



Basic Curriculum

Speciality 10.05.01 Cyber Security

Educational Programme "Cyber Security"

Specializations: "Development of Secure Software", "Mathematical Methods of Information Security"

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

APPROVED  
31.05.2023  
Vice Rector  
ROSHCHIN S.Y.  
Signed with EDS

Years of Study: 2023/2024 - 2028/2029

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	
	Degree Programme		330,00	60,00	60,00	60,00	60,00	60,00	30,00	
	Major		241,00	50,00	45,00	43,00	48,00	55,00		
	Core Professional Block (Major)		151,00	47,00	36,00	28,00	7,00	33,00		
1	Algebra	C	6,00		6,00					GPC-3
2	History of Cryptography	C	3,00		3,00					GPC-10, GPC-5
3	Mathematical Logic and Theory of Algorithms	C	3,00		3,00					GPC-3
4	Organizational and Legal Support for Information Security	C	3,00		3,00					GPC-11, GPC-9
5	Probability Theory	C	3,00		3,00					GPC-3
6	Electronics	C	3,00		3,00					GPC-4
7	Hardware Computer Technology	C	3,00	3,00						GPC-1, GPC-7, PC-3, PC-8, UC-1, UC-3
8	Geometry	C	3,00	3,00						GPC-3, GPC-8, PC-8, PC-9, UC-1, UC-6
9	Discrete Mathematics	C	4,00	4,00						GPC-3, GPC-8, PC-1, PC-9, UC-1, UC-6
10	Computer Science	C	6,00	6,00						GPC-1, GPC-4, PC-1, PC-3, UC-4
11	Linear Algebra	C	6,00	6,00						GPC-3, GPC-8, PC-8, PC-9, UC-1, UC-6
12	Calculus	C	18,00	9,00	9,00					GPC-3, GPC-8, PC-8, PC-9, UC-1, UC-6
13	Physics	C	9,00	6,00	3,00					GPC-1, GPC-4, PC-1, PC-3, UC-1, UC-3
14	Programming Languages	C	13,00	10,00	3,00					GPC-1, GPC-7, PC-3, PC-8, UC-3, UC-4
15	Circuit Engineering	C	3,00			3,00				GPC-4, GPC-9, PC-3, PC-4, UC-1, UC-3
16	Mathematical Statistics	C	4,00			4,00				GPC-10, GPC-3, PC-1, PC-9, UC-1, UC-3
17	Information Theory	C	4,00			4,00				GPC-1, GPC-3, PC-1, PC-9, UC-1, UC-6
18	Programming Techniques (offered in a foreign language)	C	3,00			3,00				GPC-2, GPC-7, PC-3, PC-8, UC-4, UC-5
19	Operating Systems	C	11,00			7,00	4,00			GPC-7, GPC-9, PC-2, PC-9, UC-3, UC-4
20	Computer Networks	C	3,00				3,00			GPC-14, GPC-6, PC-1, PC-9, UC-1, UC-3
21	Basics of Building Protected Computer Networks	C	3,00					3,00		GPC-11, GPC-15, PC-1, PC-9, UC-3
22	Technical Protection of Information	C	6,00					6,00		GPC-16, GPC-9, PC-3, PC-7, UC-1, UC-3

23	Operating Systems Security	C	3,00					3,00	GPC-12, GPC-9, PC-2, PC-3, UC-1, UC-6
24	Software and Data Security	C	5,00					5,00	GPC-11, GPC-13, PC-3, PC-9, UC-3
25	Cryptographic Protocols	C	5,00					5,00	GPC-19, GPC-20, PC-8, PC-9, UC-1
26	Servers and Workstations Security	C	3,00					3,00	GPC-10, GPC-18, PC-8, PC-9, UC-3
27	Programming of Information Security Algorithms	C	8,00					8,00	GPC-1, GPC-3, PC-1, PC-3, UC-1, UC-3
28	Programming Logic Integrated Circuits	C	3,00			3,00			GPC-12, GPC-16
29	Machine Learning	C	4,00			4,00			GPC-3, PC-8
Elective Professional Block (Major)			90,00	3,00	9,00	15,00	41,00	22,00	
Дисциплины по выбору ОП			53,00	3,00	9,00	15,00	26,00		
1	Computer Mathematics: Supplementary Chapters (offered in a foreign language)	C	3,00		3,00				GPC-3
2	Basics of Information Security	C	3,00		3,00				GPC-5, GPC-6
3	Assembly Language	C	3,00		3,00				GPC-7
4	Introduction to Number Theory	C	3,00	3,00					GPC-3, GPC-8, PC-8, PC-9, UC-1, UC-6
5	Modern technology of digital workflow	C	3,00			3,00			GPC-2, GPC-4, PC-3, PC-5, UC-1, UC-3
6	Differential Equations	C	3,00			3,00			GPC-3, GPC-8, PC-1, PC-9, UC-1, UC-3
7	Python Programming Language	C	3,00			3,00			GPC-3, GPC-8, PC-1, PC-9, UC-1, UC-3
8	Methods of Data Analysis	C	3,00			3,00			GPC-10, GPC-3, PC-1, PC-9, UC-1, UC-3
9	English for Specific Purposes. IT and Cyber Security (offered in a foreign language)	C	3,00			3,00			UC-4
10	English for Professional Communication (offered in a foreign language)	C	3,00				3,00		UC-4
11	Cryptographic Methods of Information Security	C	8,00				8,00		GPC-10, GPC-18, PC-8, PC-9, UC-1
12	Asymmetric encryption schemes	C	6,00				6,00		GPC-2, GPC-4, PC-3, PC-5, UC-1, UC-3
13	Systems and Networks of Information Transfer	C	3,00				3,00		GPC-4, GPC-5, GPC-8, PC-1, PC-9, UC-1, UC-3
14	Computer Security Models	C	3,00				3,00		GPC-11, GPC-13, PC-1, PC-3, UC-10, UC-6
15	Microcontroller Systems	C	3,00				3,00		GPC-2, GPC-4, PC-3, PC-5, UC-1, UC-3
Блоки дисциплин по выбору (1 из 2)			37,00				15,00	22,00	
Блок 1			37,00				15,00	22,00	
1	Database Management Systems (offered in a foreign language)	C	3,00				3,00		GPC-12, GPC-14, PC-3, PC-8, UC-1, UC-3
2	Information Security Management	C	3,00				3,00		GPC-11, GPC-13, PC-7, UC-2, UC-3
3	Methods of Information Security in Financial and Banking Activities	C	3,00				3,00		GPC-11, GPC-14, PC-4, PC-9, UC-2, UC-3
4	Information security audit	C	3,00				3,00		GPC-11, GPC-14, PC-4, PC-9, UC-2
5	Project Seminar	C	6,00				3,00	3,00	GPC-5, GPC-8, PC-4, PC-6, UC-2, UC-9
6	Parallel Computing	C	6,00					6,00	GPC-2, GPC-7, PC-3, PC-8, UC-3, UC-4
7	Intrusion Detection Systems	C	3,00					3,00	GPC-2, GPC-7, PC-3, PC-8, UC-3, UC-4
8	Implementation Analysis of Information Security Algorithms	C	5,00					5,00	GPC-5, GPC-6, PC-5, PC-6, UC-5, UC-7
9	IT Infrastructure	C	5,00					5,00	GPC-4, GPC-5, PC-6, PC-7, UC-3, UC-4
Блок 2			37,00				15,00	22,00	
1	Number Theory Methods in Cryptography	C	3,00				3,00		GPC-10, GPC-18, PC-8, PC-9, UC-1
2	Theory of Coding, Compression and Data Recovery	C	3,00				3,00		GPC-2, GPC-4, PC-3, PC-5, UC-1, UC-3

3	How to Process and Store Big Data and Machine Learning	C	3,00				3,00			GPC-11, GPC-13, PC-1, PC-9, UC-2, UC-3
4	Methods of Algebraic Geometry in Cryptography	C	3,00				3,00			GPC-10, GPC-16, PC-8, PC-9, UC-3
5	Project Seminar	C	6,00				3,00	3,00		GPC-5, GPC-8, PC-4, PC-6, UC-2, UC-9
6	Methods of Synthesis and Analysis of Modern Cryptographic Algorithms	C	6,00					6,00		GPC-10, GPC-16, PC-8, PC-9, UC-3, UC-6
7	Quantum Computations	C	3,00					3,00		GPC-10, GPC-16, PC-8, PC-9, UC-3
8	Legal Regime of Personal Data	C	5,00					5,00		GPC-5, GPC-6, PC-6, PC-7, UC-5, UC-6
9	Introduction to quantum algorithms	C	5,00					5,00		GPC-10, GPC-11, PC-6, PC-7, UC-6
	Internship		44,00		4,00	4,00	8,00	5,00	23,00	
	Research Internship		23,00						23,00	
1	Preparation of Graduation Thesis	C	15,00						15,00	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-1, UC-10, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-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-1, UC-10, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
3	Organizational and Legal Support for Information Security	C								GPC-11, GPC-9
4	Basics of Information Security	C								GPC-5, GPC-6
	Project Internship		17,00		4,00	4,00	4,00	5,00		
1	Research or Applied Project	C	17,00		4,00	4,00	4,00	5,00		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
	Professional Internship		4,00					4,00		
1	Work Experience Internship	C	4,00					4,00		PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9
	General Courses		14,00	7,00	1,00	3,00	3,00			
	Core General Courses		2,00	1,00	1,00					
1	Safe Living Basics	C	1,00	1,00						UC-3, UC-8
2	Physical Training	C	1,00		1,00					UC-7
	Optional General Courses		12,00	6,00		3,00	3,00			
1	Russian History	C	4,00	4,00						UC-5
2	Foundations of Russian Statehood	C	2,00	2,00						UC-10, UC-9
3	Law	C	3,00					3,00		UC-10
4	Economics	C	3,00			3,00				UC-10
	Minor		20,00		10,00	10,00				
1	Minor	E	20,00		10,00	10,00				GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2
	English		1,00						1,00	

	Examinations		1,00					1,00	
1	English Language Integrative Exam (offered in a foreign language)	C							UC-4
2	Independent English Exam (offered in a foreign language)	C							UC-4
3	Project Proposal (offered in a foreign language)	C	1,00					1,00	UC-4
	Optional Courses								
1	English (offered in a foreign language)	O	14,00	8,00	6,00				UC-4
2	Academic Writing (offered in a foreign language)	O	2,00				2,00		UC-4
	Data Culture		4,00	3,00			1,00		
1	External Examinations on Digital Skills. Entry-level	C							GPC-2
2	External Examinations on Digital Skills. Intermediate Level	C							GPC-2
3	Independent Programming Test. Intermediate	C							GPC-2, GPC-7, PC-3, PC-8, UC-3, UC-4
4	External Examinations on Digital Skills. Final Level	C							
5	Data-Culture	C	3,00	3,00					GPC-1
6	Data Science, AI and Generative Models Independent Test. Intermediate	C	1,00				1,00		GPC-11, GPC-12
7	Independent Digital Literacy Test	C							GPC-1
	Final State Certification (FSC)		6,00					6,00	
	Thesis Work		4,00					4,00	
1	Presenting of Graduation Thesis	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-1, UC-10, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9
	Государственный экзамен		2,00					2,00	
1	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-1, UC-10, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9

**Curriculum agreed:**

Academic Supervisor                      LOS A.B.    02.05.2023

Dean    KROUK E.A.    02.05.2023

Head of Centre for Educational Model Design                      LEPESHKIN I.A.    30.05.2023

\* Subject type:

Compulsory course

C

Elective course

E

Optional course

O