National Research University Higher School of Economics (HSE)

APPROVED
12.05.2023
Vice Rector
ROSHCHIN S.Y.
Signed with EDS

Basic Curriculum

Field of study 03.04.02 Physics
Educational Programme "Physics"
Trajectories: "Physics and Technology of Nanostructures", "Theoretical Physics"
Implementing unit: St. Petersburg School of Mathematics, Physics and Computer Science, HSE, HSE - Saint Petersburg
Years of Study: 2023/2024 - 2024/2025
Length of Programme: 2 years
Mode of Study: Full Time
Degree: Master’s degree / MBA

Block Code	Course	Subject type	Credits	Credits by Years		Planned Educational Programme Development Results
				1	2	
	Degree Programme		120,00	60,00	60,00	
	Physics and Technology of Nanostructures (Research track)		120,00	60,00	60,00	
	Key Seminars		15,00	6,00	9,00	
1	Mentor's Seminar	C	9,00	6,00	3,00	GPC-4.PHY, UC-1, UC-6
2	Research seminar "Nanostructures and nanomaterials"	C	6,00		6,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, PC-1, PC-2, PC-3, PC-4, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Internship		33,00	3,00	30,00	
	Project Internship		12,00	3,00	9,00	
1	Project	C	12,00	3,00	9,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, PC-1, PC-2, PC-3, PC-4, UC-1, UC-2, UC-3, UC-4
	Research Internship		21,00		21,00	
1	Preparation of Final Qualificaiton Paper	C	6,00		6,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, 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	Research Internship	C	15,00		15,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, PC-1, PC-2, PC-3, PC-4, PC-6, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		54,00	42,00	12,00	
	Major		54,00	42,00	12,00	

1	Introduction to Nanotechnology	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-4.PHY, UC-2, UC-3, UC-5, UC-6
2	Experimental Methods for Studying the Properties of Semiconductor Nanostructures	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, UC-1, UC-2, UC-6
3	Introduction to Experimental Optics	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, UC-1, UC-2, UC-3
4	Nanoplasmonics	C	6,00	6,00		GPC-1.PHY, GPC-3.PHY, GPC-4.PHY, UC-1, UC-6
5	Introduction to Nanophotonics	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-4.PHY, UC-2, UC-3, UC-5, UC-6
6	Modeling of Quantum Systems	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, UC-1, UC-2, UC-3
7	Physics of Low-Dimensional Systems	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, UC-1, UC-2, UC-3
8	Quantum Transport	C	6,00		6,00	GPC-1.PHY, GPC-3.PHY, GPC-4.PHY, UC-1
9	Technology of semiconductor nanostructures	C	6,00		6,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, UC-1, UC-2, UC-3
	Magolego		15,00	9,00	6,00	
1	All-university Pool MAGOLEGO Courses	E	15,00	9,00	6,00	GPC-1.PHY, GPC-2.PHY, UC-2, UC-3
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, 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
	Theoretical Physics (Research track)		120,00	60,00	60,00	
	Key Seminars		15,00	6,00	9,00	
1	Mentor's Seminar	C	9,00	6,00	3,00	GPC-4.PHY, UC-1, UC-6
2	Research seminar "Additional chapters of theoretical physics"	C	6,00		6,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, PC-1, PC-2, PC-3, PC-4, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Internship		33,00	3,00	30,00	
	Project Internship		12,00	3,00	9,00	
1	Project	C	12,00	3,00	9,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, PC-1, PC-2, PC-3, PC-4, UC-1, UC-2, UC-3, UC-4
	Research Internship		21,00		21,00	
1	Preparation of Final Qualificaiton Paper	C	6,00		6,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, 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	Research Internship	C	15,00		15,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, PC-1, PC-2, PC-3, PC-4, PC-6, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		54,00	42,00	12,00	
	Major		54,00	42,00	12,00	
1	Physical Kinetics	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-4.PHY, UC-2, UC-3, UC-5, UC-6
2	Conformal Field Theory	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-4.PHY, UC-1, UC-4, UC-6
3	Quantum Electrodynamics	C	6,00	6,00		GPC-1.PHY, UC-1, UC-3, UC-4
4	Methods of Quantum Field Theory in Condensed Matter Physics	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-4.PHY, UC-1, UC-2, UC-3
5	Integrable Systems 1	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, UC-1, UC-2, UC-3
6	Modeling of Quantum Systems	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, UC-1, UC-2, UC-3
7	Physics of Low-Dimensional Systems	C	6,00	6,00		GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, UC-1, UC-2, UC-3
8	Gauge Theory	C	6,00		6,00	GPC-1.PHY, GPC-3.PHY, GPC-4.PHY, UC-1
9	Quantum Transport	C	6,00		6,00	GPC-1.PHY, GPC-3.PHY, GPC-4.PHY, UC-1
	Magolego		15,00	9,00	6,00	
1	All-university Pool MAGOLEGO Courses	E	15,00	9,00	6,00	GPC-1.PHY, GPC-2.PHY, UC-2, UC-3
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.PHY, GPC-2.PHY, GPC-3.PHY, GPC-4.PHY, 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

Curriculum agreed:

Academic Supervisor	ZHURIKHINA V.V.	16.03.2023
Dean		16.03.2023
Deputy Director	KUZMIN P.V.	16.03.2023
Head of Centre for Educational Model Design	LEPESHKIN I.A.	04.05.2023

* Subject type:

Compulsory course	C
Elective course	E