



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 11.04.02 Infocommunication Technologies and Systems  
 Educational Programme "Internet of Things and Cyber-physical Systems"  
 Trajectories: "Cyber-physical Systems", "Internet of Things"

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

Years of Study: 2022/2023 - 2023/2024

Length of Programme: 2 years

Mode of Study: Full Time

Degree: Master's degree / MBA

APPROVED  
 15.07.2022  
 Vice Rector  
 ROSHCHIN S.Y.  
 Signed with EDS

Block Code	Course	Subject type	Credits	Credits by Years		Planned Educational Programme Development Results
				1	2	
	Degree Programme		120,00	60,00	60,00	
	General Components		42,00	39,00	3,00	
	Key Seminars		9,00	6,00	3,00	
1	Project Seminar	C	9,00	6,00	3,00	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Internship					
	Professional Internship					
	Research Internship					
	Major		33,00	33,00		
	Обязательные дисциплины программы		30,00	30,00		
1	Network Technologies in Machine-to-Machine (M2M) Communications	C	6,00	6,00		GPC-1, GPC-3, PC-2, PC-3, UC-1, UC-3
2	Sensor Systems	C	3,00	3,00		GPC-1, GPC-3, PC-5, PC-7, UC-3, UC-5
3	IoT/CPS Hardware	C	6,00	6,00		GPC-2, GPC-4, PC-1, PC-6, UC-4, UC-6
4	Cyber Security IoT/CPS	C	6,00	6,00		GPC-1, GPC-2, PC-8, PC-9, UC-1, UC-3
5	IoT/CPS software development	C	6,00	6,00		GPC-3, GPC-4, PC-10, PC-8, UC-1, UC-5
6	Introduction to IoT/CPS	C	3,00	3,00		GPC-2, GPC-3, PC-3, PC-4, PC-5, UC-1, UC-3
	Дисциплины по выбору студента		3,00	3,00		
1	IoT/CPS Development Project Management	E	3,00	3,00		GPC-2, GPC-3, PC-6, PC-7, UC-1, UC-5
2	Product management and economics of IoT/CPS	E	3,00	3,00		GPC-2, GPC-3, PC-4, PC-5, UC-1, UC-4
	Magolego					
	Internet of Things (Applied track)		78,00	60,00	60,00	

	Key Seminars		6,00	9,00	6,00	
1	Internet of Things (mentor workshop)	C	6,00	3,00	3,00	GPC-1, GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Internship		33,00	6,00	27,00	
	Project Internship		6,00	6,00		
1	Project	E	6,00	6,00		GPC-1, GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Professional Internship		15,00		15,00	
1	Work Experience Internship	C	15,00		15,00	GPC-2, GPC-3, PC-1, PC-2, PC-3, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Research Internship		12,00		12,00	
1	Graduation Thesis	C	12,00		12,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-12, PC-13, PC-14, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		27,00	39,00	21,00	
1	Machine learning and artificial intelligence	C	6,00		6,00	GPC-2, GPC-4, PC-4, PC-5, UC-3, UC-5
2	Sensor data processing	C	3,00		3,00	GPC-2, GPC-4, PC-10, UC-3, UC-5
3	Methods and Systems for Processing Big Data	C	6,00		6,00	GPC-2, GPC-3, PC-14, UC-1, UC-2
4	Building distributed systems and cloud computing	C	6,00		6,00	GPC-3, GPC-4, PC-4, PC-5, UC-1, UC-5
5	Ensuring interaction of IoT system elements, interfaces and protocols	C	6,00	6,00		GPC-1, GPC-3, PC-2, PC-4, UC-1, UC-2
	Magolego		9,00	6,00	3,00	
1	All-university Pool MAGOLEGO Courses	E	9,00	6,00	3,00	GPC-1, GPC-2, GPC-3, GPC-4
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-12, PC-13, PC-14, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Cyber-physical Systems (Applied track)		78,00	54,00	57,00	
	Key Seminars		6,00	3,00	3,00	
1	Cyber-Physical Systems (mentor workshop)	C	6,00	3,00	3,00	GPC-1, GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Internship		33,00	6,00	27,00	
	Project Internship		6,00	6,00		
1	Project	E	6,00	6,00		GPC-1, GPC-2, GPC-3, GPC-4, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Professional Internship		15,00		15,00	

1	Work Experience Internship	C	15,00		15,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Research Internship		12,00		12,00	
1	Graduation Thesis	C	12,00		12,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-12, PC-13, PC-14, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		27,00	39,00	21,00	
1	Machine learning and artificial intelligence	C	6,00		6,00	GPC-3, GPC-4, PC-12, PC-13, UC-4, UC-5
2	Programming real-time systems	C	6,00		6,00	GPC-3, GPC-4, PC-10, PC-9, UC-1, UC-5
3	Digital Manufacturing Technologies and Industrial Robotics	C	3,00		3,00	GPC-2, PC-3, PC-4, UC-4, UC-5
4	Construction of robotic systems	C	6,00		6,00	GPC-3, GPC-4, PC-3, PC-4, UC-5, UC-6
5	Human-Computer Interaction	C	6,00	6,00		GPC-2, GPC-3, PC-5, PC-6, UC-1, UC-3
	Magolego		9,00	6,00	3,00	
1	All-university Pool MAGOLEGO Courses	E	9,00	6,00	3,00	GPC-1, GPC-2, GPC-3, GPC-4
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-12, PC-13, PC-14, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6

**Curriculum agreed:**

Academic Supervisor	IVANOV I.A.	06.07.2022
Dean	KROUK E.A.	06.07.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	08.07.2022

\* Subject type:

Compulsory course	C
Elective course	E