National Research University Higher School of Economics (HSE)

Curriculum
Field of study 11.04.04 Electronics and Nanoelectronics
Educational Programme "Applied Electronics and Photonics"
Trajectories: "Engineering in Electronics, Micro- and Nanoelectronics", "Quantum Nanoelectronics and Materials", "Technological Foundations of Quantum Computing and Quantum Communications"
Implementing unit: Tikhonov Moscow Institute of Electronics and Mathematics, HSE - Moscow
1 st, 2023/2024 academic year

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

Block Code	Course	Subject type	Department	Credits	Total Academic Hours	Contact Hours	Allocation of Contact Hours				Additional Information
							1	2	3	4	
	Degree Programme			**60,00**	**2 280**	**416**	**86**	**86**	**124**	**124**	
	Engineering in Electronics, Micro- and Nanoelectronics (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	C	School of Electronic Engineering	6,00	228	60			30	30A	
2	Analog and Digital Devices	C	School of Electronic Engineering	12,00	456	104	22	22A	30	30A	
3	Computer-based Measurement Technologies	C	School of Electronic Engineering	6,00	228	68			34	34A	
4	Micro- and Nanoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A			
5	Fundamentals of conceptual design of innovations	C	School of Electronic Engineering	6,00	228	56	28	28A			
6	Design and Modeling of the Element Base of Microelectronics	C	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)	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Research and Design Seminar	C	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						

#	Name		Dept.							
	Internship			9,00	342	4			2	2
	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	
	Engineering in Electronics, Micro- and Nanoelectronics (Applied 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	C	School of Electronic Engineering	6,00	228	60			30	30A
2	Analog and Digital Devices	C	School of Electronic Engineering	12,00	456	104	22	22A	30	30A
3	Computer-based Measurement Technologies	C	School of Electronic Engineering	6,00	228	68			34	34A
4	Micro- and Nanoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A		
5	Fundamentals of conceptual design of innovations	C	School of Electronic Engineering	6,00	228	56	28	28A		
6	Design and Modeling of the Element Base of Microelectronics	C	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)	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A
2	Research and Design Seminar	C	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	C		6,00	228	2				2A
	Professional Internship			3,00	114	2			2	
1	Work Experience Internship	C		3,00	114	2			2A	
	Quantum Nanoelectronics and Materials (Research 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	C	School of Electronic Engineering	6,00	228	48	24A	24A		
2	Labs in quantum photonics and cryptography	C	School of Electronic Engineering	6,00	228	48			24	24A
3	Materials and Instruments for Nano- and Optoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A		
4	Solid-state Electronics Materials	C	School of Electronic Engineering	6,00	228	48			24	24A
5	Applied Quantum and Statistical Physics	C	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A
6	Experimental Methods of Photonics	C	School of Electronic Engineering	6,00	228	48			24	24A

#	Name	Type	School								
	Key Seminars			**6,00**	**228**	**72**	**16**	**16**	**20**	**20**	
1	Quantum nanoelectronics and materials (mentor workshop)	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Research and Design Seminar	C	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	C		6,00	228	2				2A	
	Professional Internship			**3,00**	**114**	**2**			**2**		
1	Work Experience Internship	C		3,00	114	2			2A		
	Quantum Nanoelectronics and Materials (Applied 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	C	School of Electronic Engineering	6,00	228	48	24A	24A			
2	Labs in quantum photonics and cryptography	C	School of Electronic Engineering	6,00	228	48			24	24A	
3	Materials and Instruments for Nano- and Optoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A			
4	Solid-state Electronics Materials	C	School of Electronic Engineering	6,00	228	48			24	24A	
5	Applied Quantum and Statistical Physics	C	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A	
6	Experimental Methods of Photonics	C	School of Electronic Engineering	6,00	228	48			24	24A	
	Key Seminars			**6,00**	**228**	**72**	**16**	**16**	**20**	**20**	
1	Quantum nanoelectronics and materials (mentor workshop)	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A	
2	Research and Design Seminar	C	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	C		6,00	228	2				2A	
	Professional Internship			**3,00**	**114**	**2**			**2**		
1	Work Experience Internship	C		3,00	114	2			2A		
	Technological Foundations of Quantum Computing and Quantum Communications (Research 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	C	School of Electronic Engineering	6,00	228	48	24A	24A			
2	Labs in quantum photonics and cryptography	C	School of Electronic Engineering	6,00	228	48			24	24A	

#	Course	Type	School	Credits	Hours					
3	Materials and Instruments for Nano- and Optoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A		
4	Solid-state Electronics Materials	C	School of Electronic Engineering	6,00	228	48			24	24A
5	Applied Quantum and Statistical Physics	C	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A
6	Experimental Methods of Photonics	C	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	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A
2	Technological Foundations of Quantum Computing and Quantum Communications (mentor's workshop)	C	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	C		6,00	228	2				2A
	Professional Internship			**3,00**	**114**	**2**			**2**	
1	Work Experience Internship	C		3,00	114	2			2A	
	Technological Foundations of Quantum Computing and Quantum Communications (Applied 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	C	School of Electronic Engineering	6,00	228	48	24A	24A		
2	Labs in quantum photonics and cryptography	C	School of Electronic Engineering	6,00	228	48			24	24A
3	Materials and Instruments for Nano- and Optoelectronics	C	School of Electronic Engineering	6,00	228	48	24	24A		
4	Solid-state Electronics Materials	C	School of Electronic Engineering	6,00	228	48			24	24A
5	Applied Quantum and Statistical Physics	C	School of Electronic Engineering	12,00	456	104	22A	22	30A	30A
6	Experimental Methods of Photonics	C	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	C	School of Electronic Engineering	3,00	114	36	8	8	10	10A
2	Technological Foundations of Quantum Computing and Quantum Communications (mentor's workshop)	C	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	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   C
Elective course   E