



INTERNATIONAL EUROPEAN UNIVERSITY

**EDUCATIONAL AND PROFESSIONAL PROGRAM:
INFORMATION SYSTEMS AND TECHNOLOGIES**

First (Bachelor) level

Specialty: 126 Information Systems and Technologies

Knowledge area: 12 Information Technology

Educational qualification: Bachelor of Information Systems and Technologies

APPROVED

**By the Decision of the Academic Council of
International European University**

dd. May 30, 2024, protocol No. 6

Chair of the Academic Council,

Oleh PADALKA

**Educational and professional program
becomes effective by the Order of the
Rector of International European
University**

dd. June 7, 2024, No. 41-OD

Kyiv 2024

INTRODUCTION

The Information Systems and Technologies educational and professional program of the first (Bachelor) level of higher education, specialty: 121 Software Engineering, is developed according to the Law of Ukraine On Higher Education dd. July 1, 2014, No. 1556-VII (as amended and supplemented), Resolutions of the Cabinet of Ministers of Ukraine: Approval of the National Qualifications Frameworks dd. November 23, 2011, No. 1341 (as amended by the Resolution of the Cabinet of Ministers of Ukraine dd. June 25, 2020, No. 519), About Approval of Licensing Conditions for Conducting Educational Activities dd. December 30, 2015, No. 1387 (as amended). The educational and professional program is based on the Higher Education Standard of Ukraine in the specialty: 126 Information Systems and Technologies, knowledge area: 12 Information Technology, of the first (Bachelor) level of higher education approved and put into effect by the Order of the Ministry of Education and Science of Ukraine No. 1380 dd. December 12, 2018. The educational and professional program stipulates the background for access to study, focus and key focus, the amount of ECTS credits required to gain a Bachelor's degree, the list of general and specialized (professional) competencies, the normative and variable content of student training specified in learning outcomes terms and requirements for higher education quality control.

The educational and professional program is developed by the working group of International European University, consisting of:

No.	Full name	Place of work, position
1	Oleksandr Falovskyi (guarantor of the educational program)	PhD in Technical Sciences, Associate Professor at the Department of Information Technology of International European University
2	Oleksandr Nesterenko	Doctor of Technical Sciences, Professor, Head of the Department of Information Technology of International European University
3	Zoia Sherman	PhD in Physics and Mathematics, Associate Professor, Associate Professor at the Department of Fundamental, Medical and Preventive Disciplines of International European University
4	Volodymyr Fedorov	PhD in Physics and Mathematics, Associate Professor at the Department of Information Technology of International European University

External stakeholders involved in the development of the educational program:

No.	Full name	Place of work, position
1	Valerii Polishchuk	The Ukrainian Scientific Centre for Development of Information Technology, Director
2	Viktor Shevchenko	Institute of Software Systems of the National Academy of Sciences of Ukraine, Deputy Director, Doctor of Technical Sciences, Professor
3	Volodymyr Fedorov	Fedorov Individual Entrepreneur, Director, PhD in Physics and Mathematics

Profile of the educational and professional program

1 – General information	
<i>Full name of the higher education institution and structural unit</i>	International European University Education and Research Institute “European Business School” Department of Information Technology
<i>Degree of higher education and qualification in the original language</i>	Bachelor of Information Systems and Technologies
<i>Official name of the educational program</i>	Information Systems and Technologies
<i>Type of diploma and capacity of the educational program</i>	Bachelor’s Degree Diploma, single, 240 ECTS credits, Period of study: 3 years and 10 months.
<i>Cycle/level</i>	NQF of Ukraine – 6 th level FQ-EHEA – first cycle EQF-LLL – 6 th level
<i>Background</i>	Complete general secondary education or a degree of Junior Bachelor, Professional Junior Bachelor (Junior Specialist). Based on the degree of Junior Bachelor (Junior Specialist), the higher education institution has the right to recognize and re-credit no more than 120 ECTS credits received as part of the previous educational program of Junior Bachelor (Junior Specialist) in specialties of the 12 Information Technology knowledge area and no more than 60 ECTS credits received as part of the previous educational program of Junior Bachelor (Junior Specialist) in other specialties; based on the degree of Professional Junior Bachelor, the higher education institution has the right to recognize and re-credit no more than 60 ECTS credits received as part of the previous educational program of professional pre-higher education. Admission based on the degrees of Junior Bachelor, Professional Junior Bachelor, or Junior Specialist is carried out according to the results of the external independent testing in the manner prescribed by law.
<i>Language(s) of instruction</i>	Ukrainian
<i>Validity of the educational program</i>	Until the next accreditation
<i>Internet address of constant placement of educational program description</i>	https://business.ieu.edu.ua/kafedry/kafedra-informatsiinykh-tekhnohii
2 – Goal of the educational program	
To train professionals based on the principles of creativity and academic integrity, who will be able to think critically, adopt innovations and integrate into the European community, who are proficient in programming, information system and technology development methods, who have general and professional competencies facilitating the competitiveness of graduates in the development, introduction, and investigation of information systems and technologies.	
3 – Characteristics of the educational program	
<i>Subject area (knowledge area,</i>	Knowledge area: 12 Information Technology Specialty: 126 Information Systems and Technologies

<p><i>specialty, specialization (if any))</i></p>	<p>The program is aimed at training specialists in information system and technology development able to produce high-quality information systems and IT products for various activity areas, in particular, in management.</p> <p>Learning objectives: to train specialists able to solve tasks and problems in the development, introduction, and maintenance of information systems and technologies, ensuring their quality, reliability, fault tolerance, and resilience using modern tools and industry innovations.</p> <p>Theoretical content of the subject area: basic mathematical, technological, linguistic, resource and economic conceptual principles of management and engineering related to the development, system integration, and maintenance of information systems and technologies.</p> <p>Methods, techniques and technologies: applied analysis and modeling methods, definition of information needs, data classification and analysis for information system and technology design; methods for developing information system and technology requirements; methods of information system and technology model analysis and construction; methods of integration and administration of information systems; methods of modifying information system components; models and methods of IT project management.</p> <p>Tools and equipment: software, hardware, instrumental, resource, and documentation tools for information system and technology development.</p>
<p><i>Focus of the educational program</i></p>	<p>Educational and professional program.</p> <p>The program is based on generally known scientific and practical research results in information system and technology development, taking into account its current state, and focused on relevant specializations for potential further professional and scientific career.</p> <p>The program has an applied focus on training specialists able to efficiently and reasonably solve problems of information system and technology design and development in management and managerial decision-making.</p>
<p><i>Key focus of the educational program and specialization</i></p>	<p>Special education and professional training in information systems and technologies, as well as IT products in management and decision-making.</p>
<p><i>Program features</i></p>	<p>The part of professional disciplines can be taught in English (bilingual education). The part of relevant professional topics can be taught by representatives of leading IT companies in the form of workshops or virtual internships.</p> <p>The program implies the integration of theoretical and practical training with the work of the University Digitalization Center where students produce application software and information technology on request of University units.</p>
<p>4 – Graduates’ ability to employment and further study</p>	
<p><i>Employability</i></p>	<p>Specialists can hold the following primary positions (according to the National Classifier of Ukraine DK 003:2010):</p> <ul style="list-style-type: none"> 312 Technical Specialists in Computing 3121 Programmer Technicians 3121.2 Information Technology Specialist 3121.2 Software Development and Testing Specialist 3121.2 Computer Program Development Specialist <p>Employment opportunities: Specialists at IT companies, IT Departments of small and large enterprises, technological and information institutes (researcher, data support, management support).</p>

<i>Further study</i>	A possibility to continue study at the second level of higher education (Master's program). Acquisition of additional qualifications in the postgraduate education system.
5 – Teaching and assessment	
<i>Teaching and learning</i>	Learning style: active, which allows students to choose the subject and organize their time. Lectures, laboratory works, seminars, practical classes in small groups, independent work based on textbooks and lecture notes, consultations with lecturers. The use of electronic means, such as the University e-learning platform. Within the past year, most of the time is devoted to a Bachelor's thesis presented and defended before the board of scientists.
<i>Assessment</i>	The student progress is assessed according to the national scale and the 100-point ECTS scale.
6 – Program competencies	
<i>Integral competence</i>	Ability to solve complicated specialized tasks and practical problems in the development of information systems and technologies characterized by complexity and uncertainty of conditions using theories and methods of information technology.
<i>General competencies (GC)</i>	<p>GC 1. Ability to abstract thinking, analysis and synthesis.</p> <p>GC 2. Ability to apply knowledge in practical situations.</p> <p>GC 3. Ability to talk in a state language both orally and in written form.</p> <p>GC 4. Ability to communicate in a foreign language both orally and in written form.</p> <p>GC 5. Ability to learn and acquire contemporary knowledge.</p> <p>GC 6. Ability to find, process and analyze information from different sources.</p> <p>GC 7. Ability to work in a team.</p> <p>GC 8. Ability to act based on ethical considerations.</p> <p>GC 9. Desire to preserve the environment.</p> <p>GC 10. Ability to act in a socially conscious manner.</p> <p>GC 11. Ability to exercise your rights and obligations as a member of society, realize values of civil (democratic) society and need for its steady growth, supremacy of law, rights and freedoms of individuals and citizens in Ukraine.</p> <p>GC 12. Ability to keep and multiply moral, cultural, scientific values and achievements of society based on the understanding of history and regularities of subject area development, its place in the general system of knowledge about nature and society and in the evolution of society, engineering and technologies, as well as to use different types and forms of physical activity for outdoor activities and a healthy lifestyle.</p>

<p><i>Specialized (professional) competencies (SC)</i></p>	<p>SC 1. The ability to analyze the subject area, identify, and classify the design object.</p> <p>SC 2. Ability to take part in information system design, including modeling (formal description) of their structure, behavior and operational processes.</p> <p>SC 3. Ability to develop architectures, components and modules of information systems.</p> <p>SC 4. Ability to formulate and ensure information system quality and reliability requirements in accordance with terms of reference and standards.</p> <p>SC 5. Ability to comply with specifications, standards, rules and guidelines in the professional sector when implementing information system life cycle processes.</p> <p>SC 6. Ability to analyze, select and apply methods and tools for information security (including cybersecurity) of information systems and technologies.</p> <p>SC 7. To know data information models, ability to develop technologies to store, mine, process, and analyze data in management.</p> <p>SC 8. Ability to apply fundamental and interdisciplinary knowledge to successfully solve problems related to the development of management information systems and technologies.</p> <p>SC 9. Ability to assess and consider economic, social, technological, and environmental factors affecting professional activities.</p> <p>SC 10. Ability to accumulate, process and systematize professional knowledge related to the creation, modification, and maintenance of information systems and technologies based on the lifelong learning paradigm.</p> <p>SC 11. Ability to implement phases and iterations of the life cycle of information systems and technologies based on appropriate models and international recommendations.</p> <p>SC 12. Ability to conduct the information system integration process, apply change management standards and procedures to maintain system integrity, overall functionality and reliability.</p> <p>SC 13. Ability to reasonably select and efficiently learn software and technological tools for the development of information systems.</p> <p>SC 14. Ability to analyze, synthesize, and optimize information systems and technologies using mathematical methods and models.</p>
<p>7 – Program learning outcomes (PLO)</p>	
	<p>PLO 1. To analyze, intentionally search for and select information and reference resources and knowledge required to solve professional problems, taking into account current scientific and technological achievements.</p> <p>PLO 2. To know the code of professional ethics, understand the social significance and cultural aspects of developing information systems and technologies, as well as observe them in professional activities.</p> <p>PLO 3. To know basic processes, phases and iterations of the information system life cycle.</p> <p>PLO 4. To know and apply professional standards, international recommendations, and other regulatory documents in the management information system development.</p>

	<p>PLO 5. To know and apply appropriate mathematical concepts, methods of domain, system and object-oriented analysis and mathematical modeling of information systems.</p> <p>PLO 6. Ability to select and use the appropriate software development methodology.</p> <p>PLO 7. To know and apply the fundamental concepts, paradigms and key operational principles of language, instrumental and computational information system and technology tools in practice.</p> <p>PLO 8. To be able to design and develop a human-machine interface.</p> <p>PLO 9. To know and be able to use methods and tools for systemic analysis of business architecture and its IT infrastructure, and to conduct the development and reengineering of their component base and structure.</p> <p>PLO 10. To conduct a pre-project examination of the subject area and the system analysis of the design object.</p> <p>PLO 11. To select design input data using formal methods of information system description.</p> <p>PLO 12. To apply the rules for preparing project documentation for information systems and technologies, and to understand the composition and sequence of project work in accordance with the requirements of relevant regulatory documents.</p> <p>PLO 13. To know and apply methods of algorithm design, data and knowledge structures.</p> <p>PLO 14. To apply instrumental software tools for information system analysis, design, and documentation in practice.</p> <p>PLO 15. To be motivated in selecting programming languages and development technologies to solve problems of creating and maintaining information systems and technologies.</p> <p>PLO 16. To have skills of team development.</p> <p>PLO 17. To be able to apply component-based information system software development techniques.</p> <p>PLO 18. To know and be able to use information technology to process, store and transmit data to maintain management and decision-making processes.</p> <p>PLO 19. To know approaches and be able to assess and ensure the quality of information system software.</p> <p>PLO 20. To know, analyze, select and skillfully apply information security (including cybersecurity) and data integrity tools according to the application tasks and software systems to be created.</p> <p>PLO 21. To be able to ensure the approval, preparation, and issuance of all types of technical documentation and to present the results of the information system development.</p> <p>PLO 22. To be able to develop the technical and economic justification for the development of information systems and technologies and to evaluate the economic effectiveness of their implementation.</p>
8 – Resource support of program implementation	
Staffing	<p>Guarantor: Oleksandr Falovskyi, PhD in Technical Sciences.</p> <p>The qualification of the academic staff engaged in the educational and professional program corresponds to the profile and area of the taught discipline. They have appropriate professional achievements. Professionals with research and/or professional experience, as well as</p>

	English-speaking lecturers, are involved in the organization of the educational process.
Material and technical support	The material and technical support of the Department of Information Technology at the Education and Research Institute “European Business School” has a sufficient classroom fund. Professional laboratory and practical works are performed in specialized classrooms of the Department of Information Technology: 1 computer lab per 15 workplaces fitted with two displays, server room, classroom for self-study of students. All rooms have Wi-Fi points.
Information, educational and methodical support	The University’s virtual training environment (based on Dspace and Moodle software) includes digitized library collections of the educational electronic library and author’s distance learning courses developed by lecturers of the Department of Information Technology. Besides, one applies cloud technology elements from Google Cloud resources and Google Classroom technologies. Official website of the Department of Information Technology containing key information about the educational program and educational and methodical support.
9 – Academic mobility	
National credit mobility	Based on bilateral cooperation agreements between IEU and Ukrainian higher education institutions.
International credit mobility	Based on bilateral cooperation agreements with the world’s leading IT companies and universities.
Training of foreign students	Training of foreign students is provided in case of undertaking additional language training.

2. LIST OF COMPONENTS OF THE EDUCATIONAL AND PROFESSIONAL PROGRAM AND THEIR LOGICAL SEQUENCE

2.1. List of EP components

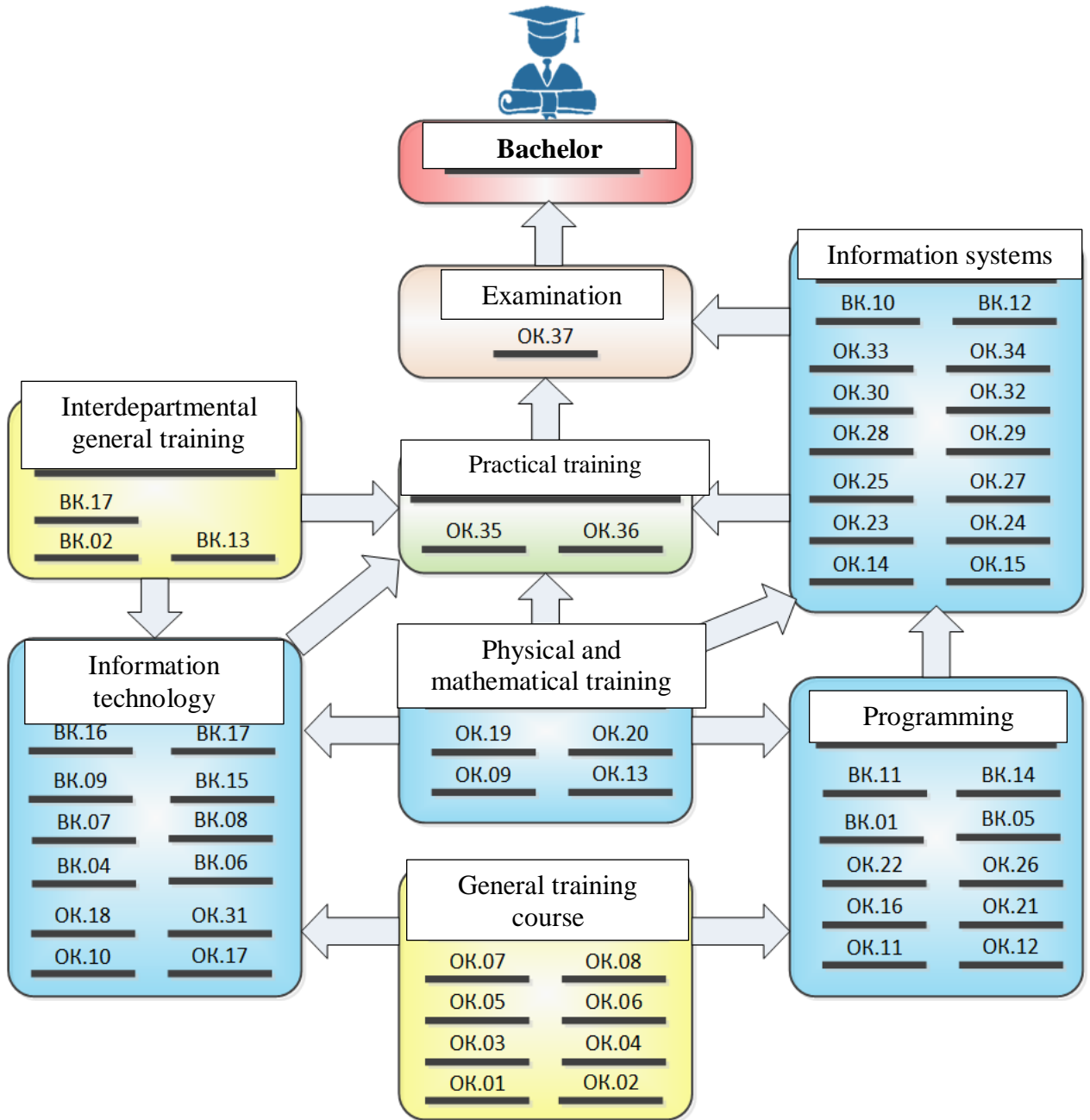
Discipline code	Components of the educational program (academic disciplines, term papers, practical training, qualifying paper)	Number of credits	Form of final control
1	2	3	4
1. Obligatory components			
<i>General training course</i>			
OC1	History of Ukrainian Statehood and Culture	4	exam
OC2	Academic Integrity and Basics of Scientific Research	4	exam
OC3	Ukrainian (Professional)	4	exam
OC4	Health and Safety, Labor Protection and Civil Defense	3	Pass/Fail test
OC5	Foreign Language (Professional)	21	Pass/Fail test, exam
OC6	Philosophy, Ethics and Aesthetics	3	Pass/Fail test
OC7	Law	4	Pass/Fail test
OC8	Digital Technologies for Learning and Professional Activities	4	exam
<i>Professional training course</i>			
OC9	Higher and Applied Mathematics	8	Pass/Fail test, exam
OC10	Methods and Tools of Computer Information Technology	4	Pass/Fail test
OC11	Fundamentals of Programming	8	Pass/Fail test, exam
OC12	Data Algorithms and Structures	4	exam
OC13	Computer-Based Discrete Mathematics	4	exam
OC14	Fundamentals of Software Engineering	4	Pass/Fail test
OC15	Group Dynamics and Communications	3	Pass/Fail test
OC16	Object-Oriented Programming	8	Pass/Fail test, exam
OC17	Organization of Databases and Knowledge Bases	8	Pass/Fail test, exam, term paper
OC18	Computer Networking Organization	4	exam
OC19	Probability Theory and Mathematical Statistics	4	exam
OC20	Physics (Selected Sections)	4	exam
OC21	Human-Machine Interaction	4	Pass/Fail test
OC22	Operating Systems	4	exam
OC23	Distributed Information Systems and Cloud Technologies	5	exam
OC24	Computer Architecture	3	exam
OC25	Modeling of Information Systems	5	exam
OC26	Web Application Programming	3	Pass/Fail test
OC27	Decision Theory	4	Pass/Fail test
OC28	System Analysis	4	exam
OC29	IT Project Management	3	exam

OC30	Architecture and Design of Information Systems	5	exam, term paper
OC31	Software and Data Security	5	exam
OC32	Data Analysis and Business Intelligence Technologies	4	exam
OC33	Economics and Documentation of Information Systems	3	exam
OC34	Methods and Tools for Intelligent Information Systems and Technologies	4	exam
<i>Practical training</i>			
OC35	On-the-Job Training	4	Pass/Fail test
OC36	Pre-Graduation Practical Training	4	Pass/Fail test
Student examination			
OC37	Qualifying paper	6	defense
Total number of obligatory components:		180	
Total number of elective components:		60	
TOTAL CAPACITY OF THE EDUCATIONAL PROGRAM		240	

2.2. Structural and logical scheme of the allocation of educational components by semesters

	General training course	Professional training course	Practical training	Examination
8 th semester		BK.17 BK.16 BK.15 BK.14 BK.13 OK.34 OK.33		OK.37
7 th semester	OK.5	BK.12 BK.11 BK.10 BK.09 OK.32 OK.31	OK.36	
6 th semester	OK.5	BK.08 BK.07 BK.06 OK.30 OK.29 OK.28	OK.35	
5 th semester	OK.5	OK.27 OK.26 OK.25 OK.24 OK.23 BK.05 BK.04		
4 th semester	OK.5	OK.22 OK.21 OK.17 OK.16 BK.03 BK.02 BK.01		
3 rd semester	OK.5	OK.20 OK.19 OK.18 OK.17 OK.16 OK.15 OK.12		
2 nd semester	OK.7 OK.6 OK.5	OK.14 OK.13 OK.11 OK.10 OK.09		
1 st semester	OK.8 OK.5 OK.4 OK.3 OK.2 OK.1	OK.11 OK.09		

2.2. Structural and logical scheme of the educational program



3. FORM OF STUDENT EXAMINATION

Forms of student examination	The examination of graduates of the Information Systems and Technologies educational and professional program in 126 Information Systems and Technologies specialty is conducted in the form of public defense of the <u>qualifying paper</u> .
Qualifying paper requirements (if any)	<p>A qualifying paper should solve a specialized task or practical application problem in software engineering characterized by complexity of conditions using theories and methods of information technology.</p> <p>The qualifying paper should not contain academic plagiarism, falsification and copying.</p> <p>The qualifying paper should be published on the official website of International European University or on the website of the European Business School.</p> <p>The publication of qualifying papers containing restricted access information should be carried out in accordance with the current legislation.</p>

4. REQUIREMENTS FOR THE SYSTEM OF INTERNAL HIGHER EDUCATION QUALITY ASSURANCE

International European University has the system of internal higher education quality assurance (internal quality assurance system) that includes the following procedures and measures:

- definition of principles and procedures of higher education quality assurance;
- monitoring and periodical review of educational programs;
- annual assessment of students, academic and teaching staff of the University and regular announcement of the assessment results on the official website of the University, information stands or in any other way;
- advanced training of the teaching, scientific and academic staff;
- availability of resources required to organize the educational process, including independent work of students in each educational program;
- availability of information systems for efficient management of the educational process;
- publicity of information about educational programs, higher education degrees and qualifications;
- compliance with academic integrity among the University personnel and students, including creation and functioning of the efficient system for preventing and detecting academic plagiarism;
- other procedures and measures.

The system of internal higher education quality assurance (internal quality assurance system) is assessed as requested by the University by the National Agency for Higher Education Quality Assurance (NAQA) or independent institutions of higher education quality assessment and assurance accredited by NAQA for its compliance with the requirements of the higher education quality assurance system approved by NAQA, international standards and recommendations for higher education quality assurance.

Educational components of the program	Program competencies																									
	GC 01	GC 02	GC 03	GC 04	GC 05	GC 06	GC 07	GC 08	GC 09	GC 10	GC 11	GC 12	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12	SC 13	SC 14
OC21	*													*									*			*
OC22														*				*						*	*	
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OC35		*			*	*	*							*	*					*	*					
OC36		*			*	*	*							*	*			*		*	*		*		*	
OC37		*	*											*	*			*		*	*		*		*	

Matrix of providing program learning outcomes (PLO) with relevant components of the educational program

Components of the educational program (discipline), practical training, individual tasks	PLO 01	PLO 02	PLO 03	PLO 04	PLO 05	PLO 06	PLO 07	PLO 08	PLO 09	PLO 10	PLO 11	PLO 12	PLO 13	PLO 14	PLO 15	PLO 16	PLO 17	PLO 18	PLO 19	PLO 20	PLO 21	PLO 22	
OC1	*																						
OC2	*	*																					
OC3																*							
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OC22					*								*						*				

Components of the educational program (discipline), practical training, individual tasks	PLO 01	PLO 02	PLO 03	PLO 04	PLO 05	PLO 06	PLO 07	PLO 08	PLO 09	PLO 10	PLO 11	PLO 12	PLO 13	PLO 14	PLO 15	PLO 16	PLO 17	PLO 18	PLO 19	PLO 20	PLO 21	PLO 22
OC23																		*			*	
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OC26							*	*							*							
OC27	*	*							*	*												
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OC36		*				*						*	*	*	*							
OC37												*	*	*	*					*		