



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: "Artificial Intelligence Software and Hardware", "Internet of Things"

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

Years of Study: 2023/2024 - 2024/2025

Length of Programme: 2 years

Mode of Study: Full Time

Degree: Master's degree / MBA

APPROVED

18.05.2023

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	
	Internet of Things (Applied track)		120,00	60,00	60,00	
	Key Seminars		15,00	9,00	6,00	
1	Internet of Things (mentor workshop)	C	6,00	3,00	3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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	C	6,00	6,00		GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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
	Professional Internship		12,00		12,00	
1	Work Experience Internship	C	12,00		12,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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
	Research Internship		15,00		15,00	

1	-	C	15,00		15,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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		60,00	39,00	21,00	
1	Ensuring interaction of IoT system elements, interfaces and protocols	C	6,00	6,00		GPC-1.ITS, GPC-3.ITS, PC-2, PC-4, UC-1, UC-2
2	Building distributed systems and cloud computing	C	6,00		6,00	GPC-3.ITS, GPC-4.ITS, PC-4, PC-5, UC-1, UC-5
3	Machine learning and artificial intelligence	C	6,00		6,00	GPC-2.ITS, GPC-4.ITS, PC-4, PC-5, UC-3, UC-5
4	Methods and Systems for Processing Big Data	C	6,00		6,00	GPC-2.ITS, GPC-3.ITS, PC-14, UC-1, UC-2
5	Sensor data processing	C	3,00		3,00	GPC-2.ITS, GPC-4.ITS, PC-10, UC-3, UC-5
	Magolego		9,00	6,00	3,00	
1	All-university Pool MAGOLEGO Courses	E	9,00	6,00	3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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
	Artificial Intelligence Software and Hardware (Applied track)		120,00	60,00	60,00	
	Key Seminars		15,00	9,00	6,00	
1	Hardware and software systems for AI (mentor workshop)	C	6,00	3,00	3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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	C	6,00	6,00		GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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
	Professional Internship		12,00		12,00	
1	Work Experience Internship	C	12,00		12,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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

	Research Internship		15,00		15,00	
1	-	C	15,00		15,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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		60,00	39,00	21,00	
1	Statistical theory of signal detection and pattern recognition	C	3,00	3,00		GPC-2.ITS, PC-3, PC-4, PC-5, UC-4, UC-5
2	Programming of neurocomputer systems	C	6,00	3,00	3,00	GPC-3.ITS, GPC-4.ITS, PC-3, PC-4, UC-5, UC-6
3	Multithreaded Programming	C	3,00		3,00	GPC-2.ITS, GPC-3.ITS, PC-12, PC-14, UC-1, UC-4, UC-6
4	Industrial Programming	C	3,00		3,00	GPC-1.ITS, GPC-3.ITS, PC-12, PC-14, UC-4, UC-5
5	Circuitry of Computing Systems and Devices	C	3,00		3,00	GPC-3.ITS, GPC-4.ITS, PC-1, PC-2, PC-3, UC-4, UC-5
6	Computer Architectures	C	3,00		3,00	GPC-2.ITS, GPC-3.ITS, PC-14, PC-6, PC-7, PC-8, UC-2, UC-3, UC-6
7	Digital Signal Processing	C	6,00		6,00	GPC-3.ITS, GPC-4.ITS, PC-13, PC-4, PC-7
	Magolego		9,00	6,00	3,00	
1	All-university Pool MAGOLEGO Courses	E	9,00	6,00	3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.ITS, GPC-2.ITS, GPC-3.ITS, GPC-4.ITS, 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
	General Components		42,00	39,00	3,00	
	Key Seminars		9,00	6,00	3,00	
1	Project Seminar	C	6,00	3,00	3,00	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
2	Mentor's Seminar	C	3,00	3,00		GPC-1.ITS, GPC-3.ITS, UC-1, UC-2, UC-6
	Internship					
	Project Internship					
	Professional Internship					
	Research Internship					
	Major		33,00	33,00		
	Elective Courses (1 out of 2)		3,00	3,00		
1	Product management and economics of IoT/CPS	E	3,00	3,00		GPC-2.ITS, GPC-3.ITS, PC-4, PC-5, UC-1, UC-4

2	IoT/CPS Development Project Management	E	3,00	3,00		GPC-2.ITS, GPC-3.ITS, PC-6, PC-7, UC-1, UC-5
	Обязательные дисциплины программы		30,00	30,00		
1	IoT/CPS Hardware	C	6,00	6,00		GPC-2.ITS, GPC-4.ITS, PC-1, PC-6, UC-4, UC-6
2	Introduction to IoT/CPS	C	3,00	3,00		GPC-2.ITS, GPC-3.ITS, PC-3, PC-4, PC-5, UC-1, UC-3
3	Sensor Systems	C	3,00	3,00		GPC-1.ITS, GPC-3.ITS, PC-5, PC-7, UC-3, UC-5
4	Cyber Security IoT/CPS	C	6,00	6,00		GPC-1.ITS, GPC-2.ITS, PC-8, PC-9, UC-1, UC-3
5	IoT/CPS software development	C	6,00	6,00		GPC-3.ITS, GPC-4.ITS, PC-10, PC-8, UC-1, UC-5
6	Network Technologies in Machine-to-Machine (M2M) Communications	C	6,00	6,00		GPC-1.ITS, GPC-3.ITS, PC-2, PC-3, UC-1, UC-3
	Magolego					

**Curriculum agreed:**

Academic Supervisor                      IVANOV I.A.    15.05.2023

Dean    KROUK E.A.    15.05.2023

Head of Centre for  
Educational Model Design                      LEPESHKIN I.A.    18.05.2023

\* Subject type:

Compulsory course                      C

Elective course                      E