSE - Moscow 1 st, 2023/2024 academic year	Signed with EDS

Length of Programme: 2 years Years of Study: 2023/2024 - 2024/2025 Mode of Study: Full Time Degree: Master's degree / MBA

B

	e Course Subject type				А	llocation of C	Contact Hour	'S			
Block Code			Department	Credits	Total Academic Hours	Contact Hours	1	2	3	4	Additional Information
	Degree Programme			60,00	2 280	416	86	86	124	124	
	Engineering in Electronics, Micro- and	l Nanoeleo	ctronics (Research track)	60,00	2 280	460	90	90	140	140	
	Major			42,00	1 596	384	74	74	118	118	
1	Automated Systems to Ensure Reliability and Quality of Electronic Means	С	School of Electronic Engineering	6,00	228	60			30	30A	
2	Analog and Digital Devices	С	School of Electronic Engineering	12,00	456	104	22	22A	30	30A	
3	Computer-based Measurement Technologies	С	School of Electronic Engineering	6,00	228	68			34	34A	
4	Micro- and Nanoelectronics	С	School of Electronic Engineering	6,00	228	48	24	24A			
5	Fundamentals of conceptual design of innovations	С	School of Electronic Engineering	6,00	228	56	28	28A			
6	Design and Modeling of the Element Base of Microelectronics	С	School of Electronic Engineering	6,00	228	48			24	24A	
	Key Seminars			6,00	228	72	16	16	20	20	
1	Engineering in Electronics, Micro- and Nanoelectronics (mentor's workshop)	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Research and Design Seminar	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
	Magolego			3,00	114						
1	All-university Pool MAGOLEGO Courses	E		3,00	114						

	Internship			9,00	342	4			2	2	
	Project Internship			6,00	228	2				2	
1	Project	С		6,00	228	2				2A	
	Professional Internship		•	3,00	114	2			2		
1	•	С		3,00	114	2			2A		
-	Engineering in Electronics, Micro- and	-	ectronics (Applied track)	60,00	2 280	460	90	90	140	140	
	Major			42,00	1 596	384	74	74	118	118	
	Automated Systems to Ensure	С	School of Electronic	6,00	228	60			30	30A	
1	Reliability and Quality of Electronic Means	-	Engineering								
2	Analog and Digital Devices	С	School of Electronic Engineering	12,00	456	104	22	22A	30	30A	
3	Computer-based Measurement Technologies	С	School of Electronic Engineering	6,00	228	68			34	34A	
4	Micro- and Nanoelectronics	С	School of Electronic Engineering	6,00	228	48	24	24A			
5	Fundamentals of conceptual design of innovations		School of Electronic Engineering	6,00	228	56	28	28A			
6	Design and Modeling of the Element Base of Microelectronics	С	School of Electronic Engineering	6,00	228	48			24	24A	
	Key Seminars			6,00	228	72	16	16	20	20	
1	Engineering in Electronics, Micro- and Nanoelectronics (mentor's workshop)	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Research and Design Seminar	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
	Magolego			3,00	114						
1	All-university Pool MAGOLEGO Courses	E		3,00	114						
	Internship			9,00	342	4			2	2	
	Project Internship			6,00	228	2				2	
1	Project	С		6,00	228	2				2A	
	Professional Internship			3,00	114	2			2		
1	Work Experience Internship	С		3,00	114	2			2A		
	Quantum Nanoelectronics and Materia	als (Rese	arch track)	60,00	2 280	420	86	86	124	124	
	Major			42,00	1 596	344	70	70	102	102	
1	Analytical and Numerical Modeling	С	School of Electronic Engineering	6,00	228	48	24A	24A			
2	Labs in quantum photonics and cryptography	С	School of Electronic Engineering	6,00	228	48			24	24A	
3	Materials and Instruments for Nano- and Optoelectronics	С	School of Electronic Engineering	6,00	228	48	24	24A			
4	Solid-state Electronics Materials	С	School of Electronic Engineering	6,00	228	48			24	24A	
5	Applied Quantum and Statistical Physics	С	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A	
6	Experimental Methods of Photonics	С	School of Electronic Engineering	6,00	228	48			24	24A	

	Key Seminars			6,00	228	72	16	16	20	20	
	Quantum nanoelectronics and	С	School of Electronic	3,00	114	36	8	8	10	10A	
1	materials (mentor workshop)	-	Engineering	-,				-	-	-	
	Research and Design Seminar	С	School of Electronic	3,00	114	36	8	8	10	10A	
2			Engineering								
	Magolego			3,00	114						
	All-university Pool MAGOLEGO	E		3,00	114						
1	Courses										
	Internship			9,00	342	4			2	2	
	Project Internship			6,00	228	2				2	
1	Project	С		6,00	228	2				2A	
	Professional Internship			3,00	114	2			2		
1	Work Experience Internship	С		3,00	114	2			2A		
	Quantum Nanoelectronics and Materi	als (Ap	plied track)	60,00	2 280	420	86	86	124	124	
	Major		· · ·	42,00	1 596	344	70	70	102	102	
	Analytical and Numerical Modeling	С	School of Electronic	6,00	228	48	24A	24A			
1			Engineering								
	Labs in quantum photonics and	С	School of Electronic	6,00	228	48			24	24A	
2	cryptography		Engineering								
	Materials and Instruments for Nano-	С	School of Electronic	6,00	228	48	24	24A			
3	and Optoelectronics		Engineering								
	Solid-state Electronics Materials	С	School of Electronic	6,00	228	48			24	24A	
4			Engineering								
	Applied Quantum and Statistical	С	School of Electronic	12,00	456	104	22A	22	30A	30A	
5	Physics		Engineering								
	Experimental Methods of Photonics	С	School of Electronic	6,00	228	48			24	24A	
6			Engineering								
	Key Seminars	1-		6,00	228	72	16	16	20	20	
	Quantum nanoelectronics and	С	School of Electronic	3,00	114	36	8	8	10	10A	
1	materials (mentor workshop)	0	Engineering	0.00	44.4			0	40	104	
2	Research and Design Seminar	С	School of Electronic	3,00	114	36	8	8	10	10A	
2	Manalana		Engineering	2.00	114						
		Te		3,00							
1	All-university Pool MAGOLEGO Courses	E		3,00	114						
1	Internship			9,00	342	4			2	2	
	Project Internship			6,00	228	2			2	2	
1	Project Internship Project	С		6,00	228	2				2A	
1					114					ZA	
4	Professional Internship			3,00	114	2			2		
1	Work Experience Internship	C		3,00		2			2A	404	
	Technological Foundations of Quantu Communications (Research track)	Im Con	iputing and Quantum	60,00	2 280	420	86	86	124	124	
	Major			42,00	1 596	344	70	70	102	102	
1	Analytical and Numerical Modeling	С	School of Electronic Engineering	6,00	228	48	24A	24A			
	Labs in quantum photonics and	С	School of Electronic	6,00	228	48			24	24A	
2	cryptography		Engineering								

3	Materials and Instruments for Nano- and Optoelectronics	С	School of Electronic Engineering	6,00	228	48	24	24A			
4	Solid-state Electronics Materials	С	School of Electronic Engineering	6,00	228	48			24	24A	
5	Applied Quantum and Statistical Physics	С	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A	
6	Experimental Methods of Photonics	С	School of Electronic Engineering	6,00	228	48			24	24A	
	Key Seminars		-	6,00	228	72	16	16	20	20	
1	Research and Design Seminar	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Technological Foundations of Quantum Computing and Quantum Communications (mentor's workshop)	С	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
	Magolego			3,00	114						
1	All-university Pool MAGOLEGO Courses	E		3,00	114						
	Internship		÷	9,00	342	4			2	2	
	Project Internship			6,00	228	2				2	
1	Project	С		6,00	228	2				2A	
	Professional Internship			3,00	114	2			2		
1	Work Experience Internship	С		3,00	114	2			2A		
	Technological Foundations of Quantu Communications (Applied track)	m Comp	uting and Quantum	60,00	2 280	420	86	86	124	124	
	Major			42,00	1 596	344	70	70	102	102	
1	Analytical and Numerical Modeling	С	School of Electronic Engineering	6,00	228	48	24A	24A			
2	Labs in quantum photonics and cryptography	С	School of Electronic Engineering	6,00	228	48			24	24A	
3	Materials and Instruments for Nano- and Optoelectronics		School of Electronic Engineering	6,00	228	48	24	24A			
4	Solid-state Electronics Materials	С	School of Electronic Engineering	6,00	228	48			24	24A	
1 '											
5	Applied Quantum and Statistical Physics	C	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A	
5 6	Physics Experimental Methods of Photonics		School of Electronic	6,00	228	48			24	24A	
	Physics Experimental Methods of Photonics Key Seminars	С	School of Electronic Engineering School of Electronic Engineering	6,00 6,00	228 228	48 72	16	16	24 20	24A 20	
	Physics Experimental Methods of Photonics Key Seminars Research and Design Seminar		School of Electronic Engineering School of Electronic Engineering School of Electronic Engineering	6,00 6,00 3,00	228 228 114	48 72 36	16 8	16 8	24 20 10	24A 20 10A	
	Physics Experimental Methods of Photonics Key Seminars	С	School of Electronic Engineering School of Electronic Engineering School of Electronic	6,00 6,00	228 228	48 72	16	16	24 20	24A 20	
6	Physics Experimental Methods of Photonics Key Seminars Research and Design Seminar Technological Foundations of Quantum Computing and Quantum Communications (mentor's workshop) Magolego	С	School of Electronic Engineering School of Electronic Engineering School of Electronic Engineering School of Electronic	6,00 6,00 3,00	228 228 114 114 114	48 72 36	16 8	16 8	24 20 10	24A 20 10A	
6	Physics Experimental Methods of Photonics Key Seminars Research and Design Seminar Technological Foundations of Quantum Computing and Quantum Communications (mentor's workshop) Magolego	С	School of Electronic Engineering School of Electronic Engineering School of Electronic Engineering School of Electronic	6,00 6,00 3,00 3,00	228 228 114 114	48 72 36	16 8	16 8	24 20 10	24A 20 10A	

	Project Internship		6,00	228	2			2	
1	Project	C	6,00	228	2			2A	
	Professional Internship		3,00	114	2		2		
1	Work Experience Internship	C	3,00	114	2		2A		

Curriculum agreed:

Academic Supervisor	ARUTYUNOV K.Y.	12.05.2023
Dean	KROUK E.A.	15.05.2023
Head of Centre for Educational Model Design	LEPESHKIN I.A.	22.05.2023

* Subject type:	
Compulsory course	С
Elective course	E