



Basic Curriculum

Speciality 10.05.01 Cyber Security

Educational Programme "Cyber Security"

Specializations: "Mathematical methods of information security"

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

APPROVED  
09.02.2023  
Vice Rector  
ROSHCHIN S.Y.  
Signed with EDS

Years of Study: 2021/2022 - 2026/2027

Length of Programme: 5 years 6 months

Mode of Study: Full Time

Degree: Specialist's degree

Block Code	Course	Subject type	Credits	Credits by Years						Planned Educational Programme Development Results
				1	2	3	4	5	6	
	Вся образовательная программа		330,00	60,00	60,00	60,00	60,00	60,00	30,00	
	Internship		42,00		4,00	4,00	10,00		24,00	
	Проектная		12,00		4,00	4,00	4,00			
1	Проект	C	12,00		4,00	4,00	4,00			, GPC-5, GPC-8, PC-4, PC-6, UC-9
	Научно-исследовательская		24,00						24,00	
1	Cryptographic Methods of Information Security	C								, GPC-10, GPC-18, PC-8, PC-9
2	Graduation Internship	C	8,00						8,00	, GPC-1, GPC-10, GPC-11, GPC-12, GPC-13, GPC-14, GPC-15, GPC-16, GPC-17, GPC-18, GPC-19, GPC-2, GPC-20, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-10, UC-7, UC-9
3	Подготовка выпускной квалификационной работы	C	16,00						16,00	, GPC-1, GPC-10, GPC-11, GPC-12, GPC-13, GPC-14, GPC-15, GPC-16, GPC-17, GPC-18, GPC-19, GPC-2, GPC-20, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-10, UC-7, UC-9
	Профессиональная		6,00				6,00			
1	Work Experience Internship	C	6,00				6,00			, GPC-1, GPC-10, GPC-11, GPC-12, GPC-13, GPC-14, GPC-15, GPC-16, GPC-17, GPC-18, GPC-19, GPC-2, GPC-20, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-10, UC-7, UC-9
	Major		244,00	52,00	45,00	42,00	46,00	59,00		
	Elective Components		81,00	4,00	9,00	12,00	27,00	29,00		
1	Cryptographic Methods of Information Security	C	7,00				7,00			, GPC-10, GPC-18, PC-8, PC-9

2	English for Research and Publication Purposes (offered in a foreign language)	C	3,00				3,00		
3	Project Seminar	C	3,00				3,00		, GPC-5, GPC-8, PC-4, PC-6, UC-9
4	Introduction to Number Theory	C	4,00	4,00					, GPC-3, GPC-8, PC-8, PC-9
5	History of Cryptography	C	3,00		3,00				, GPC-1, GPC-17, PC-1, PC-8
6	Computer Mathematics: Supplementary Chapters (offered in a foreign language)	C	3,00		3,00				, GPC-1, GPC-8, PC-8, PC-9
7	Basics of Information Security	C	3,00		3,00				, GPC-3, GPC-4, PC-8, PC-9
	<b>Elective Courses</b>		<b>28,00</b>				<b>14,00</b>	<b>14,00</b>	
	<b>Elective Courses 1</b>		<b>14,00</b>				<b>14,00</b>		
1	Methods for searching for vulnerabilities and penetration into information systems	E	4,00				4,00		PC-9
2	Information Security Management	E	3,00				3,00		, GPC-11, GPC-13, PC-9
3	How to Process and Store Big Data and Machine Learning	E	3,00				3,00		, GPC-11, GPC-13, PC-1, PC-9
4	Microcontroller Systems	E	4,00				4,00		GPC-15
5	Implementation Analysis of Information Security Algorithms	E	4,00					4,00	, GPC-10, GPC-16, PC-8, PC-9
6	Methods of Synthesis and Analysis of Modern Cryptographic Algorithms	E	4,00					4,00	, GPC-10, GPC-16, PC-8, PC-9
	<b>Elective Courses 2</b>		<b>14,00</b>				<b>14,00</b>		
1	Theory of Coding, Compression and Data Recovery	E	4,00				4,00		PC-8
2	Methods of Information Security in Financial and Banking Activities	E	3,00				3,00		PC-3
3	Number Theory Methods in Cryptography	E	4,00				4,00		PC-9
4	Theory of Pseudo-random Generators	E	3,00				3,00		PC-2
5	Quantum Computations	E	4,00					4,00	, GPC-10, GPC-16, PC-8, PC-9
6	Methods of Algebraic Geometry in Cryptography	E	4,00					4,00	, GPC-10, GPC-16, PC-8, PC-9
9	Parallel Computing	C	5,00					5,00	, GPC-2, GPC-7, PC-3, PC-8
10	Intrusion Detection Systems	C	5,00					5,00	, GPC-2, GPC-7, PC-3, PC-8
11	Modern technology of digital workflow (offered in a foreign language)	C	5,00					5,00	, GPC-2, GPC-7, PC-3, PC-8
12	Differential Equations	C	3,00			3,00			, GPC-3, GPC-8, PC-1, PC-9
13	Python Programming Language	C	3,00			3,00			, GPC-2, GPC-7, PC-3, PC-8
14	Methods of Data Analysis	C	3,00			3,00			, GPC-10, GPC-3, PC-1, PC-9
15	Assembly Language	C	3,00			3,00			, GPC-7, GPC-9, PC-3, PC-9
	<b>Basic</b>		<b>163,00</b>	<b>48,00</b>	<b>36,00</b>	<b>30,00</b>	<b>19,00</b>	<b>30,00</b>	
	<b>по математике</b>		<b>65,00</b>	<b>26,00</b>	<b>30,00</b>	<b>9,00</b>			
1	English for Specific Purposes. IT and Cyber Security (offered in a foreign language)	C	3,00			3,00			, GPC-6, GPC-9, UC-10, UC-9
2	Calculus	C	19,00	10,00	9,00				, GPC-3, GPC-8, PC-8, PC-9
3	Algebra	C	7,00	7,00					, GPC-3, GPC-8, PC-8, PC-9
4	Geometry	C	4,00	4,00					, GPC-3, GPC-8, PC-8, PC-9
5	Physics	C	8,00	5,00	3,00				, GPC-1, GPC-4, PC-1, PC-3
6	Probability Theory	C	3,00		3,00				, GPC-10, GPC-3, PC-1, PC-9
7	Mathematical Logic and Theory of Algorithms	C	3,00		3,00				, GPC-3, GPC-8, PC-8, PC-9
8	Discrete Mathematics	C	3,00		3,00				, GPC-3, GPC-8, PC-1, PC-9
9	Electronics and Circuit Engineering	C	6,00		3,00	3,00			, GPC-4, GPC-9, PC-3, PC-4

10	Algebra	C	6,00		6,00					, GPC-3, GPC-8, PC-8, PC-9
11	Mathematical Statistics	C	3,00			3,00				, GPC-10, GPC-3, PC-1, PC-9
	по информатике и программированию		54,00	22,00	3,00	13,00	11,00	5,00		
1	Systems and Networks of Information Transfer	C	4,00				4,00			, GPC-4, GPC-8, PC-1, PC-9
2	Computer Networks	C	3,00				3,00			, GPC-14, GPC-6
3	Computer Science	C	5,00	5,00						, GPC-1, GPC-3, PC-1, PC-8
4	Programming Languages	C	16,00	13,00	3,00					, GPC-1, GPC-7, PC-3, PC-8
5	Hardware Computer Technology	C	4,00	4,00						, GPC-1, GPC-7, PC-3, PC-8
6	Basics of Building Protected Computer Networks	C	5,00					5,00		, GPC-11, GPC-15, PC-1, PC-9
7	Programming Techniques (offered in a foreign language)	C	3,00			3,00				, GPC-2, GPC-7, PC-3, PC-8
8	Programming Logic Integrated Circuits	C	3,00			3,00				GPC-6, GPC-7
9	Operating Systems	C	11,00			7,00	4,00			, GPC-7, GPC-9, PC-2, PC-9
	по компьютерной безопасности		44,00		3,00	8,00	8,00	25,00		
1	Computer Security Models	C	5,00				5,00			, GPC-11, GPC-13, PC-1, PC-3
2	Database Management Systems (offered in a foreign language)	C	3,00				3,00			, GPC-12, GPC-14, PC-3, PC-8
3	Organizational and Legal Support for Information Security	C	3,00		3,00					, GPC-1, GPC-5, PC-4, PC-7, UC-10
4	Technical Protection of Information	C	5,00					5,00		, GPC-16, GPC-9, PC-3, PC-7
5	Operating Systems Security	C	5,00					5,00		, GPC-12, GPC-9, PC-2, PC-3
6	Software and Data Security	C	5,00					5,00		, GPC-11, GPC-13, PC-3, PC-9
7	Cryptographic Protocols	C	5,00					5,00		, GPC-19, GPC-20, PC-8, PC-9
8	Servers and Workstations Security	C	5,00					5,00		, GPC-10, GPC-18, PC-8, PC-9
9	Information Theory	C	3,00			3,00				GPC-10, GPC-8, GPC-9
10	Machine Learning (offered in a foreign language)	C	5,00			5,00				GPC-10, GPC-11, GPC-12
	ДОЦ		13,00	5,00	1,00	4,00	3,00			
	Обязательные дисциплины ДОЦ		2,00	1,00	1,00					
1	Physical Training	C	1,00		1,00					UC-7
2	Safe Living Basics	C	1,00	1,00						
	Дополнительные дисциплины ДОЦ		11,00	4,00		4,00	3,00			
1	Philosophy	C	3,00				3,00			, GPC-11, GPC-17, PC-4, PC-9
2	History	C	4,00	4,00						, GPC-1, GPC-17, UC-10
3	Economics	C	4,00			4,00				GPC-1, GPC-8, PC-8, UC-10, UC-9
	Minor		20,00		10,00	10,00				
1	Minor	E	20,00		10,00	10,00				GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6
	Final State Certification		6,00						6,00	
1	Защита выпускной квалификационной работы	C	4,00						4,00	, GPC-1, GPC-10, GPC-11, GPC-12, GPC-13, GPC-14, GPC-15, GPC-16, GPC-17, GPC-18, GPC-19, GPC-2, GPC-20, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-10, UC-7, UC-9

2	Государственный междисциплинарный экзамен	C	2,00					2,00	, GPC-1, GPC-10, GPC-11, GPC-12, GPC-13, GPC-14, GPC-15, GPC-16, GPC-17, GPC-18, GPC-19, GPC-2, GPC-20, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-10, UC-7, UC-9
	English		1,00					1,00	
	Дополнительные факультативные учебные дисциплины								
1	Academic Writing (offered in a foreign language)	O	2,00					2,00	
2	Английский язык	O	14,00	8,00	6,00				
	Экзамены		1,00					1,00	
1	Independent English Exam (offered in a foreign language)	C							
2	English Language Integrative Exam (offered in a foreign language)	C							
3	Project Proposal	C	1,00					1,00	
	Data Culture		4,00	3,00				1,00	
1	Independent Programming Test. Intermediate	C							, GPC-1, GPC-3, PC-1, PC-8
2	Data Science, AI and Generative Models Independent Test. Intermediate	C	1,00				1,00		, GPC-1, GPC-3, PC-1, PC-8
3	Data-Culture	C	3,00	3,00					, GPC-1, GPC-3, PC-1, PC-8
4	Independent Digital Literacy Test	C							, GPC-1, GPC-3, PC-1, PC-8

**Curriculum agreed:**

Academic Supervisor                      LOS A.B.    02.02.2023

Dean    KROUK E.A.    02.02.2023

Head of Centre for  
Educational Model Design                      LEPESHKIN I.A.    07.02.2023

\* Subject type:

Compulsory course                      C  
Elective course                              E  
Optional course                              O