“Халықаралық ақпараттық технологиялар университеті” АҚ

АО “Международный университет информационных технологий”

AGREED
Chairperson
of the Academic and Methodological Council
IITU JSC

_____ _____

«___» _____ 2026 AMC Minutes №___

APPROVED BY
Acting Chairperson of the Management Board – Rector
International Information Technology University JSC

_____ _____

«___» _____ 2026 Academic Council Minutes №___

EDUCATIONAL PROGRAMME

6B06110 Software Engineering

(code and title of the educational programme)

Code and classification of education area: 6B06 Information and Communication Technologies

Code and classification of field of study: 6B061 Information and Communication Technologies

Group of educational programmes: B057 Information Technology

ISCED level: 6

NQF level: 6

SQF level: 6

Academic degree awarded: Bachelor in Information and Communication Technologies under the educational programme “6B06110 Software Engineering”

Duration of study: 4 years

Total credits: 240

AGREED
Employer / organization (to be confirmed)

_____
_____

AGREED
Employer / organization (to be confirmed)

_____
_____

Almaty, 2026

Code and title of the educational programme: “6B06110 Software Engineering”

The educational programme was prepared using the Software Engineering curricula for the 2023–2026 intakes; approval of the Academic Committee membership is subject to the department’s decision.

Coordinator _____ Sharipov K.R.

Chair of the Academic Committee _____ Chinibayeva T.T.

Chair of the Faculty Academic Quality Council _____ Seilova N.A.

Director of the Department of Academic and Methodological Affairs _____ Adzhibayeva A.Sh.

Contents

List of Abbreviations and Symbols 4

1. Description of the Educational Programme 5
2. Aim and Objectives of the Educational Programme 5
3. General Information on the Educational Programme 6
4. Programme Learning Outcomes (LO) 6
5. Programme Competencies 6
6. Matrix of Programme Learning Outcomes and Competencies (V) 7
7. Matrix of Courses and Programme Learning Outcomes (V) 8
8. Professional Standards (PS), Occupation Profiles and Job Functions 10
9. Atlas of Emerging Occupations 10
10. Core Courses of the Educational Programme 10
11. Content of Educational Programme Modules 11
12. Course Information for the Educational Programme 12
13. Curriculum 21

List of Abbreviations and Symbols

BD	Cycle of Basic Disciplines
BC	Basic Competency
BM	Basic Module
UC	University Component
HE	Higher Education
SES	State Educational Standard
ATL	Additional Types of Learning
EQF	European Qualifications Framework
ETF	European Training Foundation
KSA	Knowledge, Skills and Abilities
FA	Final Assessment
EC	Elective Component
ISCED	International Standard Classification of Education
NQF	National Qualifications Framework
NQS	National Qualifications System
GHM	General Humanities Module
CC	Compulsory Component
GEM	General Education Module
GED	Cycle of General Education Disciplines
EP	Educational Programme
GPM	General Professional Module
SQF	Sectoral Qualifications Framework
GEC	General Education Competency
MD	Cycle of Major Disciplines
PP	Professional Practice
PS	Professional Standard
PGE	Postgraduate Education
PC	Professional Competency
PM	Professional Module
LO	Learning Outcome
QMS	Quality Management System

1. Description of the Educational Programme

The 6B06110 Software Engineering programme prepares specialists in the design, development, testing and maintenance of software products. It combines foundational training in mathematics, algorithms and data structures with application development, software project management and hands-on experience with modern technology platforms.

Flexibility is provided through the choice of electives and Minor pathways. Students study Python programming, object-oriented development, information systems and databases, web technologies and systems integration, with practical placements and the development of the digital economy providing the context.

A distinctive feature of the programme is its focus on the entire software product lifecycle: requirements analysis, UI/UX prototyping, client- and server-side implementation, testing, DevOps, information security and operations. Selected elective pathways cover mobile applications, .NET, Qt and blockchain.

The programme develops skills in algorithmic problem analysis, software component design, working with relational databases and APIs, test automation, teamwork, project management and documentation. Practical classes, applied projects, industrial placements and pre-diploma practice are especially important.

The programme reflects advances in artificial intelligence, data analytics, parallel programming, modern user interfaces and secure application deployment. Courses are designed to develop critical thinking, professional communication and the ability to update skills independently.

Graduates may work in IT organisations, financial and telecommunications companies, industry, education, healthcare and the public sector. Potential roles include software developer, web/full-stack developer, mobile application developer, QA engineer, DevOps engineer, data analyst and IT project coordinator.

2. Aim and Objectives of the Educational Programme

The programme aims to prepare qualified Software Engineering graduates able to analyse requirements, design architecture, develop, test, deploy and maintain reliable software using modern methodologies, programming languages and collaborative development tools.

Programme objectives:

1. Provide a strong foundation in mathematics, logic, statistics, discrete structures and computer science for solving applied software engineering problems.
2. Develop algorithmic thinking and the ability to create efficient programs using modern programming languages, data structures and object-oriented design principles.
3. Teach students to analyse requirements and design software architectures, databases, interfaces and interactions among software components.
4. Build practical competence in developing web, server, mobile and desktop applications using selected technology platforms.
5. Develop knowledge and skills in software quality assurance, automated testing, debugging, version control and software documentation.
6. Teach the design of data storage and processing structures and the use of SQL and programmatic data-access interfaces.
7. Develop skills in data analysis and the application of artificial intelligence and parallel computing methods to applied IT tasks.
8. Provide knowledge of secure development, software cybersecurity, DevOps and automated deployment principles.
9. Develop skills in IT project management, teamwork, client communication and software product lifecycle organisation.

10. Develop research competencies, independent learning of new technologies, professional ethics and readiness for further education.

3. General Information on the Educational Programme

№	Name	Description
1.	**Educational Programme Title**	6B06110 Software Engineering
2.	**Group of Educational Programmes**	B057 Information Technology
3.	**Code and Classification of Field of Study**	6B061 Information and Communication Technologies
4.	**Code and Classification of Education Area**	6B06 Information and Communication Technologies
5.	**Type of Educational Programme**	Existing programme / status for the 2026 intake to be confirmed
6.	**National Qualifications Framework Level**	6
7.	**Sectoral Qualifications Framework Level**	6
8.	**Distinctive Features of the Programme**	Software development; web and mobile technologies; testing, DevOps, Minor
8.1	**Partner University**	No information on SE partner institutions provided — to be confirmed
9.	**Academic Degree Awarded**	Bachelor in Information and Communication Technologies, educational programme “6B06110 Software Engineering”
10.	**Duration of Study**	4 years (standard pathway); shortened pathway under a separate curriculum
11.	**Total Credits**	240
12.	**Language of Instruction**	To be confirmed from the approved programme passport
13.	**Licence Number for the Field of Study**	To be confirmed against university documents
14.	**Availability of Licence Annex for the Field of Study**	To be confirmed
15.	**Programme Accreditation Status**	To be confirmed from programme accreditation documents

4. Programme Learning Outcomes (LO)

LO	Learning Outcomes
LO1	Apply mathematical, logical and statistical methods to analyse and solve software engineering problems.
LO2	Develop algorithms and software modules using data structures, programming paradigms and modern programming languages.
LO3	Design software systems, select architectural solutions and develop client-side, server-side and mobile applications.
LO4	Design databases and implement reliable mechanisms for storing, processing and exchanging information.
LO5	Perform software testing, debugging and quality assessment, and ensure software security and reliability.
LO6	Use tools for collaborative development, version control, CI/CD and software product lifecycle support.
LO7	Apply artificial intelligence, data analytics and parallel computing methods to practical software problems.
LO8	Manage IT projects by identifying requirements, planning activities, assessing risks and presenting project outcomes.
LO9	Design user interfaces with due regard to UX, accessibility and end-user requirements.
LO10	Communicate effectively in the state, Russian and foreign languages; observe professional ethics and consider the societal impacts of digital technologies.
LO11	Plan research, apply interdisciplinary competencies and justify the findings of the graduation project.

5. Programme Competencies

Competency Categories		Programme Competencies
Universal	**U**	Professional ethics, academic integrity, social and legal responsibility.

Competencies	**UC 1**	
	UC 2	Written and oral communication in the state, Russian and foreign languages.
General Professional Competencies	**GPC 1**	Mathematical, logical and algorithmic modelling of professional problems.
	GPC 2	Use of programming languages, tools and technology platforms.
	GPC 3	Understanding the hardware and networking foundations of modern software systems.
Professional Competencies	**PC 1**	Requirements analysis and software architecture and interface design.
	PC 2	Development of client-side, server-side and mobile software components.
	PC 3	Design, integration and maintenance of databases and APIs.
	PC 4	Testing, quality assurance and information security.
	PC 5	DevOps, automation, deployment, monitoring and collaborative development.
	PC 6	Data analysis, artificial intelligence and efficient computing.
	PC 7	Management of digital projects and products.
Research Competencies	**RC 1**	Search, analysis and systematisation of scientific and technical data.
	RC 2	Development and evaluation of innovative software solutions.

6. Matrix of Programme Learning Outcomes and Competencies (V)

Alignment	UC 1	UC 2	GPC 1	GPC 2	GPC 3	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	RC 1	RC 2
LO1			V		V									
LO2			V	V			V							
LO3				V	V	V	V							
LO4				V				V						
LO5									V					V
LO6				V						V		V		
LO7			V								V			V
LO8		V				V						V		
LO9	V					V	V							
LO10	V	V												
LO11												V	V	V

7. Matrix of Courses and Programme Learning Outcomes (V)

№	Course Title	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11
1.	LAN6001A Foreign Language										V	
2.	ICT6001 Information and Communication Technologies			V			V					
3.	SFT6301 Algorithm Design and Programming		V									
4.	MAT6001 Algebra and Geometry	V										
5.	NET6312 Computer Networks			V								
6.	HRD6323 Robotic Systems Engineering			V								
7.	LAN6002A Foreign Language										V	
8.	PhC6005 Physical Education										V	
9.	MAT6002 Mathematical Analysis	V										
10.	EP6301 Training Practice								V			V
11.	SFT6304 Python Programming		V									
12.	ANL6311 Database Theory				V							
13.	SFT6707 UI/UX Design			V						V		
14.	LAN6001KR Kazakh (Russian) Language										V	
15.	PhC6006 Physical Education										V	
16.	MAT6005 Discrete Mathematics	V										
17.	SFT6302 Algorithms and Data Structures		V									
18.	EGR6302 Information Theory	V										
19.	SFT6186 Artificial Intelligence							V				
20.	LAN6003PA Professionally Oriented Foreign Language										V	
21.	HK6002 History of Kazakhstan										V	
22.	IP6302 Industrial Practice								V			V
23.	SPS6001 Philosophy										V	
24.	LAN6002KR Kazakh (Russian) Language										V	
25.	MAT6006 Probability Theory and Mathematical Statistics	V										
26.	SFT6002 Object-Oriented Programming		V									
27.	SPS6006 Cultural Studies–Psychology										V	
28.	SFT6307 Web Technologies			V			V					
29.	HRD6302 Architecture and Organization of Computer Systems			V								

30.	SFT6303 PL/SQL Programming				V							
31.	SFT6309 UX/UI Development			V						V		
32.	SFT6311 Front-end Development			V			V					
33.	SFT6321 QA Testing					V						
34.	SPS6007 Sociology–Political Science										V	
35.	LAN6007K Records Management in the State Language										V	
36.	EGR6301 Operating Systems			V								
37.	PP6305 Industrial Practice								V			V
38.	LAW6007 Fundamentals of Law and Anti-Corruption Culture										V	
39.	ECO6003 Fundamentals of Economic Theory										V	
40.	HUM6400 Inclusive Education and Community Service										V	
41.	ECO6008 Fundamentals of Entrepreneurship and Financial Literacy										V	
42.	ESG6001 Ecology, Sustainable Development and Fundamentals of Life Safety										V	
43.	SFT6313 Mobile Technologies and Applications (Android)			V			V					
44.	SFT6328 iOS Mobile Application Development			V			V					
45.	SFT6319 Blockchain Technology							V				
46.	RM6301 Fundamentals of Research											V
47.	ANL6301 Introduction to Data Science							V				
48.	SFT6325 Parallel Programming							V				
49.	SFT6314 Full Stack Development			V			V					
50.	SFT6376 Microsoft .NET Framework – Application Development			V			V					
51.	SFT6315 DevOps					V	V					
52.	SFT6323 Programming on the Qt Platform			V			V					
53.	PM6301 Project Management								V			
54.	SEC6301 Fundamentals of Information Security					V						
55.	PP6304 Pre-Diploma Practice											V
56.	MIN601 Minor – Course 1											V
57.	MIN602 Minor – Course 2											V
58.	MIN603 Minor – Course 3											V

8. Professional Standards (PS), Occupation Profiles and Job Functions

№	Professional Standard	Occupation Profile	Job Functions	LO
1.	Software development (PS to be confirmed)	Software developer	Design and implementation of software components; testing; documentation	LO2, LO3, LO5
2.	Web development (PS to be confirmed)	Web / Full-stack developer	Client- and server-side development; integration of APIs and databases	LO3, LO4, LO9
3.	Mobile application development (PS to be confirmed)	Mobile developer	Creation, testing and maintenance of mobile applications	LO2, LO3, LO5
4.	Software testing (PS to be confirmed)	QA engineer	Test planning, automated checks and defect reporting	LO5
5.	Software platform operations (PS to be confirmed)	DevOps engineer	CI/CD, build configuration, containerisation and monitoring	LO6, LO9
6.	Data analysis and AI (PS to be confirmed)	Data / AI engineer	Data preparation and analysis; algorithm evaluation	LO1, LO7
7.	IT project management (PS to be confirmed)	IT project manager	Planning, resource management and development coordination	LO8, LO11

9. Atlas of Emerging Occupations

№	Emerging Occupation	Courses
1.	Full-stack developer	SFT6307 Web Technologies; SFT6314 Full Stack Development; ANL6311 Database Theory
2.	Frontend / UI engineer	SFT6707 UI/UX Design; SFT6309 UX/UI Development; SFT6311 Front-end Development
3.	Mobile application developer	SFT6313 Android; SFT6328 iOS; SFT6002 Object-Oriented Programming
4.	QA Automation engineer	SFT6321 QA Testing; SFT6302 Algorithms and Data Structures; SFT6315 DevOps
5.	DevOps / Platform engineer	SFT6315 DevOps; EGR6301 Operating Systems; NET6312 Computer Networks
6.	Data / AI engineer	SFT6186 Artificial Intelligence; ANL6301 Introduction to Data Science; MAT6006 Statistics
7.	Blockchain developer	SFT6319 Blockchain Technology; SFT6302 Algorithms and Data Structures
8.	Software architect	HRD6302 Computer Systems Architecture; SFT6307 Web Technologies; PM6301 Project Management

10. Core Courses of the Educational Programme

№	Course Code and Title	Course Workload (Credits)
1.	SFT6301 — Algorithm Design and Programming	6
2.	SFT6302 — Algorithms and Data Structures	5
3.	SFT6002 — Object-Oriented Programming	5
4.	SFT6304 — Python Programming	5
5.	ANL6311 — Database Theory	5
6.	SFT6307 — Web Technologies	5
7.	HRD6302 — Architecture and Organization of Computer Systems	5
8.	SFT6303 — PL/SQL Programming	5
9.	SFT6707 — UI/UX Design	4
10.	SFT6309 — UX/UI Development	5
11.	SFT6311 — Front-end Development	5
12.	SFT6321 — QA Testing	5
13.	SFT6313 — Mobile Technologies and Applications (Android)	5
14.	SFT6328 — iOS Mobile Application Development	5
15.	ANL6301 — Introduction to Data Science	6
16.	SFT6315 — DevOps	6

11. Content of Educational Programme Modules

Module Code and Title	Module Description	Course Code and Title	Course Semester (in sequence)
GENERAL EDUCATION MODULES			
Module of Social and Humanities Studies (code to be confirmed)	Social and humanities, ethical and civic competencies	HK6002; SPS6001; SPS6006; SPS6007; LAW6007	3–6
Physical Education Module (code to be confirmed)	Healthy lifestyle and physical fitness development	PhC6005; PhC6006	2–3
Languages and ICT Module (code to be confirmed)	Academic and professional communication and digital literacy	LAN6001A; LAN6002A; LAN6001KR; LAN6002KR; LAN6003PA; ICT6001	1–4
Personal and Professional Development Module (code to be confirmed)	Social responsibility, economics and sustainable development	ECO6003; HUM6400; ECO6008; ESG6001	5–6
BASIC MODULES			
Mathematics Module (code to be confirmed)	Mathematics, discrete structures and statistics	MAT6001; MAT6002; MAT6005; MAT6006; EGR6302	1–4
Algorithms and Programming Module (code to be confirmed)	Algorithms, data structures, Python and object-oriented programming	SFT6301; SFT6302; SFT6304; SFT6002	1–4
Systems and Data Module (code to be confirmed)	Computer systems, operating systems, networks and databases	NET6312; HRD6302; EGR6301; ANL6311; SFT6303	1–6
Modern Software Development Module (code to be confirmed)	Web technologies, interface design and secure development	SFT6707; SFT6307; SFT6311; SEC6301	2–8
PROFESSIONAL MODULES			
Web and Mobile Platforms Module (code to be confirmed)	Applications for web, Android, iOS and desktop platforms	SFT6313; SFT6328; SFT6314; SFT6376; SFT6323	5–8
Quality Assurance and DevOps Module (code to be confirmed)	Testing, CI/CD and automated software delivery	SFT6321; SFT6315; SEC6301	5–8
Research, Projects and Practice Module (code to be confirmed)	Research, management, real projects and practical placements	EP6301; IP6302; PP6305; RM6301; PM6301; PP6304	2–8
Minor Module (code to be confirmed)	Additional specialisation in a chosen field	MIN601; MIN602; MIN603 (pathways and codes to be confirmed)	5–7
Data and Intelligent Technologies Module (code to be confirmed)	AI, data analytics, parallel methods and applied electives	SFT6186; ANL6301; SFT6325; SFT6319	3–8

12. Course Information for the Educational Programme

№	Course Code and Title	Brief Course Description (30–50 words)	Course Workload (Credits)	Learning Outcomes Addressed (LO codes)	Prerequisites	Postrequisites
COMPULSORY COMPONENT (CC)						
Cycle of General Education Disciplines (GED)						
1.	LAN6001A Foreign Language	Professional communication in a foreign language, academic writing and understanding of technical materials. Topics include IT terminology, reading documentation, dialogue, presentations and teamwork in an international environment.	5	LO10	–	LAN6002A
2.	ICT6001 Information and Communication Technologies	The course covers digital environment architecture, network services, user information security, document processing and digital tools. Students use software to collect and present information, collaborate and complete educational tasks.	5	LO3, LO6	–	SFT6707, HRD6302
3.	LAN6002A Foreign Language	Language proficiency is developed with emphasis on engineering communication, processing technical information and preparing project documentation in a foreign language. Academic presentations, solution discussions and professional argumentation are practised.	5	LO10	LAN6001A	LAN6003PA
4.	PhC6005 Physical Education	The course studies physical education, motor activity, maintaining performance and preventing physical inactivity. Students develop individual routines for safe physical training and a sustainable healthy lifestyle.	4	LO10	–	–
5.	LAN6001KR Kazakh (Russian) Language	The course develops oral, written and professional communication in Kazakh or Russian. It covers business language conventions, academic texts, field-specific vocabulary and practical communication situations.	5	LO10	–	LAN6002KR
6.	PhC6006 Physical Education	Students continue developing physical	4	LO10	–	–

		fitness, self-monitoring and individual exercise planning. Emphasis is placed on health improvement, team activities, safe organisation of classes and functional performance.				
7.	HK6002 History of Kazakhstan	The course examines key periods in Kazakhstan's history, the formation of statehood and social and cultural processes. It develops historical reasoning, civic responsibility and analytical consideration of public events.	5	LO10	–	–
8.	SPS6001 Philosophy	Students study the fundamentals of philosophy, logic, epistemology, ethics and philosophy of science. The course develops critical thinking, evaluation of arguments and understanding of the social and ethical effects of engineering decisions.	5	LO10	–	RM6301
9.	LAN6002KR Kazakh (Russian) Language	Proficiency in Kazakh or Russian is strengthened for professional communication, presentations, document preparation and discussion of engineering projects. Particular attention is given to precise terminology, argumentation and written information.	5	LO10	LAN6001KR	–
10.	SPS6006 Cultural Studies–Psychology	An integrated course in cultural studies and psychology examining social culture, personality, communication and human behaviour. It builds intercultural skills, critical thinking and awareness in professional interactions.	4	LO10	–	SPS6007
11.	SPS6007 Sociology–Political Science	An integrated course in sociology and political science covering social institutions, social processes and political systems. It develops the ability to assess the societal implications of technologies and make socially responsible decisions.	4	LO10	SPS6006	–
UNIVERSITY COMPONENT (UC)						
Cycle of Basic Disciplines (BD)						
12.	SFT6301 Algorithm Design and Programming	Students develop algorithmic thinking and study basic programming constructs, data types, functions and problem decomposition. Structural algorithms,	6	LO2	–	EP6301, SFT6304, ANL6311, SFT6302, SFT6186, SFT6002, SFT6307, EGR6301

		debugging, testing and performance evaluation are explored through practical examples.				
13.	MAT6001 Algebra and Geometry	The course covers linear algebra and analytic geometry: matrices, systems of linear equations, vectors, spaces and geometric transformations. The methods are applied to formalising and solving practical problems in software development.	5	LO1	–	MAT6002, MAT6005, SFT6186
14.	NET6312 Computer Networks	Topics include network communication models, TCP/IP protocols, addressing, routing, local networks and diagnostic tools. Students gain basic skills in configuring connections, analysing traffic and assessing network infrastructure reliability.	4	LO3	–	SEC6301
15.	HRD6323 Robotic Systems Engineering	An introduction to robotic systems design, including actuators, sensors, controllers, control software logic and component integration. Students model robotic devices and perform introductory practical programming tasks.	4	LO3	–	–
16.	MAT6002 Mathematical Analysis	Students study limits, derivatives, integrals, multivariable functions and mathematical analysis methods. Emphasis is placed on interpreting calculations and applying analytical techniques to model algorithms and processes.	6	LO1	MAT6001	MAT6006
17.	EP6301 Training Practice	Training practice introduces the organisation of a developer's work, technical task formulation, collaborative tools, coding and results documentation. Students complete educational projects and report on their practical outcomes.	2	LO8, LO11	SFT6301	IP6302
18.	SFT6304 Python Programming	The course covers Python syntax, functions, collections, modules, exception and file handling, and elements of object-oriented programming. Students practise implementing algorithms, testing and automating repetitive operations in Python.	5	LO2	SFT6301	ANL6301
19.	ANL6311 Database Theory	Students study the relational model, normalisation, ER modelling, SQL, integrity constraints,	5	LO4	SFT6301	SFT6303, SFT6314

		queries and transaction processing. Practical exercises focus on building database schemas and integrating data stores with applications.				
20.	SFT6707 UI/UX Design	The course covers human-centred digital interface design, user needs research, information architecture, prototyping and a product's visual system. Students create mock-ups of user journeys with accessibility and usability in mind.	4	LO9, LO3	ICT6001	SFT6309
21.	MAT6005 Discrete Mathematics	Students study mathematical logic, sets, relations, graphs, combinatorics and Boolean functions. Formal proof methods and discrete models used in algorithms, data structures and software systems are examined.	4	LO1	MAT6001	–
22.	SFT6302 Algorithms and Data Structures	The course examines linear and nonlinear data structures, trees, hash tables, graphs, sorting, searching and recursion. Students study asymptotic complexity, choosing an algorithmic strategy and implementing efficient solutions.	5	LO2	SFT6301	SFT6319, SFT6325
23.	EGR6302 Information Theory	Students study models of information representation, transmission, encoding and compression, information measures and elements of communication-channel theory. The knowledge is applied to assessing information processes in digital systems.	5	LO1	–	–
24.	SFT6186 Artificial Intelligence	An introduction to AI methods: problem solving, knowledge representation, machine learning, core models and performance evaluation. Practical applications of intelligent software systems and responsible AI use are discussed.	5	LO7	SFT6301, MAT6001	–
25.	MAT6006 Probability Theory and Mathematical Statistics	The course examines random variables, distributions, probability models, parameter estimation and hypothesis testing. It provides a mathematical foundation for data analysis, modelling uncertainty and assessing the quality of software solutions.	4	LO1	MAT6002	ANL6301

26.	SFT6002 Object-Oriented Programming	Students study classes, objects, inheritance, encapsulation, polymorphism, interfaces, exceptions and component reuse. Practical work focuses on designing extensible applications and organising code according to object-oriented principles.	5	LO2	SFT6301	SFT6307, SFT6321, SFT6313, SFT6328, SFT6376, SFT6323
27.	SFT6307 Web Technologies	The course covers web architectures, HTTP, HTML, CSS, JavaScript, client–server interaction, web security fundamentals and deployment principles. Practical work involves creating and testing interactive web applications.	5	LO3, LO6	SFT6301, SFT6002	SFT6314, SFT6315, PM6301
28.	HRD6302 Architecture and Organization of Computer Systems	Students examine computer architecture, memory organisation, processors, input/output systems and program execution. The course builds a systematic understanding of computing platforms and their limitations for efficient software development.	5	LO3	ICT6001	–
29.	SFT6303 PL/SQL Programming	The course covers procedural SQL features, stored procedures, functions, packages, triggers, exceptions and transactions. Practical tasks involve developing server-side logic and improving the reliability of database operations.	5	LO4	ANL6311	–
30.	LAN6007K Records Management in the State Language	Students learn records management in the state language and the preparation of official letters, acts, minutes and reports. They develop the ability to prepare business documents in accordance with formal administrative style conventions.	3	LO10	–	–
31.	EGR6301 Operating Systems	The course covers processes, threads, memory management, file systems, scheduling, synchronisation and fundamental security in operating systems. Practical work includes system utilities and analysis of program behaviour.	5	LO3	SFT6301	SFT6325, SFT6315
32.	PP6305 Industrial Practice	Industrial practice involves participation in real software development, maintenance and testing projects. Students carry out assigned tasks, comply with workplace	4	LO8, LO11	IP6302	PP6304

		procedures and prepare the required reports.				
33.	RM6301 Fundamentals of Research	Students study research methods, problem formulation, literature review, hypothesis development, data analysis and presentation of research results. They prepare the research foundations for a Software Engineering graduation project.	5	LO11	SPS6001	PP6304
34.	ANL6301 Introduction to Data Science	The course explores stages of data work: collection, cleaning, exploratory analysis, visualisation and drawing conclusions. Students learn analytical tools, dataset preparation and quality assessment of analytical results.	6	LO7	MAT6006, SFT6304	–
35.	SFT6325 Parallel Programming	The course examines threads, processes, concurrent access, synchronisation, parallelisation of algorithms and parallel computing models. Practical work analyses performance and identifies data races, deadlocks and scaling issues.	6	LO7	SFT6302, EGR6301	–
36.	PM6301 Project Management	Students study the project lifecycle, scheduling, budgeting, role allocation, risk management and communications. Practical activities include preparing project plans and using agile or traditional approaches to IT project management.	4	LO8	SFT6307	–
37.	SEC6301 Fundamentals of Information Security	The course covers information security threats, access control models, cryptographic techniques, network attacks and secure development principles. Students learn to assess vulnerabilities and select protective measures for software systems.	5	LO5	NET6312	–
Cycle of Major Disciplines (MD)						
38.	LAN6003PA Professionally Oriented Foreign Language	Professional foreign-language skills are developed for communication in IT teams, reading specifications and discussing projects. Students prepare technical descriptions, presentations and messages using Software Engineering terminology.	4	LO10	LAN6002A	–
39.	IP6302 Industrial Practice	Industrial practice provides an opportunity to apply professional knowledge in an	4	LO8, LO11	EP6301	PP6305

		organisation. Students participate in developing, testing or maintaining software solutions, keep a practice diary and submit a report.				
40.	PP6304 Pre-Diploma Practice	Pre-diploma practice supports collection of materials, requirements analysis, architectural refinement and results needed for the graduation project. Students perform technical tasks in an organisation and systematise project documentation.	5	LO11	RM6301, PP6305	–
ELECTIVE COMPONENT (EC)						
Cycle of General Education Disciplines (GED)						
41.	LAW6007 Fundamentals of Law and Anti-Corruption Culture	Students study the fundamentals of Kazakhstani law, legal regulation of professional activity, intellectual property and anti-corruption culture. The course develops legal literacy, ethical responsibility and situational analysis skills.	5	LO10	–	–
42.	ECO6003 Fundamentals of Economic Theory	The course covers micro- and macroeconomic concepts, supply and demand, market mechanisms and economic behaviour. Students use economic indicators to evaluate technological and managerial decisions.	5	LO10	–	–
43.	HUM6400 Inclusive Education and Community Service	Students explore inclusion, accessibility, social responsibility and community service. They develop ethical communication, attention to diverse user needs and the ability to organise socially valuable initiatives.	5	LO10	–	–
44.	ECO6008 Fundamentals of Entrepreneurship and Financial Literacy	The course studies entrepreneurship, personal financial planning, business models, investment decisions and risk management. Emphasis is placed on financial literacy and commercialisation of technological ideas.	5	LO10	–	–
45.	ESG6001 Ecology, Sustainable Development and Fundamentals of Life Safety	The course covers sustainable development, environmental risks, life safety principles and organisational environmental responsibility. Practical approaches to sustainable resource use and assessing the environmental effects of digital technologies are examined.	5	LO10	–	–
Cycle of Major Disciplines (MD)						

46.	SFT6309 UX/UI Development	Students study UX research methods, user journeys, information architecture, interactive prototypes and UI components. Particular attention is paid to usability testing, accessibility and design systems for software products.	5	LO9, LO3	SFT6707	–
47.	SFT6311 Front-end Development	The course teaches client-side web technologies, component-based interface architecture, state management, routing, APIs and automated testing. Students produce an interactive application with a responsive interface.	5	LO3, LO6	–	–
48.	SFT6321 QA Testing	Students learn software quality assurance processes, test types, test design, test documentation and automated checks. Topics include defect reporting, test coverage assessment and integrating quality control into the development lifecycle.	5	LO5	SFT6002	–
49.	SFT6313 Mobile Technologies and Applications (Android)	The course covers Android application architecture, lifecycle components, user interfaces, local data and network services. Practical activities include building and testing a mobile application.	5	LO3, LO6	SFT6002	–
50.	SFT6328 iOS Mobile Application Development	Students study iOS development tools, mobile application architecture, screen design, data management and integration with network services. They develop and test an application for Apple's mobile ecosystem.	5	LO3, LO6	SFT6002	–
51.	SFT6319 Blockchain Technology	The course covers distributed ledgers, blockchain cryptography, consensus mechanisms, smart contracts and decentralised application models. Students assess the opportunities, constraints and risks of applying blockchain to digital services.	5	LO7	SFT6302	–
52.	SFT6314 Full Stack Development	Students study the server and client components of web applications, APIs, database interaction, authentication, testing and deployment. The practical outcome is a fully functional software product with integrated components.	5	LO3, LO6	SFT6307, ANL6311	–
5	SFT6376 Microsoft .NET	The course	5	LO3, LO6	SFT6002	–

3.	Framework – Application Development	covers .NET tools, object-oriented development, interface-based applications, data access, asynchronous operations and testing. Practical work focuses on building applied solutions within the Microsoft ecosystem.				
54.	SFT6315 DevOps	Students learn DevOps principles, version control, CI/CD, containerisation, configuration management, monitoring and deployment automation. They design a pipeline for building and delivering software.	6	LO6, LO5	EGR6301, SFT6307	–
55.	SFT6323 Programming on the Qt Platform	The course examines Qt architecture, events, signals and slots, widgets, data models and cross-platform builds. Practical work includes developing graphical applications and testing user interactions.	6	LO3, LO6	SFT6002	–
56.	MIN601 Minor – Course 1	Students select a Minor course to broaden professional competencies beyond their main specialisation. Its precise content and learning pathway are determined by the approved Minor catalogue. Project work develops the ability to integrate interdisciplinary approaches.	5	LO11	–	–
57.	MIN602 Minor – Course 2	Students select a Minor course to broaden professional competencies beyond their main specialisation. Its precise content and learning pathway are determined by the approved Minor catalogue. Project work develops the ability to integrate interdisciplinary approaches.	5	LO11	–	–
58.	MIN603 Minor – Course 3	Students select a Minor course to broaden professional competencies beyond their main specialisation. Its precise content and learning pathway are determined by the approved Minor catalogue. Project work develops the ability to integrate interdisciplinary approaches.	5	LO11	–	–

13. Curriculum

Semester 1			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	LAN6001A Foreign Language	5
GED	CC	ICT6001 Information and Communication Technologies	5
BD	UC	SFT6301 Algorithm Design and Programming	6
BD	UC	MAT6001 Algebra and Geometry	5
BD	UC	NET6312 Computer Networks	4
BD	UC	HRD6323 Robotic Systems Engineering	4
		TOTAL	**29**

Semester 2			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	LAN6002A Foreign Language	5
GED	CC	PhC6005 Physical Education	4
BD	UC	MAT6002 Mathematical Analysis	6
BD	UC	EP6301 Training Practice	2
BD	UC	SFT6304 Python Programming	5
BD	UC	ANL6311 Database Theory	5
BD	UC	SFT6707 UI/UX Design	4
		TOTAL	**31**

Semester 3			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	LAN6001KR Kazakh (Russian) Language	5
GED	CC	PhC6006 Physical Education	4
BD	UC	MAT6005 Discrete Mathematics	4
BD	UC	SFT6302 Algorithms and Data Structures	5
BD	UC	EGR6302 Information Theory	5
BD	UC	SFT6186 Artificial Intelligence	5
MD	UC	LAN6003PA Professionally Oriented Foreign Language	4
		TOTAL	**32**

Semester 4			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	HK6002 History of Kazakhstan	5
MD	UC	IP6302 Industrial Practice	4
GED	CC	SPS6001 Philosophy	5
GED	CC	LAN6002KR Kazakh (Russian) Language	5
BD	UC	MAT6006 Probability Theory and Mathematical Statistics	4
BD	UC	SFT6002 Object-Oriented Programming	5
		TOTAL	**28**

Semester 5			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	SPS6006 Cultural Studies–Psychology	4
BD	UC	SFT6307 Web Technologies	5
BD	UC	HRD6302 Architecture and Organization of Computer Systems	5
BD	UC	SFT6303 PL/SQL Programming	5
MD	EC	SFT6309 UX/UI Development / SFT6311 Front-end Development / SFT6321 QA Testing	5
MD	EC	MIN601 Minor – Course 1	5
		TOTAL	**29**

Semester 6			
Cyc.	Comp.	Course Code and Title	Cr.
GED	CC	SPS6007 Sociology–Political Science	4
BD	UC	LAN6007K Records Management in the State Language	3
BD	UC	EGR6301 Operating Systems	5
BD	UC	PP6305 Industrial Practice	4
GED	EC	LAW6007 Fundamentals of Law and Anti-Corruption Culture / ECO6003 Fundamentals of Economic Theory / HUM6400 Inclusive Education and Community Service / ECO6008 Fundamentals of Entrepreneurship and Financial Literacy / ESG6001 Ecology, Sustainable Development and Fundamentals of Life Safety	5
MD	EC	SFT6313 Mobile Technologies and Applications (Android) / SFT6328 iOS Mobile Application Development / SFT6319 Blockchain Technology	5
MD	EC	MIN602 Minor – Course 2	5
		TOTAL	**31**

Semester 7			
Cyc.	Comp.	Course Code and Title	Cr.
BD	UC	RM6301 Fundamentals of Research	5
BD	UC	ANL6301 Introduction to Data Science	6
BD	UC	SFT6325 Parallel Programming	6
MD	EC	SFT6314 Full Stack Development / SFT6376 Microsoft .NET Framework – Application Development	5
MD	EC	SFT6315 DevOps / SFT6323 Programming on the Qt Platform	6
MD	EC	MIN603 Minor – Course 3	5
		TOTAL	**33**

Semester 8			
Cyc.	Comp.	Course Code and Title	Cr.
BD	UC	PM6301 Project Management	4
BD	UC	SEC6301 Fundamentals of Information Security	5
MD	UC	PP6304 Pre-Diploma Practice	5
MD	EC	SFT6321 QA Testing / SFT6319 Blockchain Technology	5
FA	—	Preparation and Defence of the Thesis (Final Assessment)	8
		TOTAL	**27**