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Chairman of the
Educational and Methodological
Council of JSC "International Information
Technology University"

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12 December 2024, Protocol of the EMC No. 3

APPROVED
Chairman of the Board – Rector
of JSC "International Information
Technology University"

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28 February 2025, Protocol of the AC No. 10

EDUCATIONAL PROGRAM

6B06301 Computer Security

Code and classification of the field of education: 6B06 Information and Communication technologies

Code and classification of training area: 6B063 Information Security

Group of educational programs: B058 IT Security

ISCED level: 6

NQR level: 6

ORC level: 6

Academic degree awarded: Bachelor's degree in Information and Communication Technologies under the educational program "6B06301 Computer Security"

Duration of study: 4

Number of credits: 240

AGREED
Chairman of the Association of Legal Entities
"Kazakhstan Association of
Information Security"
_____ Pokusov V.
"__" _____ 2025

AGREED
General Director of Limited Liability
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"National Innovation Center"
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Almaty, 2025

The code and name of the educational program: 6B06301 Computer Security

№	Educational program developers (Position, scientific degree, academic degree, Full name)	Signature
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List of abbreviations and acronyms

BD	Cycle of basic disciplines
BC	Basic competency
BM	Basic module
UC	University component
HE	Higher education
NMS	National Mandatory Standards of Higher and Post-Graduate Education
ATT	Additional types of training
EQF	European qualifications framework
EFE	European foundation for education
KSA	Knowledge, Skills and Abilities
FA	Final attestation
EC	Elective component
ISCED	International Standard Classification of Education
NQF	National qualifications framework
NQS	National qualifications system
GHM	General humanitarian module
RC	Required component
GEM	General education module
GED	Cycle of general education disciplines
EP	Educational program
GPM	General professional module
SQF	Sectoral qualifications framework
GEC	General education competency
MD	Cycle of major disciplines
PI	Professional internship
PS	Professional standard
PE	Postgraduate education
PC	Professional competency
PM	Professional module
LO	Learning outcome
QMS	Quality Management System

1. Description of the educational program

The program is designed to implement the principles of the democratic nature of education management, expanding the boundaries of academic freedom and the powers of educational institutions, which will ensure the training of elite, highly motivated personnel for innovative and knowledge-intensive sectors of the economy.

The educational program ensures the application of an individual approach to students, ensures the transformation of professional competencies from professional standards and qualification standards into learning outcomes. Student–centered learning is provided - the principle of education, which assumes a shift in emphasis in the educational process from teaching (as the main role of the teaching staff in the "translation" of knowledge) to teaching (as an active educational activity of the student).

The educational program "Computer Security" is to provide practice-oriented training for graduates in the field of creation, use and protection of information technologies designed to work in various industries and in business. This educational program is based on the recommendations of the Professional Standards of the Republic of Kazakhstan "Information Infrastructure and IT Security Professionals" (Appendix No. 11k to the order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" No. 222 dated 05.12.2022), follows new trends from the Atlas of New Professions, Regional standards, National Qualifications Framework and The industry qualifications framework according to level 6.

A computer security specialist is an employee engaged in ensuring computer security at an enterprise. The main activity of a computer security specialist is related to secure computer systems and means of processing, storing and transmitting information; information security services; mathematical models of processes occurring during information protection.

The educational program "Computer Security" was developed on the basis of an analysis of the labor functions of professional standards in the field of information security and information and communication technologies for the 6th level of qualification (bachelor, practical experience). The developed OP "Computer Security" meets the needs of stakeholders (students, employers, the state) and external qualification requirements.

2. Aim and objectives of the educational program

The purpose of the EP is to provide students with all the necessary knowledge and skills necessary to identify, investigate and evaluate security risks for operating systems, applications and programs; implementing security controls to mitigate these risks; training of specialists in the field of computer security required in the labor market; development of personal qualities necessary to achieve success in the field of computer security, such as determination, organization, diligence, communication skills, teamwork, responsibility, civic responsibility, tolerance.

Tasks of the EP:

1. To prepare graduates for professional activity in the field of protection of applications and programs from modifications.
2. To meet the needs of the market with computer security specialists.
3. Create conditions for continuous professional self-improvement.
4. Create conditions for the development of social and personal qualities of graduates (dedication, organization, hard work, sociability, ability to work in a team, responsibility for the final result of their professional activities, civic responsibility, tolerance), social mobility and competitiveness in the labor market.

3. Passport of the academic program

№	Name	Description
1.	Education area code and classification	6B06 Information and Communication Technologies
2.	Training direction code and classification	6B063 Information security
3.	Group of academic programs	B058 Information security
4.	Name of the educational program	6B06301 Computer security
5.	Aim of the educational program	The goal of the Educational Program "Computer Security" is to provide students with all the necessary knowledge and skills necessary to identify, investigate and evaluate security risks for operating systems, applications and programs; implementing security controls to mitigate these risks; training of specialists in the field of computer security required in the labor market; development of personal qualities necessary to achieve success in the field of computer security, such as determination, organization, diligence, communication skills, teamwork, responsibility, civic responsibility, tolerance.
6.	Type of the educational program	Current EP
7.	Level according to the National Classifications Framework	6
8.	Level according to the Sectoral Qualifications Framework	6
9.	Distinctive features of the program	6
10.	Partner University	-
11.	Academic degree awarded	Bachelor’s degree in Information and communication technologies in the educational program «6B06301 Computer security»
12.	Duration of study	4 years
13.	Volume of credits	240 ECTS credits
14.	Language of education	English
15.	Atlas of new professions	-
16.	Regional standard	
17.	Availability of an attachment to the training license	yes
18.	License number for the training area	KZ81LAM00001263
19.	Availability of program accreditation	ASIIN
20.	Generated learning outcomes	He is able to conduct interdisciplinary research and professional activities in the field of information security and telecommunications, knows modern methods of information security, programming, network and database administration. Demonstrates critical thinking skills, ethical and anti-corruption culture, is able to use cloud, intelligent and blockchain technologies, apply legislation and evaluate the effectiveness of projects.

4. Professional Standards (PS), profession cards, labor functions

№	Name of the PS	Profession card	Labor functions
1	Information infrastructure and IT security professionals	Service Security Specialist	Presentation of new information security-related functionality by a consultant and a customer
			Interaction with developers and service managers to eliminate discovered vulnerabilities
			Conducting seminars and participating in research work
		Information Security Specialist	Analysis and control of information security management and assurance activities
			Coordinating the organization's information security management and assurance processes
			Information security support
			Managing an organization's information security event
		Information Security Auditor	Completing the tasks of the audit assignment
			Planning the tasks of an audit assignment
			Ensuring the objectives of the audit assignment
2	Information security	Information Security Specialist	Planning of the organization's information security management processes
			Planning the organization's information security processes
			Planning of information security measures for the organization
			Control of the organization's information security management and assurance processes
			Providing information security for an organization
3	Ensuring the security of information infrastructure and IT	Security Specialist (ICT)	Administration of information security tools in computer systems and networks
		Information Security Specialist	Ensuring the protection of information in IP during their operation
			Implementation of information security systems in IP

5. List of the EP competencies

GEC1. The ability to understand the driving forces and patterns of the historical process, the place of man in the historical process and the ability to understand philosophy as a methodology of human activity, readiness for self-knowledge, self-activity, the development of cultural wealth as a factor in the harmonization of personal and interpersonal relations.

GEC2. The ability to form and develop skills and competencies in the field of organization, planning and management of production, the ability to apply the knowledge gained to understand the environmental reality, the ability to generalize, analyze, predict when setting goals in the professional field and choose ways to achieve them using scientific research methodology.

GEC3. The ability to conduct interdisciplinary scientific research using basic knowledge from the fields of economics and law, ecology and life safety. The ability to apply entrepreneurial qualities to the tasks of calculating the profitability of scientific projects. The ability to build personal and interpersonal relationships in compliance with an anti-corruption culture.

GEC4. The ability to write and communicate orally in the state language and the language of interethnic communication, the ability to use foreign sources of information, possess communication skills, public speaking, argumentation, discussion and polemics in a foreign language.

GEC5. The ability to be competent in choosing mathematical modeling methods for solving

specific engineering problems, the ability to be ready to identify the natural science essence of problems arising in the course of professional activity, and the ability to involve the appropriate mathematical apparatus for its solution.

BC6. The ability to use diagnostic and testing tools for equipment, to dismantle damaged hardware devices, to troubleshoot technological processes and technical systems.

BC7. The ability to use programming languages and tools for the development of secure software and mobile applications, to find coding errors in the information and computing system being developed, to create, test, debug and execute programs in different programming languages.

BC8. The ability to install and configure software and hardware for data collection, analyze the market of modern database management systems and databases, configure and protect databases.

BC9. The ability to record and analyze failures in the operation of server and network equipment, eliminate network vulnerabilities, administer servers.

BC10. The ability to set limits on the degree of resource use, work with remote users of the system, be competent in the organization of operating systems, the architecture of the principles of design, operation and administration of operating systems.

PC11. The ability to design technical specifications in accordance with the requirements of state, industry and corporate standards, comply with the norms of work completion time, prepare materials for presentation to the customer, use modern information and communication technologies in subject activities, master project management methods and implement them using modern information and communication technologies, use an information approach to quality assessment the functioning of information security systems.

PC12. The ability to configure systems and software on servers, optimize program code using specialized software tools, develop, maintain and test secure applications and programs, as well as protect them from modification.

PC13. The ability to master the methodology of developing measures to protect confidential information, apply technical means to ensure information security, the use of cryptanalysis.

PC14. The ability to audit the information security of an enterprise, apply international, national and corporate standards, identify possible ways of leaking confidential information, comply with the requirements of the information security instructions of the department, apply digital forensics methods to investigate computer incidents of the enterprise.

6. List of learning outcomes of the EP

LO1. Demonstrate the ability to conduct interdisciplinary scientific research using basic knowledge from the fields of economics and law, ecology and life safety. The ability to apply entrepreneurial qualities to the tasks of calculating the profitability of scientific projects. The ability to build personal and interpersonal relationships in compliance with the anti-corruption culture.

LO2. Demonstrate the ability to write and communicate orally in the state language and the language of interethnic communication, use foreign sources of information, possess communication skills, master office management techniques in the state language, have public speaking skills, argumentation, discussion and polemics in a professional foreign language.

LO3. Be able to use a variety of mathematical and natural science physics methods to solve specific engineering problems. Possess mathematical apparatus for the design of hardware components and electrical networks.

LO4. Demonstrate an understanding of history and philosophy as a methodology of human activity, readiness for self-knowledge, be able to apply methods of psychology, cultural studies and find organizational and managerial solutions in non-standard conditions and with the help of political science and sociology, systematize knowledge about world and Kazakh legislation in the field of information security.

LO5. Be able to use the principles of construction, types and functions of operating systems and apply existing methods of protection and security of operating systems. Be able to analyze operating systems and various applications for potential vulnerabilities and threats. Be able to implement various mechanisms to protect applications and scripts from modifications using programming and design methods.

LO6. Apply information security technologies, including various encryption, decryption and

cryptanalysis operations, which are based on mathematical research and information theory in the field of information security, as well as apply existing legislation in the field of information security.

LO7. Be able to program various applications using algorithmization methods, object-oriented programming, web technologies, is able to optimize program code using specialized corporate applications on the Django framework, develop, maintain and test secure applications and programs including mobile technologies and their security. The ability to use interdisciplinary tools for software development and testing.

LO8. Be able to set up computer networks, knows the routing and switching features of wired and wireless computer networks. Know the architecture features of computing systems and networks. Use DevNet tools related to network programming and scripting for network applications.

LO9. Apply the principles of organization, management and protection of databases. Apply data protection skills in corporate infrastructure and corporate cybersecurity and use applied AI tools. Apply data mining techniques. Be able to use methods for managing identification and access to applications.

LO10. Apply digital forensics techniques and have practical pentesting skills. Apply reverse engineering techniques to investigate malicious code. Demonstrate knowledge in modern information recovery technologies in case of failures and attacks.

LO11. Use cloud technology and intelligent cybersecurity techniques with machine learning. Use blockchain technologies to create secure applications. Apply deep learning tools to create intelligent applications. Be able to use Data Science methodologies to analyze big data. Also apply methods of countering cyber intelligence and is able to minimize the cyber risks of various applications.

LO12. Be able to apply the acquired knowledge according to the selected additional educational program.

7. Matrix for correlating the learning outcomes of the EP with the formed competencies (V)

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
GEC1				V								
GEC2	V	V										
GEC3	V											
GEC4		V										
GEC5			V									
BC6						V						
BC7						V		V		V		
BC8	V		V	V								V
BC9		V	V		V						V	
BC10			V	V							V	
PC11		V			V					V		
PC12	V							V		V		V
PC13	V		V	V	V						V	
PC14							V	V	V	V		

8. The relationship of LO with labor functions

№	LO	Labor functions
1.	LO1	Conducting seminars and participating in research work
2.	LO2	Presentation of new information security-related functionality by a consultant and a customer
3.	LO3	Interaction with developers and service managers to eliminate discovered vulnerabilities
4.	LO4	Managing an organization's information security event

5.	LO5	Analysis and control of information security management and assurance activities
6.	LO6	Information security support
7.	LO7	Information security support
8.	LO8	Information security support
9.	LO9	Planning the tasks of an audit assignment
10.	LO10	Ensuring the objectives of the audit assignment
11.	LO11	Completing the tasks of the audit assignment
12.	LO12	Coordinating the organization's information security management and assurance processes

9. Table showing interconnection of competencies, learning outcomes, assessment methods and criteria

Competencies of the EP graduate	Competences expressed in expected learning outcomes	Evaluation criteria	Name of the estimation method
General education competencies			
Demonstrate knowledge and understanding of the main methods of analyzing socially significant problems and processes, the main provisions and methods of the humanitarian, social, and economic sciences in various types of professional and social activities, as well as knowing the basic concepts of the theory of written and oral communication in the state language and the language of interethnic communication.	Being able to have excellent spoken and written communication in the state and official languages	Speaking and expressing one's own thoughts clearly	Creative task
		Answer questions correctly, fully, and convincingly	Creative task
		Maintain office work and document flow	Essay
	Demonstrate and apply humanitarian, socio-economic, and legal knowledge in an interdisciplinary context to solve professional problems.	Use the basics of philosophical knowledge to form a worldview argument	Creative task
		Have physical education skills	Fit test
		Knowing the basics of the legal system and legislation	Creative task
	To be proficient in the state language and one of the foreign languages at the level necessary for solving the problems of interpersonal and intercultural interaction and professional tasks.	To have oral communication skills	Creative task
		Knowing the state and foreign languages in written communication	Essay
		Know the methods of scientific research and academic writing	Creative task
To be able to develop arguments, to apply knowledge, and to solve problems	The ability for self-organization, self-education, and professional development	To strive for professional and personal growth	Creative task
		Public speaking	Presentation
		To be able to find compromises	Creative task
	Ability to critically reflect on past experience	To be able to develop arguments	Creative task
		To apply knowledge in practice and to solve problems	Creative task
	To apply basic knowledge to solve professional problems	To be able to negotiate	Creative task
		To strive for professional and personal growth	Creative task
		To offer new solutions	Creative task
Must be able to express their judgment and be able to interpret information to communicate their own understanding, skills, and activities to colleagues	To be competent in production and non-production costs	The ability to understand the presented task	Report
		Grasping the content	Report
	To be competent in ensuring conditions for safe living	Objective perception of the problem	Creative task
		Analysis of the initial situation	Creative task
Must have the ability to establish the most	Ability to work in a team	Maintaining partnerships	Project
		Conducting electronic communications	Report

trusting relationships with colleagues, to work in a team, and to communicate information, ideas, problems, and solutions	Tolerantly perceive social and cultural differences	Ability to work in a team	Project
		Capability of taking an active civic stance	Creative task
Must be able to independently study the materials necessary for continuing education in the specialty	The ability for self-organization and self-education	Possessing the skills of self-organization and self-education	Report
		Using the provisions and methods of self-organization and self-education in professional activities	Report
	Ability to use regulatory documents in their activities	Ability to read technical literature	Report
		To know international standards and recommendations	Presentation
Core competencies			
Possess modern trends and technologies in the field of computer security, be able to use ICT in professional activities	Willingness to take into account current trends in the development of information security and computer security technologies	Ability to analyze trends in cybersecurity	Report
		The ability to apply modern ICT to solve practical problems	Report
		Correct design and presentation of laboratory data	Report
	Knowledge of current trends in the development of technologies in the field of computer security and information technology, the ability to take them into account in professional activities	Understanding modern threats and information security tools	Creative task
		Knowledge of current trends in the development of ICT and cybersecurity	Creative task
		The ability to apply new technologies to enhance system security	Creative task
		Knowledge of terminology and analysis methods in the field of computer security	Report
	Knowledge of techniques for processing and presenting laboratory data in the field of computer security	Correct processing of experimental data on information system security	Report
		The ability to use visualization and presentation tools for results	Creative task
		Data presentation in accordance with scientific and professional standards	Report
Ability to collect, process, analyze and systematize scientific and technical information in the field of computer security; ability to use achievements of domestic and foreign science and technology; mastery of mathematical modeling methods to solve information and cybersecurity problems using standard application software packages	The ability to apply basic knowledge to solve professional problems in the field of computer security and protection of telecommunication systems and networks	The ability to use basic knowledge in the field of telecommunications and ICT to analyze vulnerabilities	Report
		Ability to apply security techniques in network infrastructures	Report
		Knowledge of the basics of cybersecurity for communication networks	Report
	Knowledge of the fundamental principles of functioning of telecommunication and computing systems, necessary for analyzing their vulnerabilities and ensuring security	The ability to correlate the technical characteristics of systems with potential threats and vulnerabilities	Creative task
		The ability to use technical fundamentals to build comprehensive protection	Creative task
			Report
	The ability to analyze and systematize scientific and technical information in the field of computer security and information technology	The ability to find and use relevant sources on cybersecurity	Report
		Ability to critically evaluate and structure scientific and technical information	Report
		The ability to systematize materials on threat research and protection methods	Creative task
			Report
Possess fundamental knowledge in mathematics, physics,	Be able to apply methods of differential and integral calculus to analyze	The correctness of solving problems in differential and integral calculus related to modeling processes in information security.	Control work

and information theory to solve computer security problems	information security processes	The ability to interpret mathematical results obtained	Creative task
		Application of mathematical analysis methods to solve applied problems in the field of information security using standard application software packages	Report
	Use linear algebra, probability theory, and statistics to model threats.	Ability to apply linear methods for threat analysis and modeling	Report
		The correctness of using probabilistic models and statistical methods in assessing risks and vulnerabilities	Creative task
		The ability to interpret the results of threat modeling and present them in a scientific and practical form	Report
	Apply the laws of physics and the fundamentals of information theory to analyze systems	Knowledge and correct use of physical laws	Report
		The ability to apply the basics of information theory	Creative task
		The ability to interpret analysis results in terms of reliability and information security of systems	Report
Possess modern programming and IT technologies for the development and maintenance of software and databases in the field of information security	Develop and debug programs in C++ and Java	Correctness of the construction of algorithms and syntax of programs	Report
		The ability to debug and test software.	Creative task
	Apply OOP, web technologies and frameworks for secure development	The ability to implement the basic principles of OOP	Report
		The correct use of web technologies and frameworks to protect applications	Report
	Project and administer databases, use Linux OS for security tasks	Ability to project database structures and ensure their integrity	Project
		Database administration and protection skills from unauthorized access	Report
		Knowledge of basic Linux commands and tools for information security tasks	Creative task
Master the principles of building and protecting computer networks, as well as the legal and organizational foundations of information security	Configure and protect wired and wireless networks (LAN, WLAN)	Ability to configure network equipment	Report
		The ability to apply network protection mechanisms	Report
		Skills to identify and eliminate network vulnerabilities	Report
	Apply methods of information recovery and digital forensics	Knowledge of information recovery tools in case of failures and attacks	Report
		Ability to analyze digital evidence and system logs	Report
		The correctness of documenting the results of digital forensics	Report
Professional competences			
Master the methods of ensuring and analyzing cybersecurity	Be able to identify and classify cyber attacks, apply incident investigation and digital forensics techniques	Knowledge of the types of cyber attacks and their signs	Report
		Correct application of investigative methods	Report
		The ability to analyze digital evidence	Report
	Possess practical skills of pentesting to assess the security of information systems	Ability to plan and perform penetration testing	Creative task
		The correctness of documenting the results of the pentest	Creative task
		The ability to propose measures to eliminate identified vulnerabilities	Creative task
	Apply cryptographic methods and information recovery technologies to protect data	Knowledge of cryptographic algorithms and their purpose	Report
		The ability to use information recovery tools	Creative task
		The correctness of the choice of protection methods depending on the task	Report

Possess modern technologies for the development and protection of software and information systems	Develop secure applications using OOP, Projecting patterns, and frameworks	Knowledge of OOP principles and Projecting patterns	Report
		Correctness of application development	Report
		Implementation of protection mechanisms in the application	Report
	Use DevSecOps approaches, as well as methods of reverse engineering and protection of applications from modification.	The ability to apply CI/CD tools with safety in mind	Creative task
		Mastery of reverse engineering techniques	Creative task
		The ability to protect applications from modification	Report
	To support corporate systems, taking into account the requirements of security and resistance to attacks	Ability to administer corporate applications	Report
		Application of monitoring and protection methods	Presentation
		Vulnerability assessment and implementation of resilience measures	Presentation
Possess infrastructure management tools and new information security technologies	Be able to configure and protect databases, operating systems, and networks, including the use of DevNet technologies	Ability to administer and protect OS and DBMS	Report
		Ownership of DevNet tools	Creative task
		Ability to identify and eliminate infrastructure vulnerabilities	Report
	Apply cloud technologies, blockchain, and identity and access management systems in information security tasks	Ownership of cloud services and blockchain technologies	Report
		The ability to apply authentication and authorization methods	Report
		The ability to choose the optimal means for specific security tasks	Report
	Use legal norms and management approaches to implement Projects in the field of information security	Knowledge of international and national information security standards	Creative task
		Ability to take legal risks into account in Projects	Report
		Application of Project management methods in the field of information security	Presentation
To possess the ability to self-organize, self-educate and establish the most trusting relationships with colleagues, to work in a team, communicate information, ideas, problems, and solutions	To possess professional skills for self-organization and self-education	Maintaining partnerships	Creative task
		To know problems and ways to solve them	Creative task
	To establish trusting relationships with colleagues, to work in a team	To work in a team	Project
		Tolerantly perceive social and cultural differences	Creative task
	To know the main directions, problems, and methods of self-organization and self-education	Maintaining partnerships	Creative task
		To improve qualifications	Report
		To solve professional problems	Creative task
Ability to independently study scientific and technical literature necessary to continue training in the specialty	Ability to use regulatory and technical documents in their professional activities.	To strive for professional and personal growth	Report
		Ability to use reference materials	Report
		Development of equipment operation methodology	Report
	To possess the skills to draw up technical reports on the results of the work performed	Ability to draw up reports, acts, etc.	Report
		To develop technical documents	Report
		To read scientific and technical literature	Report

10. Information about the modules of the educational program

Module code and name	Volume (labor intensity) of the module	Learning outcomes	Learning outcomes assessment criteria	Disciplines forming the module Code and name
GENERAL EDUCATION MODULES				
OOM6002 – Language and ICT skills development module	25	***As a result of studying this module, the student must:*** - know grammatical and lexical norms; apply them in oral and written speech to solve academic and everyday tasks; - develop listening, reading, speaking and writing skills; evaluate the correctness and relevance of speech utterances; - learn and use basic vocabulary and grammar on various topics; - read and interpret texts in English, apply the acquired vocabulary in oral and written speech; - participate in dialogues and discussions, develop oral and written communication skills within the studied topics; - know modern methods of information processing, storage, transmission and protection; - apply office software, online resources and digital technologies for educational and professional tasks; - analyze and evaluate the effectiveness of using ICT in professional activities.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	LAN6001KR - Kazakh (Russian) language LAN6001A - Foreign language ICT6001 - Information and Communication Technologies LAN6002A - Foreign language LAN6002KR - Kazakh (Russian) language
OOM6001 – Module of social and cultural development	18	***As a result of studying this module, the student must:*** - to know the basic sociological theories and paradigms; - to apply the methods of sociological research to the analysis of social processes; - analyze social phenomena and interpret social data in a scientific and applied context; - to know the basics of the political system, the typology of political regimes and their characteristics; - analyze domestic and foreign policy, processes of political competition and power in the modern world; - evaluate political ideas, values and the mechanisms of their influence on public policy; - to know the key stages and events of the modern history of Kazakhstan, to understand their importance for the formation of national identity; - analyze the processes of modernization of society in the context of the "Rukhani Zhangyru" program; - evaluate the role of historical heritage and traditions in strengthening identity and national consciousness;	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SPS6007 - Sociology-Political science HK6002 - History of Kazakhstan SPS6006 - Cultural studies-Psychology SPS6001 - Philosophy

		- analyze cultural processes, art styles, and cultural management strategies using case studies; - to know the basic concepts of psychology and their role in the educational and social sphere; - evaluate philosophical ideas and apply them to the analysis of modern social and cultural processes.		
OOM6003 – Module of physical culture	8	***As a result of studying this module, the student must:*** - know the basic principles of physical education, the basics of a healthy lifestyle and their importance for professional activity; - be able to perform control exercises and standards, apply physical exercises to maintain working capacity and health; - to develop self-control skills of physical condition, to form a stable motivation for regular physical education and sports.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	PhC6005 - Physical Culture PhC6006 - Physical Culture
OOM6004 – Module of personal and social development	5	***As a result of studying this module, the student must:*** - know the basics of creating and operating a business; be able to determine the forms of ownership, production, marketing and management processes; - apply the basic principles of finance and personnel management in the development of entrepreneurial projects; - understand the legal, economic and social foundations of anti-corruption; be able to identify and analyze conflicts of interest and violations of professional ethics; - apply research methods to analyze the anti-corruption activities of organizations; - know the basic economic principles and legal bases that influence decision-making; be able to draw up a personal and business budget, apply taxation and investment methods; - analyze economic behavior and assess financial risks; - know the principles of safe human interaction with the environment; - be able to apply protective measures in natural and man-made emergencies; analyze the consequences of negative factors and develop measures to prevent their impact; - to know the main environmental problems of our time and international approaches to their solution; - to be able to analyze the impact of production activities on the environment; - - to apply the concept of sustainable development in solving social and economic problems; - to know the philosophy, history and legal foundations of an inclusive approach in education; to be able to develop adapted educational programs and curricula for students with disabilities;	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	MGT6706 - Startups and entrepreneurship LAW6007 - Fundamentals of law and anti-corruption culture ECO6007 - Foundation of economics and financial literacy JUR6413 - Fundamentals safety of life activity JUR 6505 - Ecology and sustainable development HUM6400 - Inclusive education

		- to apply methods of psychological and pedagogical support in the educational process;		
BASIC MODULES				
BM6201 – Fundamental Technical Training Module	18	***As a result of studying this module, the student must:*** - know the basic concepts of differential and integral calculus; be able to apply analysis methods to solve applied problems in computer science; - interpret computational results in process modeling; - know the methods of linear algebra and analytical geometry; - be able to solve systems of linear equations, work with matrices and vectors; apply geometric methods to the analysis of technical and engineering problems; - know the laws of mechanics, molecular physics, thermodynamics, electricity and magnetism; - be able to solve physical problems using equations and laws; - apply experimental methods to verify physical patterns; - know the basic laws and methods of analyzing electrical circuits (Ohm, Kirchhoff, methods for circuits of the 1st and 2nd order); - be able to calculate the parameters of resistive and reactive circuits; - apply circuit analysis methods to solve engineering problems with direct current and alternating current sources.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	MAT6002 - Mathematical analysis MAT6001 - Algebra and Geometry PHY6001 - Физика EEC6001 - Basic Circuit Theory
BM6207 – Programming and Web Security Module	16	***As a result of studying this module, the student must:*** - know the basic structures of algorithms and methods of their construction; - - be able to develop, debug and implement programs in C++; - apply algorithmization methods to solve applied problems; -know the principles of object-oriented programming (encapsulation, inheritance, polymorphism); - be able to develop Java applications using classes and objects; - apply a design approach to implement software solutions; -know the basics of web development (HTML, CSS, JavaScript, PHP, MySQL); - be able to develop client-server web applications; - apply methods to protect and ensure the security of websites; - know modern web development and website administration technologies; - be able to create and maintain websites using CMS, UI/UX design, and teamwork tools; - analyze and optimize websites taking into account security, SEO, and fault tolerance requirements.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SFT6201 - Algorithmization and Programming SFT6207 - Object-oriented programming (Java) SFT6208 - Web technologies SFT6213 - Website development and maintenance
BM6206 – Practical and	6	***As a result of studying this module, the student must:***		EP6201 - Educational practice

Language Skills Module		- understand the basics of information security and the directions of its application; - be able to perform practical tasks on basic information security methods; - apply the acquired knowledge to solve professional problems in practice; - know professional vocabulary and grammatical structures on IT and computer security topics; - be able to read, interpret and use foreign sources of information; - develop oral and written communication skills in professional English.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	LAN6004PA - Professionally oriented foreign language
BM6205 – The Information Security Fundamentals Module	14	***As a result of studying this module, the student must:*** - know the basic sections of discrete mathematics, probability theory and mathematical statistics; - be able to apply mathematical apparatus to analyze cryptographic methods; - use statistical methods to assess the security of information processes; - know Kazakh and international laws and regulations in the field of information security; - be able to interpret legal norms for solving professional tasks; - apply legal mechanisms to ensure security policy in organizations; -know the basic concepts and methods of quantifying information, entropy and redundancy; - be able to apply coding methods to improve the reliability of data transmission; - analyze the effectiveness of information systems based on theoretical and practical aspects of information theory.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	MAT6018 - Mathematical foundations of information security SEC6217 - Legal Basics of Information Security EGR6202 - Information Theory
BM6205 – Networks and Operating Systems in Information Security Module	16	***As a result of studying this module, the student must:*** - know the principles of architecture, protocols, routing and switching in computer networks; - be able to design and configure local area networks; - apply methods to protect and optimize the performance of network systems; - know switching technologies and operating principles of routers; - be able to configure small and medium-sized business networks, including WLAN; - identify and prevent threats to the security of local networks; - know the structure and components of the Linux OS, including the kernel and file system; - be able to use Linux commands and tools for administration; - apply security techniques in the Linux environment.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	NET6201 - Computer Networking Basics NET6202 - Switching, Routing, and Wireless Essentials EGR6201 - Basics of the Linux operating system
BM6210 – Information Security and	12	***As a result of studying this module, the student must:*** - know the basics of data modeling and DBMS design; be able to implement data storage, extraction and protection;		SFT6211 - Organization of database management systems

Project Management Systems Module		- apply methods of backup, recovery and optimization of database performance; - know processor architecture, memory, and performance evaluation principles; - be able to analyze computing systems, including caching and pipelining; - apply knowledge to optimize computing processes and systems; - know the methods of project management and risk assessment; - be able to use tools at various stages of the project lifecycle; - determine the effectiveness of projects in the field of information security.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	HRD6201 - Organization and architecture of computing systems SEC6204 - Project Management in Information Security
BM6216 – Applied Artificial Intelligence (AI) Technologies in Information Security Module	4	***As a result of studying this module, the student must:*** - know the methods of data recovery and troubleshooting in storage systems; - be able to use specialized programs and utilities to restore information; - apply practical skills to analyze and solve problems in case of data loss or corruption; - know the basics of using artificial intelligence and machine learning in cybersecurity; - be able to use software agents and modeling methods to analyze cyber threats; - apply deep learning methods and non-classical logic to build intelligent protection systems.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SEC6243 - Information recovery technologies SEC6233 - Introduction to Intelligent Cybersecurity
BM6219 – Research and Scientific Preparation Module	3	***As a result of studying this module, the student must:*** - to know the basic principles and methods of scientific research; - to be able to collect, analyze and evaluate scientific information; - to apply the acquired knowledge in the implementation of educational and graduate projects; - to know modern methodological approaches to the organization of scientific work; - to be able to formulate goals, objectives and hypotheses of research; - to apply methods of analysis and interpretation of scientific data in the preparation of research projects.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	RM6201 - Fundamentals of scientific research RM6202 - Research metodology
PROFESSIONAL MODULE				
PM6206 – Protection and Investigation Technologies Module	22	***As a result of studying this module, the student must:*** - know the history and key processes of cybersecurity; - be able to classify the types of cyber attacks and determine their motives; apply basic analysis methods to work as a junior cybersecurity analyst; - know the basics of incident investigation and phishing response; - be able to recognize attack scenarios and collect incident data; - apply malware and unwanted program analysis methods; - know the basics of corporate security policy and monitoring methods;	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SEC6201 - Computer Information Protection Technologies SEC6221 - Introduction to Cybersecurity Incident Investigation SEC6212 - Corporate Cyber Security

		- be able to analyze host security and identify violations; - apply practical measures to respond to information security incidents in a corporate environment; - know the basic methods and rules for collecting digital evidence; - be able to use tools and frameworks for forensic analysis; - apply digital forensics to investigate computer crimes; - know the principles and stages of penetration testing; - be able to identify and exploit vulnerabilities in systems and networks; document the results of the pentest and propose measures to increase the level of security.		SEC6213 - Digital Forensics SEC6208 - Practical pentesting
PM6203 – Industrial and Pre-graduate Practice Module	13	***As a result of studying this module, the student must:*** - know the basics of information security technologies, including encryption and access control methods; - be able to apply data integrity tools in practical conditions; - analyze the effectiveness of information security methods used in organizations; - know modern methods of encryption, cryptanalysis and access control; - be able to use technologies to protect computer systems and networks in production environments; - assess risks and propose measures to ensure confidentiality, integrity and availability of data; - collect and systematize materials on the topic of the thesis project; - analyze and interpret the data obtained to form a theoretical and practical research base; - use the results of the analysis to prepare for writing and defending the thesis project.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	IP6202 - Industrial practice IP6203 - Industrial practice PP6204 - Pre-graduate practice
PM6209 – Information Protection and Cryptographic Security Module	18	***As a result of studying this module, the student must:*** - know the basic design patterns and their fields of application; - be able to use patterns to develop flexible and extensible systems; - apply theoretical knowledge in the implementation of practical projects; - know the basics of cryptology, cryptography and cryptanalysis; - be able to apply algorithms of symmetric and asymmetric cryptosystems, as well as electronic digital signature; - use cryptographic methods in the development and protection of information security systems; - know the principles of building and protecting operating systems; - be able to configure security settings, network services and access policies; - apply methods to identify and eliminate vulnerabilities in operating systems; - know the concepts of DBMS security and data protection methods; - be able to apply access control, backup and recovery mechanisms;	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SFT6212 - Design Pattern SEC6206 - Cryptographic methods of information security SEC6202 - Security of operating systems SEC6211 - Protection of database management systems

		- identify and prevent vulnerabilities, including SQL injections, in practical work with PostgreSQL.		
PM6215 – Infrastructure and Deep Security Technologies Module	8	***As a result of studying this module, the student must:*** - know the basics of cloud computing and the principles of existing cloud services; - be able to create and configure cloud services; - apply cloud computing technologies to solve cybersecurity problems; - know the principles of designing and programming mobile applications; - be able to develop user interfaces and connect telephony, Wi-Fi, Bluetooth and geolocation functions; - apply protection tools and methods to ensure the security of mobile applications; - know the methods of static and dynamic analysis of program code; - be able to restore algorithms and identify undocumented program features; - apply specialized tools for software analysis and reverse engineering; - know the approaches to integrating security principles into software development and operation processes; - be able to use CI/CD and automated security testing tools (Jenkins, GitLab CI/CD, SonarQube, OWASP ZAP); - apply DevSecOps methods to ensure safe and continuous software deployment; - know the basics of blockchain technology, consensus algorithms and the principles of cryptocurrencies; - be able to develop smart contracts and apply cryptographic protection methods; - analyze the possibilities of using blockchain technologies in various industries.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SEC6234 - Introduction to Cloud SEC6205 Mobile security technologies SEC6222 - Reverse Engineering SEC6223- DevSecOps SEC6238 - Blockchain technology
PM6212 – Application Development, Protection, and Access Control Module	11	***As a result of studying this module, the student must:*** - know modern access control methods and authentication protocols; - be able to apply role models and two-factor authentication mechanisms; - use identification and attribute management methods to protect information resources; - know the basics of designing corporate applications and web services; - be able to create and maintain corporate automation systems on Django; - use tools to develop online stores, startups and corporate portals; - know the principles of disassembly and debugging tools; - be able to protect applications and scripts from modifications and unauthorized copying;	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	SEC6244 - Identity and access management SFT6206 - Development of corporate applications on the Django framework SEC6236 - Protection of applications and scripts from modifications NET6207 - DevNet

		- apply methods of analysis and reconstruction of algorithms to increase software stability; - know the concepts of programmable networks (SDN) and automation approaches; - be able to use Python, Git, JSON, Postman and API for network programming; apply DevNet tools for scripting and managing application policies in network infrastructures.		
PM6201 – Minor Disciplines Module	15	***As a result of studying this module, the student must:*** - know the content of the selected disciplines of the additional educational program; - be able to apply the acquired knowledge and skills to expand professional competencies; - integrate additional competencies into future professional activities; - to know modern approaches and tools in the field of the chosen module; - to be able to use interdisciplinary knowledge to solve applied and research problems; - to form additional skills that promote professional mobility; - know the theoretical foundations and practical methods of the disciplines included in the supplementary program; - be able to adapt the acquired knowledge to professional conditions; - develop an individual educational trajectory and apply new competencies in real projects.	1. Oral exam 2. Test 3. Midterm exam 4. Computational and graphic work 5. Exam	MIN601 - Minor 1 MIN602 - Minor 2 MIN603 - Minor 3

11. Information about the disciplines of the educational program

	Discipline Code and Name	Brief description of the discipline (30-50 words)	Labor intensity of discipline in credits	Learning outcomes formed (codes)	Prerequisites	Postrequisites
Cycle of general education disciplines (GED) Required component (RC)						
1	LAN6001KR - Kazakh (Russian) language	The Kazakh/Russian Language course is aimed at improving language, speech, and communication skills. Its task is to improve the language abilities of students, develop skills and skills in four types of speech activity (speaking, listening, reading, writing). The content of the standard curriculum of the general education discipline "Kazakh/Russian language" includes topics of seminar (practical) classes and independent work of students. The training is conducted at 3 levels: A, B, C.	5	LO2	-	LAN6002KR - Kazakh (Russian) language
2	LAN6001A - Foreign language	An English language course offered to the 1st year students of IITU majoring in various specialties with a basic knowledge of general English. The course centers around general topics such as countries and nationalities; family and friends; daily routines; neighbourhood; shopping habits; travelling; sports and hobbies, etc. Each topic is studied through skills-oriented acquisition of the relevant glossary and target grammar structures in various kinds of listening, reading speaking and writing activities.	5	LO2	-	LAN6002A - Foreign language
3	ICT6001 - Information and Communication Technologies	Information and Communication Technologies is a course dedicated to studying modern methods and tools for processing, storing, transmitting, and protecting information. It covers the basics of working with digital technologies, internet resources, and software, as well as their application in professional and everyday activities.	5	LO8	-	NET6201 - Computer Networking Basics
4	LAN6002A - Foreign language	A course of General English is offered to the 1st year students of IITU. It focuses on such topics as Student's life, Daily routine, Education, jobs. Professional Skills, Work Experience, Kazakhstan on the global map, Holidays/ Traditions and Customs, etc. It is designed to deepen the students' understanding of their priorities and values, raise their language awareness, improve their speech skills and communication competences in General English. The language training is communicative, interactive, student-centered, outcome-oriented and heavily reliant on students' self-study work. The	5	LO2	LAN6001A - Foreign language	LAN6004PA - Professionally oriented foreign language

		latter is organized as TSIS (paragraph writing) and SIS (self-check Grammar, WB exercises, and project).				
5	LAN 6002KR - Kazakh (Russian) language	The course is based on a communicative-oriented concept, which includes elements of problem-based and communicative-individualized learning. The following three main linguo-methodological principles were chosen as the foundation: 1. The communicative focus of teaching, taking into account the relevant areas of speech communication; 2. The consideration of systematicity in the study of lexical units, their semantic interconnection, and their stylistic conditionality in various contexts and situations; 3. The formation of a system of language, speech, and communicative competencies that enable students to use the language effectively in diverse communicative situations. This approach allows students to develop not only theoretical knowledge but also practical skills necessary for effective language use in real-life situations.	5	LO2	LAN600 1KR - Kazakh (Russian) language	RW600 1 – Final state certific ation
6	SPS6007- Sociology- Political science	During the course "Sociology" various phenomena of social life are studied. At the same time the study is carried out from various paradigms of social knowledge, using theories and scientific methods. The course Political science provides comprehensive coverage of all key elements, the study of sources and political relations, types of political systems, democratic and authoritarian systems, political mechanisms, political competition and power, political capital and values, survival of political ideas, nationalism, analysis of domestic and foreign policy, political growth, state policy in the world political system.	4	LO4	-	SPS600 6- Cultura l studies- Psychol ogy
7	HK6002- History of Kazakhstan	This program is designed to form the historical consciousness of undergraduate students, based on the knowledge gained in the study of modern history of Kazakhstan. The versatility and importance of the discipline "Modern history of Kazakhstan" is due to its huge role in strengthening the identity of Kazakhstan, the identity of the people and the implementation of tasks related to the need for an intellectual breakthrough in the new Millennium. Kazakhstan's society must have a spiritual and ideological core for the	5	LO4	-	SPS600 6- Cultura l studies- Psychol ogy

		successful implementation of its goals, which is facilitated by the "Ruhani zagyru" program, which reveals the mechanisms for modernizing public consciousness and is based on the continuity of spiritual and cultural traditions. This program is designed to form the historical consciousness of undergraduate students, based on the knowledge gained in the study of modern history of Kazakhstan.				
8	SPS6006-Cultural studies-Psychology	As a result of studying a course in the field of cultural studies, students will acquire the fundamentals for studying the entire complex of social sciences and humanities, and master intercultural communication. At the same time, the discipline of cultural studies can serve as an addition to general courses in history and philosophy. The course material can serve as a methodological guide for a number of special disciplines: for example, ethics, history of culture, styles of art, national schools of management, strategy and negotiation tactics, management of culture. Methods and technologies of training used in the implementation of the program: role-playing games and educational discussions in various formats; case study, project method. The psychology course studies main issues of psychology in a wide educational and social context. Knowledge and skills gained in the course give students the opportunity to practically apply them in different life spheres such as personal, family, professional, business, social (working with people of different age and social categories).	4	LO4	HK6002-History of Kazakhstan	SPS6001 - Philosophy
9	SPS6001 - Philosophy	The object of study of the discipline is philosophy as a special form of spiritual studies in its cultural and historical development and modern sound. The main directions and problems of world and national philosophy are studied. Philosophy is a special form of cognition of the world, creating a system of cognition of the general principles and foundations of human life, about the essential characteristics of man's attitude to nature, society and spiritual life, in all its main direction.	5	LO4	SPS6006-Cultural studies-Psychology	RW6001 – Final state certification
10	PhC6005 - Physical Culture	The course provides a solution to the main tasks of physical education of students, provides for the delivery of control exercises and standards.	4	LO1	-	PhC6006 - Physical Culture
11	PhC6006 -	The course provides a solution to the main tasks of physical education of	4	LO1	PhC6005 -	RW6001 –

	Physical Culture	students, provides for the delivery of control exercises and standards.			Physical Culture	Final state certification
Cycle of general education disciplines (GED) University component (UC) and (or) Optional component (OC)						
Elective Discipline 1						
12	MGT6706 - Startups and entrepreneurship	This course provides an introduction to what a business is, how it works and how to run it. Students will define ownership and processes used in manufacturing and marketing, finance, personnel, and management in business operations.	5	LO1	-	RW6001 – Final state certification
13	LAW6007 - Fundamentals of law and anti-corruption culture	The course outlines the legal, economic, and social foundations of fighting corruption. Throughout the course, students will gain practical knowledge in identifying the peculiarities of state policies, applying international experiences in combating corruption, mastering skills in conflict resolution, and detecting corruption activities using professional ethics and methods. After successful completion of the course, students will gain the following competencies: 1. Understand the measures of legal responsibility for participation in corruption violations. 2. Determine the conflict of interests in the activities of organizations leading to corruption. 3. Analyze the work of organizations using various research methods.	5	LO1	-	RW6001 – Final state certification
14	ECO6007 - Foundation of economics and financial literacy	This course provides an integrated introduction to economics and legal foundations relevant to entrepreneurial decision-making and everyday personal finance. Students will understand basic economic principles, and navigate legal systems affecting individuals and businesses and learn how to manage personal finances. Topics include economic behavior, legal research, business budgeting, taxation, investment and case analysis. The course is open to non-economics majors interested in how economic, legal and financial systems shape our lives.	5	LO1	-	RW6001 – Final state certification
15	JUR6413 - Fundamentals safety of life activity	Studying ways of safe human interaction with the environment (industrial, domestic, urban, natural), sustainable operation of business facilities (organizations) in emergency situations, issues of protection from negative factors, prevention and elimination of the consequences of natural and man-made emergencies and the use of modern means defeat.	5	LO1	-	RW6001 – Final state certification
16	JUR 6505 - Ecology and	The course reveals the role of ecology in solving modern economic, social and political problems, as well as the	5	LO1	-	RW6001 – Final

	sustainable development	emergence of global environmental problems as a result of human production activities and the responsibility of the world community for them. A very important aspect is also international cooperation to ensure sustainable development. Various areas of practical application of ecology are also considered - natural resources and environmental pollution.				state certification
17	HUM6400 - Inclusive education	The philosophy, history and methodology of an inclusive approach. Documents governing the development of an inclusive process in higher professional education. Educational needs of students with disabilities and disabilities. Methods and forms of organization of the educational process at a university for students with disabilities. Development of adapted educational programs, curricula and educational paths for students with disabilities and disabilities. Psychological and pedagogical support of students with disabilities and disabilities at the university.	5	LO4	-	RW6001 – Final state certification
Cycle of core disciplines University component						
12	MAT6002 - Mathematical analysis	The purpose of the course is to familiarize students with important branches of calculus and its applications in computer science. During the educational process, students should familiarize themselves and be able to apply mathematical methods and tools to solve various applied problems. Moreover, they study fundamental methods of studying infinitesimal variables using analysis, which is based on the theory of differential and integral calculations.	6	LO3	-	MAT6001 - Algebra and Geometry
13	MAT6001 - Algebra and Geometry	The successful application of algebra and geometry to solve specific problems is primarily due to the rapid growth of computer technology. The course includes analytical geometry and linear algebra. Linear algebra is a branch of mathematics that studies matrices, vectors, vector spaces, linear transformations, and systems of linear equations. Analytical geometry is a section where the basic concepts are simple geometric shapes (points, lines, planes, curves, and second-order surfaces). The main means of research in analytical geometry are the method of coordinates and methods of elementary algebra.	4	LO3	MAT6002 - Mathematical analysis	HRD6201 - Organization and architecture of computing systems
14	PHY6001 - Physics	The study of the laws, principles, postulates and equations of mechanics, molecular physics and thermodynamics, electricity and magnetism, the use of the	4	LO3	MAT6002 - Mathema	EEC6001 - Basic

		equations of physics to solve specific physical problems, the use of physics methods for research, analysis and laboratory work in order to verify the operation and implementation of the laws of physics in nature and technology.			tical analysis	Circuit Theory
15	EEC6001 - Basic Circuit Theory	The course has been designed to introduce fundamental principles of circuit theory commonly used in engineering research and science applications. Techniques and principles of electrical circuit analysis including basic concepts such as voltage, current, resistance, impedance, Ohm"s and Kirchoff"s law; basic electric circuit analysis techniques, resistive circuits, 1st order and 2nd order circuits; circuits with DC and AC sources.	4	LO3	PHY6001 - Physics	NET6201 - Computer Networking Basics
16	SFT6201 - Algorithmization and Programming	The course is designed to study algorithms and development programs for solving various problems. For this, the program structure, principles of constructing algorithms and programs, methods of solution, algorithmization, programming, debugging and implementation of programs using the C ++ language are considered.	6	LO3	ICT6001 - Information and Communication Technologies	SFT6207 - Object-oriented programming (Java)
17	SFT6207 - Object-oriented programming (Java)	The course is designed to study the basics of programming methodology using objects and classes, the principles of object-oriented programming in the Java environment. The course takes a project-based approach to implement Java applications.	4	LO7	SFT6201 - Algorithmization and Programming	SFT6208 - Web technologies
18	EP6201 - Educational practice	The course is designed to learn the basics of information security	2	LO5, LO6	ICT6001 - Information and Communication Technologies	IP6202 – Industrial practice
19	LAN6004PA - Professionally oriented foreign language	A course of Professional English focuses on such topics of professional interest as Future trends in IT, Computer as a friend, Computer as a foe, Minimizing the negative impacts, Magnetic storage, Optical storage, Flash memory, the Programming languages, Web design, Graphics and design, etc. It is designed to raise the students' language awareness, improve their speech skills and communication competences in Professional English.	4	LO2	LAN6001A - Foreign language	SEC6204 – Project Management in Information Security
20	MAT6018 - Mathematical foundations of information security	The course is designed to study the sections of discrete mathematics, as well as the theory of probability and mathematical statistics, necessary for studying the process of ensuring information security.	6	LO3, LO6	MAT6002 - Mathematical analysis	SEC6206 – Cryptographic methods of informa

						tion security
21	SEC6217 - Legal Basics of Information Security	A course to study thepolitics and information security on a global scale. Study of Kazakhstani and international laws and regulations in the field of information security.	4	LO4, LO6	LAW6007 – Fundamentals of law and anti-corruption culture	SEC6212 – Corporate Cyber Security
22	EGR6202 - Information Theory	The course is aimed at studying error-correcting codes, taking into account the information redundancy limit, the quantitative determination of information. The aim of the course is to form a system of knowledge on the basics of information theory and its application in practice of modern information systems. Course objectives: the concept and types of information systems, the concept of entropy and how to evaluate it, the concept of information, methods of quantitative assessment of information, theoretical and practical aspects of effective coding, theoretical and practical aspects of noiseless coding, data transmission systems, modulation and demodulation	4	LO6	MAT6002 - Mathematical analysis	NET6201 - Computer Networking Basics
23	NET6201 - Computer Networking Basics	This course is aimed at studying the principles of design, construction, operation of computer networks. A wide range of topics are covered throughout the course, including network architecture, protocols, routing, switching, security, and performance. The purpose of the discipline is to introduce fundamental networking concepts and technologies, as well as to help develop the skills necessary to plan and implement computer networks in various applications.	6	LO8	EGR6202 - Information Theory	NET6202 - Switching, Routing, and Wireless Essentials
24	NET6202 - Switching, Routing, and Wireless Essentials	The course is devoted to switching technologies and the operation of routers for small and medium-sized businesses. The course also includes topics such as wireless LANs and security concepts. Students will be able to perform basic network settings and troubleshoot, identify and prevent local network security threats, and configure and protect the core WLAN.	6	LO8	NET6201 - Computer Networking Basics	NET6207 – DevNet
25	EGR6201 - Basics of the Linux operating system	This course focuses on learning about the versatile Linux operating system that can be used for a variety of purposes, including servers, desktops, and embedded systems. The aim of this discipline is to teach students the basics of the Linux operating system, which covers a wide range of topics, including the Linux kernel, the Linux file system, commands, networking, and Linux security.	4	LO5	SFT6201 - Algorithmization and Programming	SEC6202 - Security of operating systems

26	SFT6211 - Organization of database management systems	The course is aimed at studying the design and implementation of database management systems. A wide range of topics are covered throughout the course, including data modeling, data storage and retrieval, concurrency control, data integrity and security, backup and recovery, and performance optimization. The goal of the discipline is to equip students with the knowledge and skills necessary to design and implement database management systems that are essential for the success of modern organizations.	4	LO9	SFT6208 - Web technologies	SEC6211 - Protection of database management systems x
27	HRD6201 - Organization and architecture of computing systems	The course introduces the basic structure of modern programmable computer, including the main laws underlying evaluation of hardware's performance. It covers the fundamentals of classical and modern processor design: performance and cost issues, instruction sets, pipelining, caches, physical memory, virtual memory, I/O superscalar and an introduction to shared memory multiprocessors.	4	LO8	EEC6001 - Basic Circuit Theory	SEC6222 - Reverse Engineering
28	SEC6204 - Project Management in Information Security	To be able to use project management tools at various stages of the project life cycle, to make a qualitative and quantitative assessment of project risks, to determine the effectiveness of the project	4	LO4	SEC6217 – Legal Basics of Information Security	SEC6223 – DevSecOps
Cycle of core disciplines Optional component						
Elective Discipline 2						
29	SFT6208 - Web technologies	This course teaches the basics of website development using HTML, Cascading Style Sheets (CSS), JavaScript, and JQuery. Teaches you how to use the PHP programming language, master MySQL database basics, and develop secure server-side client web applications.	4	LO7	SFT6201 - Algorithmization and Programming	SFT6213 - Website development and maintenance
30	SFT6213 - Website development and maintenance	The course focuses on developing students' theoretical knowledge and practical skills in website creation and maintenance. It covers modern web development technologies: HTML, CSS, JavaScript, PHP, databases, CMS, as well as UI/UX design principles and responsive layout. Students explore frameworks (Bootstrap, jQuery), collaboration tools (Git, Figma), debugging, and testing. Special attention is given to site administration, security, SEO, analytics, and fault tolerance. The practical part includes full-cycle projects—from technical specification to deployment and maintenance—enabling students to gain in-demand competencies in the field of web technologies.	4	LO7	SFT6208 - Web technologies	SFT6211 - Organization of database management systems

Elective Discipline 3						
31	SEC6243 - Information recovery technologies	The course is designed to teach students the basics of data recovery, which can be useful in the event of its loss, damage or destruction. As part of the course, students learn how to use special tools for data recovery, including data recovery programs and utilities for detecting and eliminating errors in storage systems.	4	LO10	SEC6201 – Computer Information Protection Technologies	SEC6213 – Digital Forensics
32	SEC6233 - Introduction to Intelligent Cybersecurity	The course contains lecture and laboratory material on knowledge management for cybersecurity purposes and on the use of software agents and other tools and systems for deep modeling of the environment and the agent itself, followed by machine learning, in particular deep learning and reinforcement learning and the practical application of predicate and non-classical logics to build reasoning machines.	4	LO11	MAT6018 – Mathematical foundations of information security	SEC6238 - Blockchain technology
Elective Discipline 4						
33	RM6201 - Fundamentals of scientific research	The course is devoted to the study of activities aimed at developing students' ability to independent theoretical and practical judgments and conclusions, the ability to objectively assess scientific information, freedom of scientific research and the desire to apply scientific knowledge in educational activities, including for the implementation of the diploma project (work).	3	LO1	MAT6002 - Mathematical analysis	RM6202 - Research metodology
34	RM6202 - Research metodology	The course is devoted to the study of activities aimed at developing students ' ability to independent theoretical and practical judgments and conclusions, skills of objective evaluation of scientific information, freedom of scientific research and the desire to apply scientific knowledge in educational activities, including for the diploma project (work).	3	LO1	MAT6002 - Mathematical analysis	RM6202 - Research metodology
Cycle of majors University component						
35	SEC6201 - Computer Information Protection Technologies	This course provides the basic knowledge necessary to understand the basics of cybersecurity. During the course, students learn the history of cybersecurity, the types and motives of cyberattacks, the key roles of cybersecurity in an organization, key cybersecurity processes, and an example of each process. As a result of the course, students acquire the skills to work as a junior cybersecurity analyst.	4	LO6	EGR6202 - Information Theory	SEC6221 – Introduction to Cybersecurity Incident Investigation
36	SEC6221 - Introduction to Cybersecurity	The course program provides theoretical and practical skills in recognizing possible attack scenarios in a harmless host incident and collecting	4	LO6	SEC6201 – Computer	SEC6213 – Digital

	Incident Investigation	data on IT security incidents. The course covers such topics as: Malware, Potentially unwanted programs and files, Investigation basics, Phishing response			Information Protection Technologies	Forensics
37	SEC6212 - Corporate Cyber Security	The course is devoted to the study of corporate security issues, analysis of host security, monitoring, application of methods for detecting information security breaches and responding to them	4	LO9	NET6201 - Computer Networking Basics	SEC6208 – Practical pentesting
38	SEC6213 - Digital Forensics	This course teaches you to use special techniques, methods and tools of digital forensics. The course is designed to study the methods of disclosing and investigating computer crimes, the rules for collecting, securing and presenting evidence on them. The course reviews the popular tools for conducting forensic analysis and collecting digital evidence. The course reviews the utilities, frameworks and tools for forensic analysis.	4	LO10	SEC6221 – Introduction to Cybersecurity Incident Investigation	SEC6222 - Reverse Engineering
39	SEC6208 - Practical pentesting	The course aims to teach students the skills necessary to perform penetration testing, which is a type of security assessment that simulates an attack on a computer system or network. The goal of the discipline is to identify and exploit security vulnerabilities to improve the security of a system or network, including gathering information about the target system or network, elevating privileges to gain access to more important parts of the target system or network, and documenting penetration test results.	6	LO10	SEC6212 – Corporate Cyber Security	SEC6222 - Reverse Engineering
40	IP6202 - Industrial practice	The course is dedicated to the study of information security technologies, including methods of encryption, access control and data integrity.	4	LO6	EP6201 - Educational practice	PP6204 - Pre-graduate practice
41	IP6203 - Industrial practice	The course is dedicated to the study of information security technologies and covers issues of confidentiality, integrity and availability of data. Students learn about modern methods of encryption, cryptanalysis, access control, as well as technologies for protecting computer systems and networks.	4	LO6, LO9	IP6202 – Industrial practice	PP6204 – Pre-graduate practice
42	PP6204 - Pre-graduate practice	Collect and systematize materials related to the topic of the thesis Project; analyze the data obtained to form the theoretical and practical basis of the research.	5	LO1	IP6203 – Industrial practice	RW6001 – Final state certification
43	SFT6212 - Design Pattern	Design Pattern course is designed for students who seek to deepen their knowledge of software design and acquire skills in developing flexible,	6	LO7	SFT6207 - Object-oriented program	RW6001 – Final state

		maintainable, and extensible systems. The course covers both theoretical and practical aspects of the application of design patterns, providing students with the necessary knowledge and skills to successfully work in the field of software development.			ming (Java)	certification
44	SEC6206 - Cryptographic methods of information security	The course provides knowledge of the principles of cryptology, cryptography, cryptanalysis. mathematical foundations of algorithms for asymmetric and symmetric cryptosystems, electronic digital signature. To be able to apply cryptography in the development of information security systems in practice.	5	LO6	MAT6018 – Mathematical foundations of information security	SEC6238 - Blockchain technology
45	SEC6202 - Security of operating systems	The course is devoted to the study of security configurations, network settings, local and group security policies of operating systems. The course entry discusses in detail the principles of construction, types and functions of operating systems and their protection system.	4	LO5	EGR6201 - Basics of the Linux operating system	SEC6236 – Protection of applications and scripts from modifications
46	SEC6211 - Protection of database management systems	The course represents an overview of different concepts and techniques to provide Database Management System Security. Topics cover advanced SQL, Transaction Control Language, Data Control Language, functions and triggers, controlling and monitoring of a database, backing up and restoring databases, SQL – injections and etc. During the course students will implement different issues using PostgreSQL DBMS.	5	LO9	SFT6211 - Organization of database management systems	SEC6244 – Identity and access management
47	MIN601 - Minor 1	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies	5	LO12	-	MIN602 – Minor 2
48	MIN602 - Minor 2	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies	5	LO12	MIN601 – Minor 1	MIN603 – Minor 3
49	MIN603 - Minor 3	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies	5	LO12	MIN602 – Minor 2	RW6001 – Final state certification
Cycle of majors Optional component						
Elective Discipline 5						
50	SEC6234 - Introduction to Cloud	The course is aimed at studying the technology of creating a cloud service, working with existing cloud services,	4	LO11	NET6201 - Compute	RW6001 – Final

		using cloud computing technology in solving cybersecurity problems.			r Networking Basics	state certification
51	SEC6205 - Mobile security technologies	The discipline provides knowledge on the use of tools for programming and design of mobile applications, on the development of user interfaces for mobile applications, on the use of software functions that support telephony, sending / receiving SMS, managing connections via Wi-Fi, Bluetooth, programming background services, notification mechanisms, etc. alarms, application interaction with geolocation and map services	4	LO7, LO11	SFT6207 - Object-oriented programming (Java)	RW6001 – Final state certification
Elective Discipline 6						
52	SEC6222 - Reverse Engineering	This course is devoted to the study of the process of analysis (disassembly) of the machine code of the program, the restoration of the algorithm, the detection of undocumented program features using the methods of static or dynamic code analysis. During the course, both methods and special programs for restoring the source code are used	4	LO5, LO6	SEC6202 - Security of operating systems	RW6001 – Final state certification
53	SEC6223- DevSecOps	This discipline focuses on integrating security principles (Security) into the processes of software development (Development) and operations (Operations). Students study methods, approaches, and tools that ensure continuous and secure deployment of software products. Practical sessions focus on applying tools such as Jenkins, GitLab CI/CD, SonarQube, OWASP ZAP, and others, as well as configuring security policies to protect data and systems. The course aims to equip students with skills to work in modern IT teams, emphasizing the prevention and minimization of cybersecurity risks.	4	LO5, LO6	SEC6204 - Project Management in Information Security	RW6001 – Final state certification
54	SEC6238 - Blockchain technology	The course is dedicated to learning the basics of blockchain technology. The course examines the practice of applying blockchain technologies in bitcoin and ethereum cryptocurrencies, as well as other industries. The discipline is based on cryptographic knowledge and includes materials on the development of smart contracts, various consensus algorithms, etc.	4	LO5, LO6	SEC6206 – Cryptographic methods of information security	RW6001 – Final state certification
Elective Discipline 7						
55	SEC6244 - Identity and access management	The course includes the study of methods and technologies for managing access to the organization's information resources. As part of the course, students learn to apply modern identity and access management techniques and technologies, including authentication protocols, role-based access models,	6	LO9	SEC6211 - Protection of database management systemsx	RW6001 – Final state certification

		two-factor authentication, and attribute management.				
56	SFT6206 - Development of corporate applications on the Django framework	This course allows you to create business automation systems, Internet projects, services, and startups. Creating large online stores or corporate portals with the introduction of user interaction services and business automation elements.	6	LO7	SFT6208 - Web technologies	RW6001 – Final state certification
Elective Discipline 8						
57	SEC6236 - Protection of applications and scripts from modifications	This course is intended to study the issues of choosing and using disassembly tools, debugging and protecting applications, internal devices and algorithms of the basic disassembly and debugging tools. The course aims to develop skills in working with tools and tools for studying and protecting applications from modification. We study various approaches to the study and debugging of applications, reconstruction of algorithms, practical methods of working with popular disassembly tools. The knowledge gained during the study of this course will effectively protect programs from modification and unauthorized copying, as well as create more application optimization.	5	LO5	SEC6202 - Security of operating systems	RW6001 – Final state certification
58	NET6207 - DevNet	The course is aimed at understanding the meaning, settings and the use of concepts software, as well as related tools with network programming (creation scripts in Python, Git, JSON, Postman, API). Description of your own approach to a software-defined network (SDN), including centralized managing application policies.	5	LO8	NET6202 - Switching, Routing, and Wireless Essentials	RW6001 – Final state certification
Final State Examination						
59	RW6001	Writing and defending a diploma thesis, diploma project or preparation and passing of a comprehensive exam.	8			

12. Curriculum of the educational program (Platonus)

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period							
												Classroom work					Independent work of students		1 course		2 course		3 course		4 course	
								Exams	Differentiated	Term	Total	Lectures	Laboratory trainings	Practice	Studio	Practice	Independent work of	Independent work of	1	2	3	4	5	6	7	8
																			Number of weeks in the academic period							
																			15	15	15	15	15	15	15	15
Minor module for disciplines																										
General modules																										
1	OOM6002 – Language and ICT skills development module	GER	CS	LAN6001KR	Kazakh (Russian) language	5	1	1			5/150			45			15	90	5.0							
2		GER	CS	LAN6001A	Foreign language	5	1	1			5/150			45			15	90	5.0							
3		GER	CS	ICT6001	Information and Communication Technologies	5	2	2			5/150	15	30.0				15	90		5.0						
4		GER	CS	LAN6002A	Foreign language	5	2	2			5/150			45			15	90		5.0						
5		GER	CS	LAN6002KR	Kazakh (Russian) language	5	2	2			5/150			45			15	90		5.0						
6	OOM6001 – Module of social and cultural development	GER	CS	SPS6007	Sociology-Political science	4	1	1			4/120	15		30			15	60	4.0							
7		GER	CS	HK6002	History of Kazakhstan	5	1	1			5/150	15		30			15	90	5.0							
8		GER	CS	SPS6006	Cultural studies-Psychology	4	2	2			4/120	15		30			15	60		4.0						
9		GER	CS	SPS6001	Philosophy	5	5	5			5/150	15		30			15	90					5.0			

10	OOM6003 – Module of physical culture	GE R	CS	PhC6005	Physical Culture	4	2	2			4/120			45			15	60		4.0						
11		GE R	CS	PhC6006	Physical Culture	4	3	3			4/120			45			15	60			4.0					
12	OOM6004 – Module of personal and social development	GE R	ES	MGT6706	Startups and entrepreneurship	5	8	8			5/150	15		30			15	90								5.0
13		GE R		LAW6007	Fundamentals of law and anti-corruption culture			8			5/150	15		30			15	90								
14		GE R		ECO6007	Foundation of economics and financial literacy			8			5/150	15		30			15	90								
15		GE R		JUR6413	Fundamentals safety of life activity			8			5/150	15		30			15	90								
16		GE R		JUR 6505	Ecology and sustainable development			8			5/150	15		30			15	90								
17		GE R		HUM6400	Inclusive education			8			5/150	15		30			15	90								
Modules of specialty/education programm																									
18	BM6201 – Fundamental Technical Training Module	BS	UC	MAT6002	Mathematical analysis	6	1	1			6/180	30		30			15	105	6.0							
19		BS	UC	MAT6001	Algebra and Geometry	4	2	2			4/120	15		30			15	60		4.0						
20		BS	UC	PHY6001	Physics	4	3	3			4/120	15	30.0				15	60			4.0					
21		BS	UC	EEC6001	Basic Circuit Theory	4	4	4			4/120	15	30.0				15	60				4.0				
22	BM6207 – Programming and Web Security Module	BS	UC	SFT6201	Algorithmization and Programming	6	2	2			6/180	15	30.0	15			15	105		6.0						
23		BS	UC	SFT6207	Object-oriented programming (Java)	6	3	3			6/180	15	30.0	15			15	105			6.0					

24		BS	ES	SFT6208	Web technologies	4	4	4			4/120	15	15.0	15			15	60				4.0				
25		BS		SFT6213	Website development and maintenance			4			4/120	15	15.0	15			15	60								
26	BM6206 – Practical and Language Skills Module	**BS**	**UC**	**EP6201**	**Educational practice**	**2**	**2**				**2/60**					60				2.0						
27		BS	UC	LAN6004PA	Professionally oriented foreign language	4	4	4			4/120			45			15	60				4.0				
28	BM6205 – The Information Security Fundamentals Module	BS	UC	MAT6018	Mathematical foundations of information security	6	3	3			6/180	30		30			15	105			6.0					
29		BS	UC	SEC6217	Legal Basics of Information Security	4	3	3			4/120	15		30			15	60			4.0					
30		BS	UC	EGR6202	Information Theory	4	5	5			4/120	15	30.0				15	60					4.0			
31	BM6205 – Networks and Operating Systems in Information Security Module	BS	UC	NET6201	Computer Networking Basics	6	3	3			6/180	15	30.0	15			15	105			6.0					
32		BS	UC	NET6202	Switching, Routing, and Wireless Essentials	6	4	4			6/180	15	30.0	15			15	105				6.0				
33		BS	UC	EGR6201	Basics of the Linux operating system	4	4	4			4/120	15	15.0	15			15	60				4.0				
34	BM6210 – Information Security and Project Management Systems Module	BS	UC	SFT6211	Organization of database management systems	4	5	5			4/120	15	15.0	15			15	60					4.0			
35		BS	UC	HRD6201	Organization and architecture of	4	5	5			4/120	15	15.0	15			15	60					4.0			

					computing systems																				
36		BS	UC	SEC6204	Project Management in Information Security	4	6	6			4/120	15	30.0				15	60						4.0		
37	BM6216 – Applied Artificial Intelligence (AI) Technologies in Information Security Module	BS	ES	SEC6243	Information recovery technologies	4	6	6			4/120	15	15.0	15			15	60						4.0		
38		BS		SEC6233	Introduction to Intelligent Cybersecurity			6			4/120	15	15.0	15			15	60								
39	BM6219 – Research and Scientific Preparation Module	BS	ES	RM6201	Fundamentals of scientific research	3	8	8			3/90	15		15			15	45								3.0
40		BS		RM6202	Research metodology			8			3/90	15		15			15	45								
41	PM6206 – Protection and Investigation Technologies Module	AS	UC	SEC6201	Computer Information Protection Technologies	4	4	4			4/120	15	15.0	15			15	60				4.0				
42		AS	UC	SEC6221	Introduction to Cybersecurity Incident Investigation	4	5	5			4/120	15	30.0				15	60					4.0			
43		AS	UC	SEC6212	Corporate Cyber Security	4	6	6			4/120	15	15.0	15			15	60						4.0		
44		AS	UC	SEC6213	Digital Forensics	4	7	7			4/120	15	15.0	15			15	60							4.0	
45		AS	UC	SEC6208	Practical pentesting	6	7	7			6/180	15	30.0	15			15	105							6.0	
46	PM6203 – Industrial	**AS**	**UC**	**IP6202**	**Industrial practice**	**4**	**4**				**4/120**					120						4.0				

47	and Pre-graduate Practice Module	**AS**	**UC**	**IP6203**	**Industrial practice**	**4**	**6**				**4/120**					120								4.0		
48		**AS**	**UC**	**PP6204**	**Pre-graduate practice**	**5**	**8**				**5/150**					150										5.0
49	PM6209 – Information Protection and Cryptographic Security Module	AS	UC	SFT6212	Design Pattern	4	5	5			4/120	15	30.0				15	60					4.0			
50		AS	UC	SEC6206	Cryptographic methods of information security	5	6	6			5/150	15	15.0	15			15	90						5.0		
51		AS	UC	SEC6202	Security of operating systems	4	6	6			4/120	15	30.0				15	60						4.0		
52		AS	UC	SEC6211	Protection of database management systems	5	7	7			5/150	15	15.0	15			15	90							5.0	
53	PM6215 – Infrastructure and Deep Security Technologies Module	AS	ES	SEC6234	Introduction to Cloud	4	7	7			4/120	15	15.0	15			15	60							4.0	
54		AS		SEC6205	Mobile security technologies			7			4/120	15	15.0	15			15	60								
55		AS	ES	SEC6222	Reverse Engineering	4	8	8			4/120	15	30.0				15	60								4.0
56		AS		SEC6223	DevSecOps			8			4/120	15	30.0				15	60								
57		AS		SEC6238	Blockchain technology			8			4/120	15	30.0				15	60								
58	PM6212 – Application Development, Protection, and Access Control Module	AS	ES	SEC6244	Identity and access management	6	7	7			6/180	15	30.0	15			15	105							6.0	
59		AS		SFT6206	Development of corporate applications on the Django framework			7			6/180	15	30.0	15			15	105								
60		AS	ES	SEC6236	Protection of applications and scripts	5	8	8			5/150	15	30.0				15	90								5.0

					from modifications																				
61		AS		NET6207	DevNet			8			5/150	15	30.0				15	90							
Additional modules beyond qualification																									
Modules of choice																									
62	PM6201 – Minor Disciplines Module	AS	ES	MIN601	Minor 1	5	5	5			5/150	15	30.0				15	90					5.0		
63		AS	ES	MIN602	Minor 2	5	6	6			5/150	15	30.0				15	90						5.0	
64		AS	ES	MIN603	Minor 3	5	7	7			5/150	15	30.0				15	90							5.0
Weekly average workload at hours																			0	0	0	0	0	0	0	0
1	**General education subjects(GER)**					**56**		**12**	**0**	**0**	**1530**	**75**	**30**	**390**	**0**	**0**	**165**	**870**	**19**	**23**	**4**	**0**	**5**	**0**	**0**	**5**
	Core subjects(GER/CS)					51		11	0	0	1530	75	30	390	0	0	165	870	19	23	4	0	5	0	0	0
	University component(GER/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(GER/ES)					5		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2	**Base requirements(BS)**					**89**		**19**	**0**	**0**	**2340**	**255**	**285**	**270**	**0**	**60**	**240**	**1230**	**6**	**12**	**26**	**22**	**12**	**8**	**0**	**3**
	Core subjects(BS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BS/UC)					78		16	0	0	2340	255	285	270	0	60	240	1230	6	12	26	18	12	4	0	0
	Electives(BS/ES)					11		3	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	3
3	**Profession requirements(VRS)**					**87**		**16**	**0**	**0**	**2040**	**180**	**285**	**90**	**0**	**390**	**180**	**915**	**0**	**0**	**0**	**8**	**13**	**22**	**30**	**14**
	Core subjects(VRS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(VRS/UC)					53		9	0	0	1590	135	195	90	0	390	135	645	0	0	0	8	8	17	15	5
	Electives(VRS/ES)					34		7	0	0	450	45	90	0	0	0	45	270	0	0	0	0	5	5	15	9
4	**Disciplines for the formation of professional competencies(BDFPC)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDFPC/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDFPC/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDFPC/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDPD/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDPD/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDPD/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total on curriculum		232			**0**	**0**	**5910**	**510**	**600**	**750**	**0**	**450**	**585**	3015	**25**	**35**	**30**	**30**	**30**	**30**	**30**	**22**
6	**Additional courses**										**Number of credits**			**Academic period**			**Number of hours**			**Number of weeks**		
7	**Module of final certification (MoFC)**										**8**						**240.0**					
Total including FC											**240**						**7200.0**					

13. Additional Educational Programs (Minor)