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CATALOG OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAMME **6B06328 – Information Security Systems**

Level of education: bachelor **Duration of study: 3 years** **Year of admission: 2026**

Cycle	Component	Name of discipline	Total workload		Semester	Learning outcomes	Short description of discipline	Prerequisites	Postrequisites
			academic hours	academic credits					
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Module of natural science competencies									
BD	UC	Engineering Mathematics	150	5	1	LO2	The discipline "Engineering Mathematics" is designed to provide students with fundamental mathematical knowledge and skills necessary to solve applied problems in engineering and technical fields. The course covers the main sections of linear algebra, analytical geometry, differential and integral calculus of a function of one variable. The discipline studies mathematical methods used in the analysis, modeling and optimization of technical systems, which are key competencies for future engineers. Within the framework of the discipline, methods of interactive learning and the performance of computational and graphical work are used.	Basic school knowledge of mathematics	Discrete mathematics, Data visualization methods and their application
BD	UC	Personal data protection	150	5	2	LO2	The aspects of collecting, storing, processing and transferring personal information are considered. Knowledge is formed about the principles and methods of personal data protection, including legal requirements and best practices. Skills are acquired in developing and implementing security policies,	Introduction to information security	Identification and access management (IAM)

							conducting risk assessments and incidents related to data leaks and unauthorized access to personal information.		
BD	UC	Introduction to information security	150	5	1	LO2, LO8	Knowledge of key concepts of information security, including threats, vulnerabilities and methods of information protection, basic principles of confidentiality, integrity and accessibility of data are considered. Approaches to risk management, as well as the development of security policies and procedures, are being studied. The methods of authentication, encryption and access control, the role of legislation and ethics in the field of information security are discussed	Basic school knowledge of computer science	Personal data protection, Cryptography and Security Protocols, Introduction to cybersecurity, Information Security Protocols, Operating systems and OS security, Educational practice, Databases and their security, Computer information protection technologies
BD	UC	Discrete mathematics	120	4	2	LO2	The key concepts of discrete mathematics, including set theory, combinatorics, graphs and algorithms, are considered. Methods of logical inference, properties of finite automata and principles of algorithm construction are studied. The skills of analyzing discrete structures and solving problems related to graphs and combinatorial problems are being formed. The acquired knowledge is used to solve practical problems in computer science and other related fields.	Engineering Mathematics	Cryptography and Security Protocols, Information Security Protocols
Professional module									
BD	UC	Python programming language	180	6	3	LO5	Knowledge about the Python programming language is being formed, including its syntax and basic constructions. Data types, operators, functions and modules are considered. Libraries for data analysis, web development and automation are being studied. The skills of developing software applications, writing effective and structured code to solve practical problems are acquired.	Fundamentals of algorithmization and programming	Data visualization methods and their application, Software and mobile application security, Artificial intelligence methods in information security, Industrial practice 1
BD	UC	Fundamentals of algorithmization and	150	5	1	LO4, LO5	As a result of studying the discipline, the student will be able to: form methods for developing	Basic school knowledge of	Python programming language, Operating

		programming					algorithms and data processing in the C++ programming language, describe methods for creating algorithms and their full use, classify sorting methods, processing arrays, write code in a programming language, create an application in a programming environment. Within the framework of the discipline, methods of active learning are used - case assignments, "brainstorming".	computer science	systems and OS security, Educational practice, Databases and their security
BD	UC	Cryptography and Security Protocols	150	5	4	LO4, LO8	Knowledge is formed in the field of cryptography and data protection. Methods of encryption, authentication, digital signatures, and key management are discussed. Modern security protocols such as TLS, IPsec, and PGP are studied, along with methods for preventing attacks to ensure data confidentiality and integrity.	Discrete mathematics, Introduction to information security	Intrusion prevention and detection systems
BD	UC	Attack prevention and detection systems	150	5	5	LO3, LO9	The knowledge of the key principles and methods of network and cybersecurity, including intrusion prevention and detection systems (IDS/IPS), is considered. Architectures, technologies and algorithms for monitoring network traffic and analyzing suspicious activities are being studied. Practical skills are acquired in configuring, administering and evaluating the effectiveness of IDS/IPS to protect information systems from intrusions and threats in the digital space.	Introduction to cybersecurity, Operating systems and OS security	Industrial practice 2/ Pre-graduation practice
BD	UC	Introduction to cybersecurity	150	5	3	LO3	Knowledge is being formed about the principles and methods of cybersecurity, including the analysis of threats and vulnerabilities of information systems. Modern cyber attacks and security measures are considered, as well as the importance of ensuring confidentiality, integrity and availability of data. Skills are acquired in developing security strategies and incident management in the digital space.	Introduction to information security	Intrusion prevention and detection systems, Security in cloud computing, Network security, Industrial practice 1
Programming and Information Security module									
BD	UC	Standardization and Regulatory Support of Information Security	90	3	1	LO1, LO9	The discipline is aimed at studying the regulatory, legal, and organizational foundations of information security. The course covers national and international standards, information protection requirements, methods of certification and security system auditing, as well as issues related to compliance with established regulations and requirements. The acquired knowledge enables	Basic school knowledge of law	Personal data protection

							effective organization and control of information protection processes in modern information systems.		
BD	UC	Information Security Protocols	90	3	3	LO2, LO4, LO8	The discipline is aimed at studying protocols and technologies for ensuring information security in computer networks and information systems. The course covers methods of data protection during transmission and storage, authentication mechanisms, encryption, access control, and secure interaction between users and systems. It also examines modern cryptographic protocols and tools that ensure the confidentiality, integrity, and availability of information.	Introduction to information security, Discrete mathematics	Network security, Identification and access management (IAM)
BD	UC	Operating systems and OS security	120	4	3	LO4	Understanding the fundamentals of operating systems and methods for ensuring their security is developed. The architecture of OS, process management, memory management, and file systems are discussed. Security threats, protection mechanisms, and data protection methods are studied, along with tools for monitoring and managing OS security.	Fundamentals of algorithmization and programming, Introduction to information security	Intrusion prevention and detection systems, Security in cloud computing, Software and mobile application security
Practice-oriented module									
BD	UC	Educational practice	60	2	2	LO 1 – LO 12	The Organization of Educational Practice Is Aimed at Ensuring Familiarization of Bachelors with the Main Areas, Objects, Areas of Professional Activity and Profiles of Training and Consolidation of Theoretical Material, as Well as Conducting Study Tours in the Branch of the Department for This Educational Program.	Fundamentals of algorithmization and programming, Introduction to information security	Industrial practice 1
Professional module									
PD	UC	Data visualization methods and their application	180	6	5	LO1	The discipline focuses on the study of data visualization and interpretation methods using various technologies. Students will learn how to represent, model, and display stereoscopic images, surfaces, attributes, and animations. The training process will focus on the use of graphics, image processing, computer vision, and user interface development for effective data visualization.	Python programming language, Engineering Mathematics	Industrial practice 2/ Pre-graduation practice
PD	UC	Security in cloud computing	120	4	4	LO4	Knowledge is being formed about security methods in cloud computing, including encryption, access control and data management. Threats related to multi-tenant architecture, confidentiality and data	Introduction to cybersecurity, Operating systems and OS security	Intrusion prevention and detection systems

							transfer security are considered. Skills are acquired in developing strategies to protect cloud infrastructures, prevent information leaks and ensure reliable operation of cloud services.		
PD	UC	Network security	150	5	5	LO3	Key concepts of network security are considered, including types of attacks, intrusion prevention and access control methods. Security protocols such as VPN, SSL/TLS and IPsec are being studied, as well as firewalls, intrusion detection and prevention systems (IDS/IPS) and data encryption technologies. Practical skills are being developed in configuring and administering network devices to ensure security, analyze network threats and respond to incidents.	Information Security Protocols, Introduction to cybersecurity	Industrial practice 2/ Pre-graduation practice
PD	UC	Databases and their security	150	5	3	LO7	Knowledge is formed about the principles of database design and management, including data models and the SQL language. Database security aspects such as authentication, access control, and encryption are considered. Methods of data protection against leaks and unauthorized access are being studied. They acquire skills in protecting data from unauthorized access, as well as developing secure information storage systems.	Fundamentals of algorithmization and programming, Introduction to information security	Identification and access management (IAM), Industrial practice 1
Practice-oriented module									
PD	UC	Software and mobile application security	180	6	4	LO7	Knowledge is being formed about the methods of ensuring the security of software and mobile applications. Typical vulnerabilities such as code vulnerabilities, authentication errors, and data leaks are considered. Security methods are being studied, including encryption, secure development and testing. The skills of analyzing application security and developing defensive mechanisms to prevent attacks are acquired.	Python programming language, Operating systems and OS security	WEB application security приложений
PD	UC	Artificial intelligence methods in information security	180	6	5	LO2, LO5, LO9	Knowledge about artificial intelligence (AI) methods and their application in information security is being formed. Technologies of machine learning, neural networks, and data analysis are being considered to identify anomalies and threats. AI algorithms are being studied for automating cyber defense processes. Skills in using AI to develop effective solutions for information security are being acquired.	Python programming language	Industrial practice 2/ Pre-graduation practice

PD	UC	Computer information protection technologies	180	6	3	LO3, LO6	Knowledge is being gained about computer information security technologies, such as encryption, authentication, access control, and network security management. Methods for preventing virus attacks, protecting against malware, and ensuring data confidentiality are being considered. Skills are being acquired for developing and implementing effective information security tools in computer systems and networks.	Introduction to information security	Intrusion prevention and detection systems
PD	UC	WEB application security приложений	180	6	5	LO7	Knowledge is being formed about the principles of web application security, including typical vulnerabilities such as SQL injection, XSS and CSRF. Methods of protection against attacks, data encryption, authentication and session management are considered. Skills are acquired in conducting security audits of web applications and implementing security mechanisms to prevent unauthorized access and data leaks.	Software and mobile application security	Industrial practice 2/ Pre-graduation practice
PD	UC	Identification and access management (IAM)	120	4	4	LO2, LO9	The key concepts of user identity management and access control to information systems, single sign-on systems, privilege management and security issues are considered. Skills are being developed to develop and implement IAM policies, including authentication, authorization, and user accounts. Technologies such as multi-factor authentication, privilege management, and single sign-on (SSO) systems are being studied.	Information Security Protocols, Databases and their security	Network security
PD	UC	Industrial practice 1	300	10	4	LO 1 – LO 12	The main objectives of the internship are: consolidating theoretical knowledge and practical skills in the chosen educational program in a working environment, gaining experience in organizational work, obtaining a working specialty, developing practical skills and competencies in the process of mastering a bachelor's program. It is carried out in the bases of practices at enterprises according to this educational program.	Python programming language, Introduction to cybersecurity, Databases and their security	Industrial practice 2/ Pre-graduation practice
PD	UC	Industrial practice 2/ Pre-graduation practice	300	10	6	LO 1 – LO 12	The purpose of the practice for bachelors is to ensure the relationship between the theoretical knowledge acquired during the acquisition of the chosen educational program and practical activities. The objectives of this practice are to consolidate and deepen the theoretical knowledge acquired by	Industrial practice 1, Intrusion prevention and detection systems, WEB application security	Final certification

							students in the course of training, collecting information for writing the final qualification work, the study of best practices in the enterprise, as well as gaining experience in independent research work, mastering a variety of methods of scientific work.	приложений	
TOTAL			**3750**	**125**					