



National Research University Higher School of Economics (HSE)

Curriculum

Field of study 01.04.04 Applied Mathematics,
01.04.02 Applied Mathematics and Informatics

Educational Programme "Systems Analysis and Mathematical
Technologies"

Trajectories: "Applied Artificial Intelligence Models",
"Management Systems and Information Processing",
"Mathematical Methods and Computer Technologies",
"Supercomputer Simulations in Science and Engineering"

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

2 nd, 2023/2024 academic year

APPROVED

22.03.2023

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Length of Programme: 2 years

Years of Study: 2022/2023 - 2023/2024

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	158	42	64	54	4	
Mathematical Methods and Computer Technologies (Research track)				60,00	2 280	164	42	64	54	4	
Major				12,00	456	108	28	48	32		
1	Methods and Tools for Big Data Processing	E	Department of Applied Mathematics	6,00	228	52		20	32A		
2	Multiscale Modeling and Supercomputer Architectures	E	Department of Applied Mathematics	6,00	228	56	28	28A			Foreign language
3	Basics of cybersecurity	E	Department of Applied Mathematics	6,00	228	30	16	14A			Online Course
Final State Certification (FSC)				3,00	114	2				2	
1	Final Qualification Paper	C		3,00	114	2				2A	
Key Seminars				9,00	342	50	14	16	20		
1	Mathematical methods and computer technology (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A		
Magolego				12,00	456						
1	All-university Pool MAGOLEGO Courses	E		12,00	456						
Internship				24,00	912	4			2	2	
Research Internship				15,00	570	2				2	
1	Graduation Thesis	C		15,00	570	2				2	
Professional Internship				9,00	342	2			2		

1	Work Experience Internship	C		9,00	342	2			2A	
Mathematical Methods and Computer Technologies (Applied track)				60,00	2 280	138	58	50	74	4
Major				12,00	456	82	44	34	52	
1	Methods and Tools for Big Data Processing	E	Department of Applied Mathematics	6,00	228	52		20	32A	
2	Multiscale Modeling and Supercomputer Architectures	E	Department of Applied Mathematics	6,00	228	56	28	28A		Foreign language
3	Basics of cybersecurity	E	Department of Applied Mathematics	6,00	228	30	16	14A		Online Course
Final State Certification (FSC)				3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
Key Seminars				9,00	342	50	14	16	20	
1	Mathematical methods and computer technology (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A	
Magolego				12,00	456					
1	All-university Pool MAGOLEGO Courses	E		12,00	456					
Internship				24,00	912	4			2	2
Research Internship				15,00	570	2				2
1	Graduation Thesis	C		15,00	570	2				2
Professional Internship				9,00	342	2			2	
1	Work Experience Internship	C		9,00	342	2			2A	
Applied Artificial Intelligence Models (Applied track)				60,00	2 280	234	100	112	18	4
Major				24,00	912	190	90	100		
Elective Courses				6,00	228	30	16	14		
1	Introduction to Deep Learning in NLP	E	School of Linguistics	6,00	228	32	16	16A		Foreign language
2	Basics of cybersecurity	E	Department of Applied Mathematics	6,00	228	30	16	14A		Online Course
Compulsory Courses				18,00	684	160	74	86		
1	Big data distributed processing with Hadoop	C	Department of Applied Mathematics	6,00	228	60		28	32A	
2	Modern data storage technologies	C	Department of Applied Mathematics	6,00	228	40	18	22A		
3	Advanced Programming in Python	C	Department of Applied Mathematics	6,00	228	60	28	32A		
Final State Certification (FSC)				3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
Key Seminars				6,00	228	36	10	12	14	
1	Applied Artificial Intelligence Models	C	Department of Applied Mathematics	6,00	228	36	10A	12	14A	
Magolego				6,00	228					
1	All-university Pool MAGOLEGO Courses	E		6,00	228					
Internship				21,00	798	6			4	2
Research Internship				9,00	342	2				2
1	Graduation Thesis	C		9,00	342	2				2

	Project Internship			3,00	114	2			2	
1	Project	E		3,00	114	2			2A	
	Professional Internship			9,00	342	2			2	
1	Work Experience Internship	C		9,00	342	2			2A	
	Management Systems and Information Processing in Engineering (Research track)			60,00	2 280	172	50	64	90	4
	Major			12,00	456	116	36	48	68	
1	Network Modeling	E	Department of Applied Mathematics	6,00	228	68		28	40A	
2	Basics of cybersecurity	E	Department of Applied Mathematics	6,00	228	30	16	14A		Online Course
3	Management Information System Design	E	Department of Applied Mathematics	6,00	228	40	20	20A		
	Final State Certification (FSC)			3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
	Key Seminars			9,00	342	50	14	16	20	
1	Control and information processing systems (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A	
	Magolego			12,00	456					
1	All-university Pool MAGOLEGO Courses	E		12,00	456					
	Internship			24,00	912	4			2	2
	Research Internship			15,00	570	2				2
1	Graduation Thesis	C		15,00	570	2				2
	Professional Internship			9,00	342	2			2	
1	Work Experience Internship	C		9,00	342	2			2A	
	Management Systems and Information Processing in Engineering (Applied track)			60,00	2 280	162	50	86	22	4
	Major			12,00	456	106	36	70		
1	Network Modeling	E	Department of Applied Mathematics	6,00	228	68		28	40A	
2	Basics of cybersecurity	E	Department of Applied Mathematics	6,00	228	30	16	14A		Online Course
3	Management Information System Design	E	Department of Applied Mathematics	6,00	228	40	20	20A		
	Final State Certification (FSC)			3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
	Key Seminars			9,00	342	50	14	16	20	
1	Control and information processing systems (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A	
	Magolego			12,00	456					
1	All-university Pool MAGOLEGO Courses	E		12,00	456					
	Internship			24,00	912	4			2	2
	Research Internship			15,00	570	2				2
1	Graduation Thesis	C		15,00	570	2				2
	Professional Internship			9,00	342	2			2	
1	Work Experience Internship	C		9,00	342	2			2A	

Supercomputer Simulations in Science and Engineering (Research track)				60,00	2 280	176	66	72	22	4
Major				12,00	456	120	52	56		
1	Models of Complex Systems	E	Department of Applied Mathematics	6,00	228	52	24	28A		
2	Management Information System Design	E	Department of Applied Mathematics	6,00	228	40	20	20A		
3	Numerical methods of optimization	E	Joint Department of Information and Communication Facilities and Systems with RAS Dorodnitsyn Computing Centre	6,00	228	56	28	28A		
Final State Certification (FSC)				3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
Key Seminars				9,00	342	50	14	16	20	
1	Supercomputer Simulation in Science and Engineering (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A	
Magolego				12,00	456					
1	All-university Pool MAGOLEGO Courses	E		12,00	456					
Internship				24,00	912	4			2	2
Research Internship				15,00	570	2				2
1	Graduation Thesis	C		15,00	570	2				2
Professional Internship				9,00	342	2			2	
1	Work Experience Internship	C		9,00	342	2			2A	
Supercomputer Simulations in Science and Engineering (Applied track)				60,00	2 280	152	62	64	22	4
Major				12,00	456	96	48	48		
1	Models of Complex Systems	E	Department of Applied Mathematics	6,00	228	52	24	28A		
2	Management Information System Design	E	Department of Applied Mathematics	6,00	228	40	20	20A		
3	Numerical methods of optimization	C	Joint Department of Information and Communication Facilities and Systems with RAS Dorodnitsyn Computing Centre	6,00	228	56	28	28A		
Final State Certification (FSC)				3,00	114	2				2
1	Final Qualification Paper	C		3,00	114	2				2A
Key Seminars				9,00	342	50	14	16	20	
1	Supercomputer Simulation in Science and Engineering (mentor seminar)	C	Department of Applied Mathematics	9,00	342	50	14A	16	20A	
Magolego				12,00	456					
1	All-university Pool MAGOLEGO Courses	E		12,00	456					
Internship				24,00	912	4			2	2
Research Internship				15,00	570	2				2

1	Graduation Thesis	C		15,00	570	2				2	
Professional Internship				9,00	342	2			2		
1	Work Experience Internship	C		9,00	342	2			2A		

Curriculum agreed:

Academic Supervisor	SLASTNIKOV S.A.	03.03.2023
Dean	KROUK E.A.	03.03.2023
Head of Centre for Educational Model Design	LEPESHKIN I.A.	20.03.2023

* Subject type:

Compulsory course

C

Elective course

E