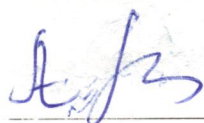


AGREED

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



Mustafina A.

«12» December 2024 Protocol of the EMC № 3

APPROVED

Chairman of the Board-Rector of JSC
«International Information
Technology University»



Issakhov A.

«28» February 2025 Protocol of the AC № 10

EDUCATIONAL PROGRAM

6B06118 Immersive Technologies

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

Code and classification of training area: 6B061 Information and Communication Technology

Group of educational programs: B057 Information Technology

ISCED level: 6

NQR level: 6

ORC level: 6

Awarded academic degree: Bachelor in Information and Communication Technologies, Educational
Program “6B06118 Immersive Technologies”

Duration of study: 3 years

Number of credits: 240

AGREED

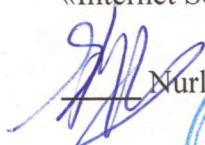
Director of
«KnewIT Programming School» LLC



Bekaitov N.M.

AGREED

Executive Director of
«Internet Society Kazakhstan»



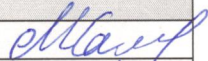

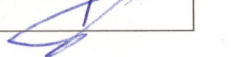
Nurlybayev T.A.



«__»

2025

The code and name of the educational program: 6B06118 Immersive Technologies

№	Educational program developers (Position, scientific degree, academic degree, Full name)	Signature
1	PhD, head of the «CE» Department, assistant professor Mukhanov S.B.	
2	Ph.D., assoc. Professor of the «CE» Department Seilova N.A.	
3	MSc, Senior Lecturer of the «CE» department Turzhanov U.M.	

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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 educational program “6B06118 Immersive Technologies” is aimed at implementing the principles of democratic governance in education, expanding the boundaries of academic freedom and the authority of educational institutions, which will ensure the adaptation of the system of technical and vocational education to the changing needs of society and the labor market economy. The flexibility of the program will allow for consideration of the abilities and needs of individuals, industry, and society.

The program ensures the application of an individual approach to students, the transformation of professional competencies from professional standards and qualification standards into learning outcomes. At the same time, student-centered learning is implemented – an educational principle that shifts the emphasis in the learning process from teaching to learning.

A graduate of this educational program will possess skills such as programming, prototyping of modern XR systems, creation of 3D models, special effects, animations, user-friendly interfaces, optimization and assembly of applications using XR technologies, preparation of design documents reflecting the work of future applications, and artistic design.

The professional field of graduates includes public and private enterprises and organizations engaged in the development, implementation, and use of computer technology and software in various fields, namely: telecommunications, science and education, healthcare, agriculture, mechanical engineering, metallurgy, transport, services, public administration, economics, business, and technology management – practically in all spheres of human activity.

2. Aim and objectives of the educational program

Goal of the EP – to train highly qualified specialists with skills in programming, prototyping modern XR systems, creating 3D models, special effects, animations, user-friendly interfaces, optimization and assembly of XR applications, preparing design documents reflecting the work of future applications, and artistic design. The areas of application include industrial quality control, processing and visualization of medical images, geodesy, robotics, multimedia systems, virtual heritage, special effects in film and television, as well as computer games.

Tasks of the EP:

1. Train versatile specialists with knowledge in mathematics, ICT, and computer science, capable of applying modern information and communication technologies in professional practice.
2. Teach students methods of formalizing the subject area of a software project and developing specifications for software product components.
3. Develop students' ability to design software architecture and ensure continuity and high quality of complex software developments.
4. Teach students to design and develop user interfaces, commercial software components, databases, and embedded software modules.
5. Introduce students to methods and tools for software code analysis to identify and eliminate errors and malfunctions in software operation.
6. Develop students' skills in verifying compliance with specifications, performance, and efficiency indicators of integrated systems, as well as in designing, constructing, and testing software product components.
7. Teach students the basic techniques of creating and editing images in vector editors and the skills of editing photorealistic images in raster editors.
8. Apply modern information technologies to create artistic-design and engineering-technological solutions using computer graphics tools.
9. Apply modern information technologies to create artistic-design and engineering-technological solutions using computer graphics tools.
10. Use fundamental laws of natural sciences in professional activities and operate modern electronic equipment and ICT in accordance with the objectives of the bachelor's educational program.
11. Master methods of formal description, algorithms, and software tools for the implementation of interactive software and technical systems.

12. Analyze prospects and directions of development of the gaming industry.
13. Master skills of software implementation of multimedia systems, virtual, augmented, and mixed reality using various equipment.
14. Apply core practical approaches driven by modern business processes to design complex information security systems of varying levels of complexity, depending on the nature of the object of protection.
15. Apply modern information technologies to create artistic-design and engineering-technological solutions using computer graphics tools.
16. Use knowledge of contemporary problems of science and education when solving educational and professional tasks.
17. Navigate the field of computer processing and generation of animation images, justify the choice of software tools for solving specific tasks, and use core software, hardware, and applied systems of computer animation.
18. Apply modern technologies and methodologies for acquiring, storing, transmitting, and processing big data.
19. Use modern tools and visualization technologies, as well as methodologies for conducting design, pre-design, and other creative and analytical research, and apply these techniques in professional practice.

3. Passport of the academic program

№	Name	Description
1.	Education area code and classification	6B06 Information and Communication Technology
2.	Training direction code and classification	6B061 Information and Communication Technology
3.	Group of academic programs	B057 Information Technology
4.	Name of the educational program	6B06118 Immersive Technologies
5.	Aim of the educational program	Training of highly qualified specialists with skills in programming and prototyping modern XR systems. Application areas include industry, robotics, multimedia systems, special effects in film and television, as well as computer games.
6.	Type of the educational program	New 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	-
10.	Partner University	
11.	Academic degree awarded	Bachelor in Information and Communication Technologies, Educational Program "6B06118 Immersive Technologies"
12.	Duration of study	3 years
13.	Volume of credits	240
14.	Language of education	English

15.	Atlas of new professions	VR/AR/MR Operator VR/AR/MR Editor/Designer VR/AR/MR Developer/Design Engineer
16.	Regional standard	not provided
17.	Availability of an attachment to the training license	provided
18.	License number for the training area	KZ81LAM00001263
19.	Availability of program accreditation	IQAA
20.	Generated learning outcomes	<ol style="list-style-type: none"> 1. Demonstrate the ability to use basic mathematical tools. 2. Know the methods and tools of computer graphics and geometric modeling, the basics of vector and raster graphics, theoretical aspects of fractal graphics, fundamental methods of computational geometry, algorithmic and mathematical foundations of building realistic scenes, and issues of implementing computer graphics algorithms using computers. 3. Apply various software development tools, user interface tools, and data storage and processing systems to ensure the software life cycle. 4. Be able to select visualization methods and scenarios appropriate to the subject area and the studied problem, and effectively apply visualization tools to solve applied tasks. 5. Independently and critically analyze modern sources, draw conclusions, justify them, and make decisions based on the information. 6. Be able to use the acquired knowledge in the chosen additional educational program. 7. Possess skills in selecting, designing, implementing, evaluating the quality, and analyzing the efficiency of software to solve tasks in various subject areas. 8. Design logical schemes of relational and non-relational databases for both simple and complex defined systems. 9. Know the basic concepts and directions in computer information security, principles of information protection, principles of classification and examples of threats to computer systems, modern approaches to the protection of IT products and systems implemented in current national and international IT security standards, and key tools for ensuring multi-level security in information systems. 10. Explain the execution flow of programs in a high-level programming language at the instruction level; use a wide range of memory technologies, both internal and external; write program code for bit manipulation in the processor

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

№	Name of Professional Standard	Job Profile	Job Functions
1	Graphic and Multimedia Design Development	Multimedia Designer	Development of a project structure with multimedia elements.
		Graphic Designer	Managing the development of visual information objects; project design; development and composition of visual information objects.
		Interactive Designer	Development of interactive design in the project; combining content, graphics, visual and sound effects; adding animation to interactive interface elements; documenting interactive design.
2	Testing Multimedia Applications (including Computer Games)	Game Developer	Planning and designing game architecture and developing code algorithms; implementing technical standards in gameplay, graphics, sound, and functionality.
		Multimedia Developer	Designing, developing, and integrating specialized inputs from program code; developing complex graphics and animation design.
		Animator/Animation Developer	Designing animated film production; creating storyboards, drawings, animatics of animated scenes; performing rendering and compositing of animation.
		Game Development Specialist	Conducting analysis and monitoring of the video game market; developing and commissioning computer games.
		3D Generalist	Creating 3D models of objects (fantasy or realistic); developing dynamics in 3D objects.

5. List of the EP competencies

List of Competencies of the Educational Program:

GEC1. Know socio-ethical values, the basics of the legal system and legislation of the Republic of Kazakhstan, the culture, history, and traditions of the peoples of Kazakhstan, the foundations of philosophy, ecology, and sustainable development, and be able to apply them in professional activities.

GEC2. Possess written and oral communication skills in the state, Russian, and English languages, and be able to express thoughts logically, clearly, and argumentatively in both oral and written form.

GEC3. Demonstrate the basics of physical culture, principles of a healthy lifestyle, personal and social development skills, teamwork ability, and leadership qualities.

BC1. Apply methods of mathematical analysis, algebra, geometry, discrete mathematics, probability theory and statistics, as well as physics and informatics to solve engineering and applied tasks.

BC2. Use modern information and communication technologies, algorithmization, and object-oriented programming to solve tasks of varying complexity.

BC3. Analyze the architecture and components of computer systems, understand the principles of building and functioning of software and hardware.

PC1. Formalize the subject area of a software project and develop specifications for software product components.

PC2. Design and develop user interfaces, databases, embedded modules, and software components.

PC3. Select and use software, DBMS, and programming languages depending on the project tasks.

PC4. Manage the software development process, development team, and evaluate the efficiency and cost-effectiveness of projects.

PC5. Design, configure, and operate computer systems, networks, and distributed computing environments.

PC6. Apply data analysis and processing methods, use artificial intelligence, machine learning, and knowledge extraction tools.

PC7. Develop and operate robotic systems, AR/VR systems, digital twin technologies, and virtual modeling.

PC8. Create 3D visualizations, animation, and multimedia content using modern computer graphics technologies, HCI, and UI/UX design.

6. List of learning outcomes of the EP

LO1. Demonstrate the ability to use basic mathematical tools.

LO2. Know the methods and tools of computer graphics and geometric modeling, the basics of vector and raster graphics, theoretical aspects of fractal graphics, fundamental methods of computational geometry, algorithmic and mathematical foundations of constructing realistic scenes, and issues of implementing computer graphics algorithms using computers.

LO3. Apply various software development tools, user interface tools, and data storage and processing systems to ensure the software life cycle.

LO4. Be able to select visualization methods and scenarios appropriate to the subject area and the problem under study, and effectively apply visualization tools to solve applied tasks.

LO5. Independently and critically analyze modern sources, draw conclusions, justify them, and make decisions based on the information.

LO6. Be able to apply the acquired knowledge in the chosen additional educational program.

LO7. Possess skills in selecting, designing, implementing, evaluating quality, and analyzing the effectiveness of software for solving tasks in various subject areas.

LO8. Design logical schemes of relational and non-relational databases for both simple and complex defined systems.

LO9. Know the basic concepts and directions in computer information security, principles of information protection, classification principles and examples of computer system threats, modern approaches to IT product and system protection implemented in national and international IT security standards, and key tools for ensuring multi-level security in information systems.

LO10. Explain the execution flow of programs in a high-level programming language at the instruction level; use a wide range of memory technologies, both internal and external; write program code for bit manipulation in the processor

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
GEC1					V	V				
GEC2					V	V				
GEC3						V				
BC1	V									
BC2			V				V			V
BC3								V	V	
PC1			V							
PC2			V						V	
PC3									V	V
PC4								V	V	
PC5										
PC6				V						
PC7	V	V							V	
PC8	V	V	V							

8. The relationship of LO with labor functions

№	LO	Job Functions
1	LO1, LO10	Application of mathematics and algorithms in programming; code analysis and optimization; use of tools for solving applied tasks.
2	LO2, LO4	Development of graphic applications; modeling of objects and scenes; selection and application of visualization methods in applied tasks.
3	LO3, LO7	Design, development, testing, and maintenance of software systems; creation of interfaces, data storage, and processing systems.
4	LO8, LO9	Design and administration of relational and non-relational databases; ensuring information security and implementation of security tools.
5	LO5, LO6	Critical analysis of information; work with modern sources; preparation of reports and decisions; application of knowledge for professional development and lifelong learning.

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

Competency	Learning Outcomes (LO)	Assessment Criteria	Assessment Methods
General Education Competencies			
GEC1	LO5: Analysis of modern sources, formulation of conclusions, justification of decisions	Clarity of speech, logical reasoning	Oral questioning, essay, presentation
GEC2	LO6: Use of knowledge in additional education program	Argumentation, literacy of speech	Report, presentation, test

GEC3	LO6: Demonstration of self-development skills, healthy lifestyle, teamwork	Activity, independence, involvement	Practical classes, pass/fail test
Basic Competencies			
BC1	LO1: Use of mathematical tools	Correctness of calculations, logic of solution	Testing, problem-solving tasks, midterm control
BC2	LO10: Writing code, working with memory, explaining program execution	Understanding of architecture, code correctness	Laboratory work, test
BC3	LO3: Application of software development tools	Adequacy of tool selection, stability of operation	Course project, project work
Professional Competencies			
PC1	LO7: Design, implementation, and evaluation of software	Prototype implementation, system stability	Project, testing, defense
PC2	LO8, LO3: Database design; development of interfaces and storage systems	Functionality, compliance with technical requirements	Course project, project work
PC3	LO9: Knowledge of information security fundamentals	Correct application of security measures	Test, project, defense
PC4	LO7: Management of software development process and team	Compliance of models with requirements, efficiency of solutions	Project, defense, presentation
PC5	LO9: Design and operation of computer systems and networks	Prototype implementation, reliability	Project, laboratory work
PC6	LO4: Selection of visualization methods and scenarios	Method-task alignment, correctness of visualization	Course project, project work
PC7	LO2: Development of AR/VR systems and digital twin technologies	Technical accuracy, creativity	Project, defense, presentation
PC8	LO2: Development of AR/VR systems and digital twin technologies; creation of 3D visualizations,	Creativity, technical accuracy	Course project, project work

	animations, multimedia		
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10. Information about the modules of the educational program

Module Code and Name	Workload	Learning Outcomes	Assessment Criteria	Disciplines
GENERAL EDUCATION MODULES				
OOM6002 Language and ICT Skills Development Module	25	The student understands the role and importance of academic English and ICT skills in educational and professional activities, principles of academic writing, reading and oral communication in English, basic ICT tools and their application in educational and research activities, modern digital tools for processing, presenting and sharing information, rules of information security and ethics in the digital environment.	Testing, oral questioning, report, course project, presentation, midterm control.	LAN6001A Foreign Language
				ICT6001 Information and Communication Technologies
				LAN6002A Foreign Language
				LAN6001KR Kazakh (Russian) Language
				LAN6002KR Kazakh (Russian) Language
OOM6003 Physical Culture Module	8	The student understands the role of physical culture in forming a healthy lifestyle, fundamentals of the physiological impact of physical activity on the body, methods of self-improvement, safety rules in exercise, and the importance of motor activity for professional and social adaptation.	Testing, oral questioning, report, course project, presentation, midterm control.	PhC6005 Physical Culture
				PhC6006 Physical Culture
				HK6002 History of Kazakhstan
OOM6004 Personal and Social Development Module	18	The student understands the essence and values of socio-cultural development of personality, features of intercultural communication, norms of ethics and tolerance in modern society, the role of culture in shaping civic identity, the importance of social responsibility and volunteer activity.	Testing, oral questioning, report, course project, presentation, midterm control.	SPS6001 Philosophy
				SPS6006 Cultural Studies-Psychology
				SPS6007 Sociology-Political Science
				HUM6400 Inclusive Education.
OOM6004 Personal and Social Development Module	5	The student understands principles of personal growth and self-realization, basics of effective communication and leadership, mechanisms of social adaptation and teamwork, the role of emotional intelligence and critical	Testing, oral questioning, report, course project, presentation, midterm control.	

		thinking, and the significance of active citizenship in society.		
BM6307 Programming Methods and Digital Technologies – 30 credits Learning outcomes	30	<p>he student acquires fundamental knowledge in algorithmization, object-oriented and web programming, as well as methods of software design and architecture. Gains skills in applying digital technologies, including Unity basics and digital image processing, to solve applied tasks. Can develop, test, and visualize software products, use modern tools and approaches for effective systems. The knowledge allows integration of various technologies into a unified software environment adapted to specific tasks.</p>	<p>Testing, oral questioning, report, course project, presentation, midterm control.</p>	SFT6006 Algorithmization and Programming SFT6306 Software Architecture and Design SFT6007 Web Technologies FT6002 Object-Oriented Programming SFT6327 Basics of Unity VRT6388 Digital Image Processing
				MAT6001 Algebra and Geometry EGR6302 Information Theory MAT6003 Discrete Mathematics PHY6001 Physics MAT6304 Mathematical Analysis MAT6004 Probability Theory and Statistics
BM6305 Basic and Applied Aspects of Mathematics and Physics	30	<p>The student masters fundamental and applied mathematics and physics: algebra, geometry, mathematical analysis, discrete mathematics, probability theory, mathematical statistics. Understands fundamental physical laws, basics of optics and information theory, and applies them for analysis and problem solving. Can perform mathematical modeling, data processing, and justify engineering decisions. These methods develop systemic thinking and readiness for complex scientific and technical tasks.</p>	<p>Testing, oral questioning, report, course project, presentation, midterm control.</p>	

			EEC6600 Optics
BM6306 Modern Technologies and Professional Skills Module	24	The student masters modern software development technologies, including basics of AI and project management methods. Gains professional skills during academic, industrial, and pre-graduation practice, applying theoretical knowledge in real work. Can plan and implement projects, work in a team, analyze efficiency of solutions. Competencies enable confident operation in professional IT environments.	Testing, oral questioning, report, course project, presentation, midterm control.
			EP6301 Educational Practice
			IP6305 Industrial Practice
			SFT6375 Basics of Artificial Intelligence
			PM6301 Project Management
			PP6304 Pre-Diploma Practice
PROFESSIONAL MODULES			
PM6305 Computer Graphics, AR/VR and Data Processing Systems	52	The student masters database design and SQL, graphic design, animation and visual effects. Gains knowledge of AR/VR technologies and XR design, HCI and UI/UX basics for virtual and augmented environments. Can apply tools of physical process modeling, computer vision and pattern recognition to solve applied problems. Competencies allow development of interactive VR/AR applications and digital products with effective user experience.	Testing, oral questioning, report, course project, presentation, midterm control.
			SFT6305 Database Design & SQL
			SFT6381 Basics of Graphic Design
			SFT6379 Introduction to AR/VR
			SFT6382 Virtual Modeling of Physical Processes
			SFT6300 XR Systems Design
			SFT6388 HCI – UI/UX in AR/VR

PM6306 Computer Systems, Blockchain and Interactive Technologies				RT6384 Pattern Recognition Systems
				VRT6389 Virtual Reality Systems
				VRT6387 Computer Vision
				SFT6385 Animation and Visual Effects
				3DM3307 3D Modeling
				SFT6378 Introduction to Machine Learning
				VRT6386 Digital Twin Technologies + BIM
				SFT6376 Microsoft .NET Framework – Application Development
				SFT6374 Visual Information and Data Visualization
				SFT6374 Computer Systems Architecture and Organization
			SFT6319 Blockchain Technology	
	25	The student learns 3D modeling, machine learning, digital twin technologies (BIM). Gains skills in .NET application development, computer game creation, and studies principles of computer systems architecture and organization. Understands data visualization and visual information handling, blockchain technology and its applications. Competencies enable contribution to modern digital products integrating 3D models, intelligent algorithms, gaming technologies and e-sports solutions.	Testing, oral questioning, report, course project, presentation, midterm control.	

				SFT6377 Game Development
				SFT6337 E-sports

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.	ICT6001 – Information and Communication Technologies	The course examines information and communication technologies as modern methods and tools for human interaction in everyday and professional activities. It covers the use of IT for searching, collecting, storing, processing, and disseminating information.	5	LO3, LO5	None	None
2.	LAN6001A – Foreign Language	The course includes an intensive English language program focused on grammar and speaking skills. It covers topics reflecting the latest developments in information technology, with a terminological vocabulary directly aligned with students' professional needs.	5	LO5	None	None
3.	LAN6002A – Foreign Language	The course provides an intensive English language program with emphasis on grammar and oral communication. It introduces topics on the latest IT achievements and includes a terminological glossary, making the content directly relevant to students' academic and professional requirements.	5	LO7, LO2, LO3, LO4, LO5, LO6	None	None
4.	LAN6001KR – Kazakh (Russian) Language	The course plays a special role in the training of engineering undergraduates. For technical university students, studying professional Kazakh/Russian is not only about improving skills acquired at school but also a tool for mastering their future specialty.	5	LO5	None	None
5.	LAN6002KR – Kazakh (Russian) Language	The course plays a special role in the training of engineering undergraduates. For technical university students, studying professional Kazakh/Russian is not only about improving skills acquired at school but also a tool for mastering their future specialty.	5	LO5	None	None
6.	PhC6005 – Physical Culture	The course is aimed at developing students' physical culture and the ability to purposefully use various means of physical training to maintain and strengthen health.	4	LO6	None	None
7.	PhC6006 – Physical Culture	The course is aimed at developing students' physical culture and the ability to purposefully use various means of physical training to maintain and strengthen health.	4	LO6	None	None
8.	SPS6007 – Sociology and Political Science	The course provides general political knowledge for ICT specialties. It covers political self-awareness, development of political views, and communication competencies. It also introduces	4	LO5	None	None

		sociology, research methods, and major sociological theories, helping students develop sociological imagination and understand the core concepts of sociology as a science. Курс включает в себя знания социологических предметных областей, методов исследования и направлений. В ходе курса будут подробно обсуждаться основные социологические теории и наиболее эффективные способы получения глубоких знаний о различных аспектах нашего современного общества. Особое значение данного курса для студентов является развивать социологическое воображение, понять основные концепции социологии как науки.				
9.	SPS6006 – Culturology and Psychology	The course explores psychology in educational and social contexts, forming skills applicable to personal, family, professional, and public life. It also examines challenges in modern teaching and cultural development, covering topics such as morphology, semiotics, nomadic culture of Kazakhstan, cultural heritage, and globalization processes.	4	LO5	None	None
10.	SPS6001 – Philosophy	The course studies philosophy as a unique form of intellectual activity in its cultural-historical development and modern context. It introduces the main schools and problems of world and Kazakh philosophy, helping students understand general principles of life, the human-nature relationship, and spiritual development.	5	LO5	None	None
11.	HK6002 – History of Kazakhstan	The course examines the modern history of Kazakhstan as part of world and Eurasian history. It covers key events, processes, and phenomena of the 20th century to the present day, focusing on historical patterns and the development of Kazakh identity in the global context.	5	LO5	None	None
Cycle of General Education Disciplines (GED) Elective Component (EC)						
12.	ECO6007 – Fundamentals of Economics and Financial Literacy	This course provides an introduction to economics and legal foundations relevant to entrepreneurial decision-making and personal finance. Students will learn key economic principles, explore legal systems affecting individuals and businesses, and develop skills in budgeting, taxation, investments, and financial case analysis. Designed for students without prior economics background.	5	LO5	None	None
13.	MGT6706 – Startups and Entrepreneurship	The course introduces students to the fundamentals of business creation and management. Topics include forms of ownership, production processes, marketing, finance, HR management, and	5	LO5, LO7	None	Diploma Project

		organizational operations. Students will understand how businesses function and acquire the skills necessary to initiate and manage entrepreneurial projects.				
14.	JUR6413 – Fundamentals of Life Safety	The course examines safe human interaction with the environment (industrial, domestic, urban, and natural). It covers sustainable functioning of organizations in emergencies, protection from harmful factors, prevention and elimination of natural and man-made disasters, and modern means of safety and risk reduction.	5	LO5	Sociology and Political Science	Diploma Project
15.	L LAW6007 – Fundamentals of Law and Anti-Corruption Culture	The course presents legal, economic, and social foundations of anti-corruption. It examines state policy, international practices, conflict of interest regulation, and ethics. Students gain knowledge of legal responsibility, identifying corruption risks, and conducting organizational analysis using research methods.	5	LO5	Culturology and Psychology	Diploma Project
16.	RM6001 – Research Methodology	The course develops students' ability to make independent theoretical and practical judgments, critically evaluate scientific information, and apply research methods in education. It fosters scientific inquiry and prepares students for conducting diploma projects, ensuring academic integrity and systematic research skills.	5	LO5	Culturology and Psychology	Diploma Project
17.	JUR6505 – Ecology and Sustainable Development	The course highlights the role of ecology in addressing modern economic, social, and political challenges. Students study global environmental problems, sustainable development strategies, international cooperation, and practical aspects of ecology such as resource management and pollution control.	5	LO5	Sociology and Political Science	Diploma Project
18.	HUM6400 – Inclusive Education	The course explores philosophy, history, and methodology of inclusive education. It covers regulations in higher education, the needs of students with disabilities, adapted curricula, teaching strategies, and psychological-pedagogical support. Students learn to design inclusive programs and promote accessibility in education.	5	LO5	Sociology and Political Science	Diploma Project
Cycle of Basic Disciplines (BD)						
University Component (UC)						
19.	SFT6006 Algorithmization and Programming	An introductory programming course covering linear, conditional, and iterative algorithmic structures. Students work with one-dimensional and two-dimensional arrays, strings in C++, and procedural programming. The course introduces functions, standard modules, and programming practices necessary for solving applied computational tasks.	5	LO10, LO3	None	None
20.	SFT6306	The course examines the decomposition of large software systems into subsystems and components. Students study various	5	LO7, LO3	Application Development	None

	Software Architecture and Design	notations and formalisms, detailed design, UML diagrams, and the role of architecture in risk management. Emphasis is placed on producing detailed specifications and ensuring system consistency.			ment, Basics, Algorithmization and Programming	
21.	SFT6007 Web Technologies	The course teaches the fundamentals of website development using HTML, CSS, JavaScript, and JQuery. Students gain skills in PHP programming, MySQL databases, and creating secure client-server web applications, integrating front-end and back-end development into complete interactive solutions.	5	LO3, LO8	Application Development Basics, Algorithmization and Programming	None
22.	SFT6002 Object-Oriented Programming	The course provides skills in developing console and desktop applications using Java. Topics include OOP paradigms, file processing, exception handling, structures, collections, and object-oriented design. Students acquire experience in modular programming and software development with a focus on reusability and maintainability.	5	LO3, LO10	Application Development Basics, Algorithmization and Programming	None
23.	SFT6327 Fundamentals of Unity	This course introduces students to Unity as a development environment. It covers the interface, basic tools, scripting, and project creation. Students learn to import external packages, create interactive user interfaces, and deploy applications across platforms, developing fundamental XR project skills.	5	LO2, LO3	Algorithmization and Programming	None
24.	VRT6388 Digital Image Processing	The course provides knowledge of digital image processing techniques with a focus on immersive applications such as VR and AR. Students study key algorithms for image enhancement, transformation, and analysis, applying them to create realistic visual effects and interactive experiences.	5	LO2, LO4	Algebra and Geometry, Mathematical Analysis, Introduction to Programming	Data Processing System
25.	MAT 6001 Algebra and Geometry	The course introduces analytic geometry and linear algebra as fundamental tools for problem solving. Students study matrices, vectors, vector spaces, linear transformations, and systems of linear equations, as well as geometric figures, coordinates, and equations of curves and surfaces of the second order.	4	LO1	None	None
26.	EGR6302 Information Theory	The course covers theoretical and practical aspects of information theory. Topics include entropy, methods of measurement, optimal coding, noise-resistant coding, and data transmission systems. Students develop understanding of the principles of information quantification and apply coding methods in communication systems.	5	LO1	None	None

27.	MAT6003 Discrete Mathematics	This course explores discrete objects and logic elements, combinatorial problem solving, mappings, and binary relations. Students learn to convert logical formulas into normal forms and apply Boolean algebra to switching theory, building skills in analysis, synthesis, and algorithmic thinking.	4	LO1	None	None
28.	PHY6001 Physics	The course introduces the fundamental laws and equations of mechanics, molecular physics, thermodynamics, electricity, and magnetism. Students apply physical methods for problem solving, conducting laboratory work to test natural laws, and using physics in engineering and technical contexts.	4	LO1	None	None
29.	MAT6304 Mathematical Analysis	The course provides knowledge of differential and integral calculus, infinite sequences, and series. Students learn fundamental techniques for analyzing infinitesimal variables, applying calculus methods in computer science and engineering to solve applied tasks and model real-world phenomena.	4	LO1	None	None
30.	MAT6004 Probability Theory and Mathematical Statistics	The course focuses on probability theory and statistical methods, exploring stochastic processes, distributions, and hypothesis testing. It integrates mathematics with programming, strengthening logical and algorithmic thinking. Students gain skills for analyzing data and modeling uncertainty in applied problems.	4	LO1	None	None
31.	EEC6600 Optics	The course introduces the principles of optics and its applications in immersive technologies. Students study the wave and particle nature of light, light-matter interaction, and optical systems. Emphasis is placed on applying optical phenomena in VR and AR systems.	5	LO1	Physics	None
32.	EP6301 Educational Practice	The course aims at acquiring primary professional skills and consolidating knowledge through independent solution of tasks in algorithmization, design, and implementation of programs using modern programming technologies. Students practice applying theoretical knowledge in real working conditions.	2	LO3, LO6	Algorithmic Languages and Programming	Industrial Practice
33.	IP6305 Industrial Practice	This practice provides students with real industrial experience in solving tasks in the field of software development. Students apply theoretical knowledge in a professional setting, gaining skills in teamwork, project execution, and adapting to workplace standards and requirements.	7	LO7, LO3, LO5	None	None
34.	SFT6375 Fundamentals of Artificial Intelligence	The course introduces the basic concepts, methods, and techniques of Artificial Intelligence (AI) with applications in immersive technologies. Students study algorithms for machine learning and intelligent systems to design unique	5	LO6	Algebra and Geometry, Mathematical	Computer Vision

		immersive experiences and interactions with virtual environments.			Analysis, Introduction to Programming	
35.	PM6301 Project Management	This course develops knowledge of project management theory and methodology, innovation processes, and project life cycles. Students learn strategies for innovative organizational development, methods of managing projects and programs, and skills for evaluating efficiency in professional practice.	5	LO7, LO5	Fundamentals of Application Development	None
36.	PP6304 Pre-Diploma Practice	The course is aimed at preparing students for the final diploma project by collecting and analyzing materials, defining research problems, and developing project documentation. Students apply accumulated theoretical knowledge to real tasks in their chosen field.	5	LO7, LO5	None	None
Cycle of Major Disciplines (MD)						
Elective Component (EC)						
37.	3DM 3307 3D Modeling	The course introduces the fundamentals of polygonal modeling, texturing, lighting, and rendering. Students learn to create high-quality 3D models for animation, computer games, and film production, acquiring practical skills for designing realistic and creative digital assets.	5	LO8, LO3	None	None
38.	SFT6378 Introduction to Machine Learning	The course provides students with fundamental knowledge of machine learning concepts, methods, and algorithms, with a focus on their applications in immersive technologies such as VR, AR, and MR. Students develop skills in applying ML to analyze and solve applied problems.	5	LO4, LO2	None	None
39.	VRT6386 Digital Twin Development Technologies + BIM	The course introduces students to the concepts and tools of digital twin development and Building Information Modeling (BIM). Students gain skills in creating digital models of objects and systems using modern simulation technologies for design, engineering, and infrastructure applications.	5	LO4, LO2	None	None
40.	SFT6376 Microsoft .NET Framework: Application Development	The course focuses on developing applications using Microsoft .NET Framework. Students study programming with C# and VB.NET, work with Visual Studio, and design applications using Windows Forms, ASP.NET, ADO.NET, and WPF, gaining practical skills in building modern software solutions.	5	LO4, LO2	None	None
41.	VRT6389 Visual Information and Data Visualization	The course explores methods of visual data representation, including charts, graphs, and interactive tools. Students learn principles of visual coding, design of effective visualizations, and application of software tools and	5	LO2, LO7	None	None

		programming libraries for analyzing and presenting data.				
42.	SFT6374 Computer Systems Architecture and Organization	This course provides an in-depth study of computer architecture, system organization, and design principles. Students gain an understanding of hardware structure, system efficiency, and reliability, preparing them for careers in computer engineering, system administration, and embedded systems development.	5	LO4, LO3	None	None
43.	SFT6319 Blockchain Technology	The course examines blockchain fundamentals, including its advantages, limitations, and applications in various industries such as finance, logistics, and healthcare. Students learn about cryptocurrencies, tokens, and smart contracts, developing practical skills to apply blockchain solutions in real projects.	5	LO6, LO2	None	None
44.	SFT6377 Computer Game Development	This course covers the principles, methods, and tools for developing computer games, including immersive technologies such as VR and AR. Students gain hands-on experience in designing and programming interactive games that provide engaging and immersive user experiences.	5	LO2, LO7	None	None
45.	SFT6337 Cybersport	The course introduces students to the esports industry, game strategies, teamwork, and the organization of competitions in digital environments. Students gain knowledge of the structure and functioning of the cybersport ecosystem, preparing them for professional engagement in esports activities.	5	LO2, LO7	None	None
Cycle of major disciplines (MD) University component(UK)						
46.	VRT6387 Computer Vision	This discipline is devoted to the study of algorithms and technologies used in computer vision, such as pattern recognition, motion tracking, object detection, etc. Students study the main approaches and methods of computer vision, as well as their application in XR technologies.	5	LO2, LO7	None	None
47.	SFT6385 Animation and Visual Effects	This discipline focuses on the study of animation and visual effects techniques used in XR applications and computer games. Students learn the principles of animation, working with keyframes, rigging and skinning characters, and creating visual effects.	5	LO2, LO7	None	None
48.	SFT6379 Introduction to AR/VR technology	The course is dedicated to augmented and virtual reality, during which students will be told the history of technology development, use cases, development prospects. The elective will let you know how widespread these tools are in the media, entertainment, medicine and industry. It will also talk about exactly	5	LO2, LO7	None	None

		what tools allow you to work with AR / VR, what skills and knowledge you need to acquire in order to successfully master them. The main goal of the course: to talk about AR / VR, principles of work, development tools, areas of application and history of occurrence. In addition, students will be able to get acquainted with current trends in the field, which will allow them to start developing their own projects. The discipline is aimed at developing students' creative thinking and developing critical thinking skills.				
49.	SFT6382 Virtual modeling of physical processes	As part of this discipline, students learn the basics of modeling physical processes using computer simulations. They master techniques for creating three-dimensional models of objects, as well as methods for visualizing and analyzing modeling results. Students also become familiar with the principles of creating physical simulations in various applications, such as physics engines for computer games or programs for simulating natural phenomena.	5	LO2, LO7	None	None
50.	SFT6300 Design of XR systems	The discipline "Design of XR systems" introduces students to the basics of designing augmented and virtual reality systems. Students learn how to create engaging and interactive virtual worlds and develop skills in specialized software and hardware such as Oculus and other popular XR platforms.	5	LO2, LO7	None	None
51.	SFT6381 Graphic Design Fundamentals	Within this discipline, students learn the basics of composition, color, typography and other important aspects of graphic design. They learn the principles of creating effective visual solutions and develop skills in working with graphic tools such as Adobe Photoshop, Illustrator and other popular graphic design programs.	5	LO2, LO7	None	None
52.	SFT6305 Database Design. Introduction to SQL	During the course students will learn how to create relational databases going through all the stages of database design process (conceptual, logical and physical). In the second part of the course students will be introduced with the basics of Structured Query Language (SQL). Within the course work students will design and create databases applying theoretical knowledge in practice.	5	LO2, LO7	None	None
53.	VRT6389 Virtual reality systems	The discipline "Virtual Reality Systems" in the educational program on immersive technologies provides students with the knowledge and skills necessary to understand and develop virtual reality systems. As part of this discipline, students study various components of virtual reality systems, their principles of operation, interaction methods and applications in various fields, such as the	5	LO2, LO7	None	None

		gaming industry, medicine, education, architecture and others.				
54.	VRT6384 Pattern recognition systems	The discipline "Pattern Recognition Systems" is an important component of the educational program, focused on the study and application of algorithms and techniques for pattern recognition and interpretation in various types of data. It equips students with the knowledge and skills needed to develop systems that can automatically detect and analyze patterns, leading to advances in areas such as computer vision, speech recognition, data mining, and machine learning. The discipline "Pattern Recognition Systems" aims to equip students with a comprehensive understanding of algorithms, pattern recognition methods and their practical application. It prepares them for careers in areas such as artificial intelligence, data science, and machine learning, where the ability to recognize and interpret patterns is vital to advancing technology and solving complex problems.	5	LO2, LO7	None	None
55.	SFT6388 HCI - UI/UX in AR/VR	This discipline focuses on the research and development of user interaction interfaces with XR applications. Students learn the basics of designing user interfaces in XR, including interacting with gestures, voice commands, controllers, and other input devices.	5	LO2, LO7	None	None

12. Curriculum of the educational program (Platonus)

№	Module name	Discipline cycle	Discipline component	Code of discipline	Name of discipline	Academic credits	Academic study period	Control in the academic period			Number of hours							Distribution of credits per academic period																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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47		MD	3DM 3307	3D Modelling	5	3	3	5/150	15	30.0		15	90												
48		MD	EC	SFT6378	5	3	3	5/150	15	30.0		15	90											5.0	
49		MD	EC	VRT6386	5	5	5	5/150	15	30.0		15	90											5.0	
50	PM6306 Computer Systems, Blockchain and Interactive Digital Technologies	MD	EC	SFT6376	5	5	5	5/150	15	30.0		15	90												
51		MD	EC	VRT6389	5	5	5	5/150	15	30.0		15	90											5.0	
52		MD	EC	SFT6374	5	5	5	5/150	15	30.0		15	90											5.0	
53		MD	EC	SFT6319	5	5	5	5/150	15	30.0		15	90												
54		MD	EC	SFT6377	5	5	5	5/150	15	30.0		15	90											5.0	
55		MD		SFT6337	5	5	5	5/150	15	30.0		15	90												
Modules of choice																									
56	PM6304	MD	EC	MIN601	5	3	3	5/150	15	30.0		15	90												
57	Module of Minor	MD	EC	MIN602	5	4	4	5/150	15	30.0		15	90											5.0	
58	Components	MD	EC	MIN603	5	5	5	5/150	15	30.0		15	90												5.0
Weekly average workload at hours																									
1		General education disciplines (GED)				56																			
		Required component (GED/RC)				51																			
		University component (GED/UC)				0																			
		Elective component (GED/EC)				5																			
2		Basic disciplines (BD)				84																			
		Required component (BD/RC)				0																			
		University component (BD/UC)				84																			
		Elective component (BD/EC)				0																			
3		Major disciplines (MD)				92																			
		Required component (MD/RC)				0																			
		University component (MD/UC)				52																			
		Elective component (MD/EC)				40																			
4		Disciplines for the formation of professional competencies (BDFPC)				0																			
		Required component (BDFPC/RC)				0																			
		University component (BDFPC/UC)				0																			
		Elective component (BDFPC/EC)				0																			
5		Disciplines of personal development and the formation of leadership qualities(BDPD)				0																			
		Required component (BDFPC/RC)				0																			
		University component (BDFPC/UC)				0																			
		Elective component (BDFPC/EC)				0																			
		Total on curriculum				232				0	0	6360	555	810	510	0	420	615	3450	38	42	43	37	41	31
6		Additional courses																							

7	Module of final certification (MoFC)	8	240.0	
	Total including FC	240	7200.0	

13. Additional Educational Programs (Minor)

Name of Minor Program		Total Credits / Credits per Course	Description, Competencies and Learning Outcomes
Additional Educational Program (Minor)		15	The Additional Educational Program (Minor) is a set of courses and/or modules and other types of academic work chosen by the student in order to develop additional competencies. Development of additional professional skills and competencies in the selected field.
MIN601 Minor 1		5	
MIN602 Minor 2		5	
MIN603 Minor 3		5	