

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
TRANSCARPATHIAN HUNGARIAN UNIVERSITY
NAMED AFTER FERENC RÁKÓCZI II**

**APPROVED BY THE
ACADEMIC COUNCIL**

Transcarpathian Hungarian Institute
named after Ferenc Rákóczi II,
Minutes No. 5 dated 24.05.2023

With changes and additions,
approved by the Academic Council,
Minutes No. 3 dated 24.04.2025
Minutes No. 62 dated 28.05.2026

Enacted by order of the rector
№..... from 2026 year

Chairman of the Academic Council
_____ Chernichko S.S.

EDUCATIONAL AND SCIENTIFIC PROGRAM

«Biology and Biochemistry»

LEVEL OF HIGHER EDUCATION	Second (master's)
HIGHER EDUCATION DEGREE	Master's
FIELD OF KNOWLEDGE	E Natural Sciences, Mathematics and Statistics
SPECIALTY	E1 Biology and Biochemistry
QUALIFICATION	Master of Science in Biology and Biochemistry

Beregovo – 2026

LETTER OF APPROVAL
Educational and Scientific Program
"Biology and Biochemistry"

1. Guarantor of the educational program:

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3. Head of the Department of Biology and Chemistry _____ Erzsébet KOHUT
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4. Head of the Department of Student Contingent _____ Zsuzsanna FIZESZY
_____ 2026 year

5. Head of the Department of Quality Assurance of Higher Education _____ Adalbert RAC
_____ 2026 year

6. Vice-Rector for Educational and Methodological Work _____ Alexander
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7. Vice-Rector for Research and Quality of Education _____ Imre SAKAL
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PREAMBLE

The Educational and Scientific Program (ESP) "Biology and Biochemistry" for the training of applicants for higher education at the second (master's) level of higher education in the specialty **E1 Biology and Biochemistry** contains the amount of ECTS credits required to obtain the appropriate degree of higher education; the list of competencies of the graduate; the normative content of the training of higher education applicants, formulated in terms of learning outcomes; forms of certification of higher education applicants; requirements for the availability of the system internal quality assurance of higher education.

The educational and scientific program "Biology and Biochemistry" was developed by the project group of the Department of Biology and Chemistry consisting of:

1. **SIKURA ANITA YOSYPIVNA**, guarantor of the educational program, Candidate of Biological Sciences, Professor, Professor of the Department of Biology and Chemistry of the Transcarpathian Hungarian University named after Ferenc Rákóczi II, head of the project group.
1. **PROTOPOPOVA VIRA VIKTOROVNA**, Doctor of Biological Sciences, Professor of the Department of Biology and Chemistry of the Transcarpathian Hungarian University named after Ferenc Rákóczi II.
1. **KOHUT ERZSÉBET IMRIIVNA**, Head of the Department of Biology and Chemistry, Doctor of Philosophy (PhD) in Biology, Associate Professor, Associate Professor of the Department of Biology and Chemistry, Ferenc Rákóczi II Transcarpathian Hungarian University.
1. **ANDRIK EVA JOZHEFIVNA**, Candidate of Biological Sciences, Associate Professor, Associate Professor of the Department of Biology and Chemistry of the Transcarpathian Hungarian University named after Ferenc Rákóczi II.
1. **BIROV RENATA**, A student of the second (master's) level of higher education at the Department of Biology and Chemistry of the Transcarpathian Hungarian University named after Ferenc Rákóczi II.

External stakeholders involved:

1. **MEKHED OLHA BORYSIVNA**, Doctor of Biological Sciences, Professor, Head of the Department of Biology, Taras Shevchenko National University "Chernihiv Collegium"
2. **MATIHA OLHA OMELIANIVNA**, Candidate of Agricultural Sciences, Acting Director of the Transcarpathian State Agricultural Experimental Station of the National Academy of Agrarian Sciences of Ukraine.
3. **VOLOSHCHUK MYKOLA IVANOVYCH**, Candidate of Biological Sciences, Head of the Botanical Laboratory of the Carpathian Biosphere Reserve.

Guarantor of the educational program

A.Y. Sikura

GENERAL INFORMATION

The Educational and Scientific Program (ONP) is developed in accordance with the Laws of Ukraine «[Про освіту](#)», «[Про вищу освіту](#)» (<https://zakon.rada.gov.ua/laws/show/1556-18#Text>), Resolution of the Cabinet of Ministers of Ukraine of 23.11.2011, No 1341 (as amended by the Resolution of the Cabinet of Ministers of Ukraine of 25.06.2020, No 519) «[Про затвердження Національної рамки кваліфікацій](#)», relies on regulatory documents that determine the development of components of the system of higher education standards and regulate the conduct of educational activities in higher education institutions of Ukraine, on the basis of the "Methodological recommendations for the development of higher education standards" (Order of the Ministry of Education and Science of Ukraine dated 27.03.2025, No. 512; <https://mon.gov.ua/static-objects/mon/sites/1/vishcha-osvita/2025/03/27/nakaz-mon-512-vid-27-03-2025.pdf>) and Regulations on the Preparation and Updating of Educational Programs at Rákóczi University (<https://kme.org.ua/uk/mik/#dod-2-i-10-pol-sklad-onovl-osv-prohr>); Order of the Ministry of Economic Development, Trade and Agriculture of 23.03.2021 No. 610 on approval of the professional standard for a group of professions «[Викладачі закладів вищої освіти](#)». Order of the Ministry of Education and Science of Ukraine dated October 16, 2024 No. 1466 «[Про затвердження професійного стандарту «Викладач закладу вищої освіти»](#)». The standard of the relevant specialty of List 1 was taken into account according to the table of correspondence in accordance with the Order of the Ministry of Education and Science of Ukraine dated 19.11.2024 No. 1625. Resolution of the Cabinet of Ministers of Ukraine No. 266 of April 29, 2015 «[Про затвердження переліку галузей знань і спеціальностей, за якими здійснюється підготовка здобувачів вищої освіти](#)» (as amended by the Resolutions of the Cabinet of Ministers No. 188 of 21.02.2025).

To determine the professional types of work of graduates of the second (master's) level of higher education in the specialty E1 Biology and Biochemistry, national classifiers were used ([Класифікатор видів економічної діяльності за КВЕД-2010](#), [Класифікатор професій ДК 003:2010](#), Appendix to the Resolution of the Cabinet of Ministers of Ukraine No. 1341 of November 23, 2011 as amended by the Resolution of the Cabinet of Ministers of Ukraine [№ 509 від 12.06.2019](#), [№ 519 від 25.06.2020](#)}).

During the development of the ONP, in particular in determining general and special (professional) competencies and program learning outcomes, the achievements of the European Union project were used «[Tuning Educational Structures in Europe](#)» та [Стандарти і рекомендації щодо забезпечення якості в Європейському просторі вищої освіти \(ESG\)](#). The ONP "Biology and Biochemistry" was developed by the support group of the Department of Biology and Chemistry of the higher education institution "Transcarpathian Hungarian University named after Ferenc Rákóczi II".

Scientific, pedagogical, scientific and pedagogical staff of the Department of Biology and Chemistry, who provide the educational process in the specified specialty, as well as external stakeholders, are involved in the development of the ONP.

The educational and scientific program takes into account the requirements of the Law of Ukraine "On Higher Education", the professional standard for the group of professions "Teachers of higher education institutions", the Order of the Ministry of Education and Science of Ukraine dated October 16, 2024 No. 1466 «[Про затвердження професійного стандарту «Викладач закладу вищої освіти»](#)», of the National Qualifications Framework and establishes:

1. terms of study and the amount of ECTS credits required to obtain the second (master's) level of higher education;
2. the normative content of the training of higher education applicants, formulated in terms of learning outcomes;
3. competencies of a graduate of the relevant degree of higher education (integral, general and special);
4. list of educational components, their logical sequence;
5. forms of attestation of higher education applicants;
6. academic rights of graduates;
7. suitability of graduates of the relevant degree of higher education for employment and further education;
8. requirements for the existence of an internal quality assurance system for higher education.

The educational program *is used during*:

1. accreditation of the educational program and inspection of educational activities in the specialty;
2. development of the curriculum, syllabuses of academic disciplines and practice programs;
3. development of diagnostic tools for current, semester control and final certification;
4. professional orientation of applicants for the specialty;
5. certification of undergraduates in the specialty **E1 Biology and Biochemistry**.

Users of the educational program:

1. Admission Committee of the Transcarpathian Hungarian University named after Ferenc Rákóczi II, applicants;
2. scientific and pedagogical staff of the Transcarpathian Hungarian University named after Ferenc Rákóczi II, who train masters in the specialty **E1 Biology and Biochemistry**;
3. applicants for higher education studying at the Transcarpathian Hungarian University named after Ferenc Rákóczi II;
4. Attestation commission.

PROFILE OF THE EDUCATIONAL PROGRAM

1-General information	
Full name of the higher education institution and structural unit	Transcarpathian Hungarian University named after Ferenc Rákóczi II Department of Biology and Chemistry
Higher education level	Second (master's) level
Higher education degree	Master's Degree
Official name of the educational program	Біологія та біохімія Biology and biochemistry Biológia és biokémia
Field of Knowledge	Е Природничі науки, математика та статистика Natural sciences, mathematics and statistics Természettudományok, matematika és statisztika
Specialty	E1 Біологія та біохімія Biology and biochemistry Biológia és biokémia
Field of education by International Standard for the Classification of Education ISCED-F 2013 and justification	Broad field: 05 Natural Sciences, Mathematics and Statistics Narrow field: 051 Biological and related sciences Detailed field: 0511 Biology and 0512 Biochemistry Classification and positioning of the educational program: The educational program is assigned to the relevant specialty and field of knowledge according to the List of Fields of Knowledge and Specialties (Resolution of the Cabinet of Ministers of Ukraine No. 266 as amended No. 1021 dated 30.08.2024). In order to ensure international comparability, transparency and correct identification of the content of education, the educational program is correlated with the detailed branch of the International Standard Classification of Education ISCED-F 2013 in accordance with the Methodological Recommendations approved by the Order of the Ministry of Education and Science of Ukraine dated 31.12.2025 No. 1734. The compliance of the educational program is determined according to the principle of dominant content, taking into account the purpose of the educational program, program learning outcomes and the expected professional activity of graduates. Code ISCED-F 2013: 0511 (Biology). <i>M10) Biology and Biochemistry (ONP) — 0511 (Biology)</i> ONP is dominant in the natural sciences with a focus on biological systems, biological processes and modern research methods; The components of biochemistry act as an instrumental and deepening block within the framework of biological preparation. According to the principle of dominant content (Order of the Ministry of Education and Science No. 1734), the program is classified as 0511

	(Biology) , since it most fully reflects the main theoretical and research profile of the ONP.
Educational qualification	Master of Science in Biology and Biochemistry
Type of diploma and scope of educational program	Master's degree, single, 120 ECTS credits; Duration of study 1 year 10 months
Forms of training	Institutional (full-time, part-time, remote)
Qualifications in the diploma	Field of knowledge - E Natural sciences, Mathematics and statistics Specialty – E1 Biology and Biochemistry Educational program – "Biology and Biochemistry"
Cycle/Level	National Qualifications Framework of Ukraine - level 7; FQ-EHEA – Other Cycle , EQF - LLL - Level 7
Prerequisites	Bachelor's, Specialist's, Master's degree In the case of admission on the basis of previous education obtained in another specialty, the University forms an individual educational trajectory of the applicant, in particular, establishes requirements for the elimination of academic differences.
Language(s) of instruction and assessment	In Ukrainian, Hungarian, English
Availability of accreditation	Certificate of conditional (deferred) accreditation No. 16344 dated 24.06.2025, the certificate is valid on 24.06.2026 in accordance with the decision of the Accreditation Commission on 24.06.2025, protocol No. 137. Order of the Ministry of Education and Science of Ukraine of 09.07.2019, No 944 Another accreditation in 2027
Validity of the educational program	Until the next accreditation
Internet address of permanent posting of the description of the educational program	https://kmf.uz.ua/uk/strukturni-pidrozdily/kafedri/kafedra-biologii/

2 - Purpose of the educational program

The purpose of the educational and scientific program is to provide fundamental theoretical and practical training of competitive specialists in biology and biochemistry and scientific and pedagogical personnel to acquire the ability to perform professional, scientific tasks and responsibilities in the field of modern biology and provide for the application of laws, theories and methods of natural sciences.

3 - Characteristics of the educational program

Subject area (field of knowledge, specialty)	Field of Knowledge – E Natural Sciences, Mathematics and Statistics Specialty – E1 Biology and Biochemistry <i>Object of study:</i> structure, functions and processes of vital activity of biological systems of different levels of organization, biodiversity and evolution of living systems, their interaction with the environment, reactions under different conditions of existence; the importance of living beings in the biosphere, national economy, health care. <i>Learning objectives:</i> training of specialists capable of solving complex specialized problems and practical problems in the field of biology and biochemistry or in the learning process, characterized by complexity and uncertainty of conditions and involving the application of laws, theories and methods of natural sciences. <i>Theoretical content of the subject area:</i> structure, functions and processes of life, systematics, methods of research of non-cellular life forms, prokaryotes and eukaryotes. Structural and functional characteristics of biological systems at different levels of organization. Forms of relationships between micro- and macroorganisms. Evolutionary ideas of the organic world. Concepts, concepts, principles, laws of modern biological science and their use to assess the state of biological systems of different levels of organization, presentation and use of the results of biological and biochemical research. <i>Methods, techniques and technologies:</i> methods of laboratory and field biological research, monitoring, mathematical and statistical processing of experimental data and interpretation of biological research results, information and communication technologies, methods of empirical research and modeling of processes and phenomena of biological systems of various levels of organization <i>Tools and equipment:</i> living objects, biological models, modern instruments and equipment for laboratory, desk and field biological research, specialized software and computer tools.
Orientation of the educational Applications	Educational and scientific program. ONP Biology and Biochemistry is focused on the professional training of future biologists and biochemists, and is provided by the teaching of fundamental and applied disciplines according to the curriculum. The educational program has an academic, applied orientation.
The main focus of the educational program and specialization	The educational and scientific program for the preparation of masters in the field of E Natural Sciences, Mathematics and Statistics in the specialty E1 Biology and Biochemistry is aimed at the formation of professionals with deep knowledge and practical skills in various fields of biological science, able to

	independently and effectively solve complex problems and form their own ways and means of achieving professional goals. Keywords: higher education, biology, biodiversity, ecology, applied botany, biological systems of different levels of organization, biotechnology, biochemistry, botany, flora and vegetation, zoology, hydrobiology, nanobiology, applied research methods.
Features of the program	The program is focused on the in-depth study of the biology of organisms and supra-organismal systems, taking into account the regional aspect of the study of protection, conservation, rational use, biodiversity of natural terrestrial and water resources. The content component of the ONP is formed taking into account the needs of the labor market, scientific-practical and assistant (pedagogical) training ensures the formation of specialists who are competitive in the domestic and international labor market. The program is carried out in small groups in an active educational environment with an emphasis on practical training and leading European and world experience in the field of biological sciences, with wide access to employment. As part of the educational program, English or other official languages of the European Union may be used in the teaching of some disciplines.
The amount of ECTS credits required to obtain the appropriate higher education degree	Based on the qualification of a bachelor (specialist), is 120 ECTS credits. Rákóczi University in accordance with the "Regulations on the Procedure for Re-Enrollment of Academic Disciplines, Determination and Elimination of Academic Differences» (https://kme.org.ua/uk/mik/#dod-2-i-14-pol-perezar-navch-discipl) (recognizes and re-credits ECTS credits and learning outcomes of educational components obtained under another OP at an institute or in another higher education institution.
4 - Graduates' suitability for employment and further education	
Suitability for Employment	A specialist is able to perform professional work (defined in the National Qualifications Framework and the National Classifier of Ukraine – DK 003:2010) and can hold the following positions: 2211 Biologists, botanists, zoologists, and related occupation professionals 2211.1 Research Associates (Biology, Botany, Zoology, etc.) 2211.2 Biologists, botanists, zoologists and professionals in related professions 2310.2 Teacher of a higher education institution 2310 .2 Assistant
Academic rights of graduates	Opportunity to study at the next, third (educational and scientific) level of higher education, PhD level (Doctor of Philosophy) in related fields of scientific knowledge. Acquisition of modern qualifications in the system of postgraduate education.

5 - Teaching and Assessment	
Teaching and learning	Teaching, learning and assessment is based on the defined provisions of the Concept of Quality Assurance of Education (https://kme.org.ua/uk/mik/#dod-1, https://kme.org.ua/uk/mik/#dod-2-i-osv-proc, https://kme.org.ua/uk/mik/#dod-2-i-1-pol-orh-osv-proc, https://kme.org.ua/uk/mik/#dod-2-i-2-pol-sys-vnutr-zabezp). Student-centered, problem-oriented learning with elements of creative implementation of tasks; self-study, self-assessment. The competence approach is the focus of the educational process on achieving integral results in learning. Teaching involves lectures, seminars and practical classes, individual tasks and independent work with the possibility of consultations with the teachers of the department, preparation of final qualification (master's) works. Interactive, project, information and computer, self-developing, collective and integrative learning technologies are widely used. preparation. The final certification takes place in the form of a master's thesis defense and a comprehensive qualification exam.
Assessment	Control and assessment of the quality of knowledge acquisition, acquisition of practical skills and formation of professional competencies of undergraduates is based on systematic monitoring of their educational achievements (https://kme.org.ua/uk/mik/), which <i>includes</i>: - use of a cumulative system aimed at mastering the educational load of the educational program and provides for the assessment of higher education applicants for all types of classroom and extracurricular educational activities in accordance with the types of control of the training curriculum; - current and modular control; - defense of projects, presentations, abstracts and reports on practices; - tests; - oral and written semester exams; - final certification in the form of defense of a master's thesis and a comprehensive qualification exam. Assessment of students' academic achievements is carried out according to the ECTS scale ("excellent" – 90-100/A; "good" – 82-89/B, 75-81/C; "satisfactory" – 64-74/D, 60-63/E; "unsatisfactory with the possibility of reassembly" – 35-59/FX; "unsatisfactory with the obligatory re-study of the discipline" – 0-34/F) and verbal ("enrolled", "not enrolled").
6 - Program competencies (Table 1)	
Integral Competence	The ability to solve complex tasks and problems in the field of biology in the implementation of professional activities or in the process of learning, which involves research and/or innovation, and is characterized by uncertainty of conditions and requirements.
General Competencies (GC)	GC 01. Ability to work in an international context.

	GC 02. Ability to use information and communication technologies, ability to practically apply the acquired knowledge, skills and abilities, ability to possess critical thinking skills, prevention of the spread of false information. GC 03. Ability to generate new ideas (creativity). GC 04. Ability to act on the basis of ethical considerations (motives). GC 05. Ability to develop and manage projects. GC 06. Ability to conduct research at the appropriate level. GC 07. Ability and readiness to communicate in the field of professional activity, ability to motivate and persuade, ability to avoid and resolve conflicts; GC 08. Ability to work in a team, participate in the life of society, local self-government bodies and in management at various levels, including in volunteer activities. GC 09. Ability to exercise one's rights and duties as a member of society; to realize the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, human rights and freedoms GC 10. Demonstrate understanding of the requirements for professional activity due to the need to ensure sustainable development of Ukraine, its strengthening as a democratic, social, legal state
Special (professional, subject) competencies Specialties (SC)	SC 01. Ability to use the latest achievements in biology necessary for professional, research and/or innovative activities. SC 02. Ability to formulate modeling problems, create models of objects and processes on the example of different levels of organization of living things using mathematical methods and information technologies. SC 03. Ability to use modern information technologies and analyze information in the field of biology and at the border of subject areas. SC 04. Ability to analyze and generalize the results of research at different levels of organization of living, biological phenomena and processes. SC 05. Ability to plan and perform experimental work using modern methods and equipment. SC 06. The ability to predict the directions of development of modern biology based on a general analysis of the development of science and technology. SC 07. The ability to diagnose the state of biological systems based on the results of the study of organisms at different levels of organization. SC 08. Ability to present and discuss the results of scientific and applied research, prepare scientific publications, participate in scientific conferences and other events. SC 09. Ability to apply copyright law for the needs of practical activities; to adhere to ethical principles and rules defined by law when teaching and conducting scientific (creative)

	activities in order to ensure confidence in the results of learning and/or scientific (creative) achievements; ability to behave honestly in the academic environment. SC 10. Understanding of the goals, objectives, methods and approaches of scientific and pedagogical activities. SC 11. Ability to plan, conduct training sessions and advise HE applicants. SC 12. Ability to evaluate learning outcomes and provide feedback to applicants for higher education based on these results. SC 13. Ability to understand the essence of the relationship between the natural environment and man, to understand and explain the strategy of sustainable development of mankind
7 – Program learning outcomes (Table 2)	
Program Learning Outcomes (PLO)	PLO 1. Speak state and foreign languages at a level sufficient to communicate on professional issues and present the results of their own research. PLO 2. Use libraries, information databases, Internet resources to search for the necessary information. PLO 3. To carry out coordinated work for the result in the team, taking into account social, state and industrial interests. PLO 4. Solve complex problems in the field of biology, generate and evaluate ideas. PLO 5. To analyze and evaluate the impact of the achievements of biology on the development of society. PLO 6. Analyze biological phenomena and processes at the molecular, biochemical, cellular, organismal, population-species and biosphere levels from the point of view of fundamental general scientific knowledge, as well as use special modern research methods. PLO 7. Describe and analyze the principles of structural and functional organization, mechanisms of regulation and adaptation of organisms to the influence of various factors. PLO 8. To apply during research knowledge of the peculiarities of the development of modern biological science, the basic methodological principles of scientific research, methodological and methodological tools for conducting scientific research in specialization. PLO 9. Plan scientific research, choose effective research methods and their material support. PLO 10. Present the results of scientific work in writing (in the form of a report, scientific publications, etc.) and orally (in the form of reports and report defense) using modern technologies, argue and defend their position in scientific discussion. PLO 11. To carry out statistical processing, analysis and generalization of the obtained experimental data using software tools and modern information technologies. PLO 12. To use innovative approaches to solve complex problems of biology under uncertain conditions and requirements.

	PLO 13. Comply with the basic rules of biological ethics, biosafety, biosecurity, assess the risks of using the latest biological, biotechnological and biomedical methods and technologies, identify potentially dangerous organisms or production processes that may pose a threat of emergencies. PLO 14. To comply with the norms of academic integrity during study and scientific activities, to know the basic legal norms for the protection of intellectual property. PLO 15. Apply modern teaching technologies for teaching special disciplines. PLO 16. To model objects and processes in living organisms and their components using mathematical methods and information technologies. PLO 17. To develop and improve educational and methodological materials and to supervise the practical training of higher education applicants. PLO 18. Determine their role and tasks in the implementation of professional and other activities and strive for continuous personal professional development.
8 - Resource support for the implementation of the program	
Staffing	The quality of scientific and pedagogical staff who train masters of the educational and scientific program "Biology and Biochemistry" meets the licensing conditions. All scientific and pedagogical workers systematically undergo advanced training in domestic and foreign higher educational institutions and research institutes. Academic integrity is ensured by the employees of the higher education institution and students, including the creation and operation of an effective system for the prevention and detection of academic plagiarism (the StrikePlagiarism system is used). A system for ensuring the quality of educational activities and the quality of higher education has been developed and is being applied (the system of internal quality assurance of education in the UR; https://kme.org.ua/uk/mik/#dod-1). The personnel selection system is carried out on a competitive basis (https://kme.org.ua/uk/mik/#dod-2-iii-4-por-doboru-kadriv)
Material and technical Provision	Material and technical support complies with the licensing conditions. The educational process is carried out in laboratories and specialized offices of the Department of Biology and Chemistry, which are equipped with proper modern equipment. There is specialized computer equipment with the necessary software and unlimited open access to the Internet. Users of the system use more than 450 personal computers and laptops every day. The number of personal computers placed in classrooms and freely available to students is more than 160. The institute has a broadband wired and wireless (Wi-Fi) network covering the entire territory of the educational institution. Structural subdivisions, infrastructure, areas and equipment of

	the institute premises used in the educational process comply with sanitary standards, requirements of fire safety rules (https://kmf.uz.ua/uk/infocenter/). All the necessary social and household infrastructure is available, the number of places in dormitories meets the requirements. To maintain the successful organization, conduct and quality of the educational process, as well as to ensure the professional, cultural, physical and psychological development of higher education applicants, a number of specialized structural units. In pursuance of the order of the Prime Minister of Ukraine dated 10.06.2022 No. 14529/0/1-22 regarding the creation of safe conditions for the stay of children, pupils, students and employees in educational institutions and the recommendations of the State Emergency Service of Ukraine, Rákóczi University has specially equipped shelters. This makes it possible to conduct a guaranteed safe face-to-face educational process during the announcement of an air raid.
Informational and Educational and methodological Provision	The necessary resources are provided for the organization and conduct of the educational process: - electronic information system for managing the educational process "IRIS"; Various modules, administrative, teaching and student interface of the system provides a wide range of organization and conduct of the educational process. The IRIS system contains a list of disciplines of free choice, study schedules, individual curricula of applicants, etc. - the official website of the http://kmf.uz.ua/uk/ contains information about educational programs, educational, scientific and educational activities, structural units, admission rules, contacts; - unlimited access of teachers and students to the Internet is provided; - scientific library, reading rooms; - virtual learning environment Google Classroom, Google Meet, Zoom; - training and work plans; - schedules of the educational process; - educational and methodological complexes of disciplines; - didactic materials for independent and individual work of students in disciplines; - internship programs; - methodological guidelines for the implementation and design of master's theses . Applicants for higher education who master the Biology and Biochemistry program can use the funds of the library of the center "Opacsoi Csere János", which includes the Central Reading Room, the Subscription of Scientific and Educational Literature, the Department of Fiction Subscription, the Hall of Periodicals, the Department of Multimedia Documents and the Handwriting Department. The amount of funds is sufficient for independent and individual work of full-time and part-time students. The full volume of the library's book fund includes

	more than 147 thousand cataloged and available copies of scientific and educational literature. The library's receipts consist of textbooks, manuals, periodicals, reference and other educational literature. Students have the opportunity to use the funds of the electronic library, which contains scientific and scientific-methodological publications of leading domestic and foreign scientists. Center for Informatics. Puskás Tivodor of the Transcarpathian Hungarian University named after Ferenc Rákóczi II ensures the functioning of the information network and computer system of the institution.
9 - Academic mobility	
National Credit Mobility	According to the legislation and agreements between higher education institutions .
International credit mobility	According to the European Union program - ERASMUS+ (https://kmf.uz.ua/hu/erasmus/), which supports cooperation projects, partnerships, activities and mobility in the field of education, vocational training, youth and sports. According to the agreements between higher education institutions of the Carpathian Basin countries under the Makovets mobility program, which supports the academic mobility of higher education applicants, as well as scientific and pedagogical workers (https://hl.nu/lqp-B)
Study foreign languages applicants for higher education	Not accredited.

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

2.1. List of ESP components

Code E/C	Components of the EP (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Shape final control
1	2	3	4
1.	MANDATORY COMPONENTS OF THE EP		
1.1.	Compulsory general scientific training	13	
EC 1	Basics of professional communication in a foreign language	4	Credit
EC2	Academic Integrity and Intellectual Property Rights in Higher Education Institutions	3	Exam
EC 3	Occupational health and safety in an industry with the basics of bioethics and biosafety	3	Credit
EC 4	Ukrainian language (by professional direction)	3	Credit
1.2.	Compulsory professional and scientific training	53	
EC 5	Applied botany	4	Credit
EC 6	Methods of Conducting Introduction Studies and the Basics of Acclimatization	3	Exam
EC 7	Flora and vegetation of Ukraine (I)	4	Credit
EC 8	Methodology of Modern Scientific Research in Biology	4	Credit
EC 9	Reserves and national parks of the world	4	Credit
EC 10	Nanomaterials and nanobiology	5	Exam
EC 11	General Issues of Biotechnology and Genetic Engineering of Plants	4	Exam
EC 12	Flora and vegetation of Ukraine (II)	4	Exam
EC 13	Methods of teaching biological disciplines in higher education institutions	3	Exam
EC 14	Study of aquatic organisms and aquatic ecosystems	4	Exam
EC 15	Evolutionary foundations of biodiversity	3	Exam
EC 16	Applied methods for studying the state of biota	5	Exam
EC 17	Instrumental methods of analysis	3	Exam
EC 18	Biochemistry	3	Exam
1.3.	Mandatory practical training and certification	22	
EC 19	Production (research) practice	3	Credit
EC 20	Assistant (pedagogical) practice	4	Credit
EC 21	Preparation of the master's thesis	12	Credit
EC 22	Attestation (Comprehensive qualification exam; Master's thesis defense)	3	Exam

2.	SELECTIVE COMPONENTS OII*	32	
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	TOTAL VOLUME OII	120	
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* A higher education applicant has the right to freely choose disciplines in the amount of 32 credits offered by university departments: <https://kmf.uz.ua/uk/studentam/disciplini-vilnogo-viboru/>

2.2. Structural and logical sequence of components ESP

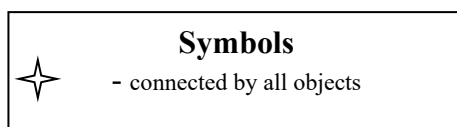
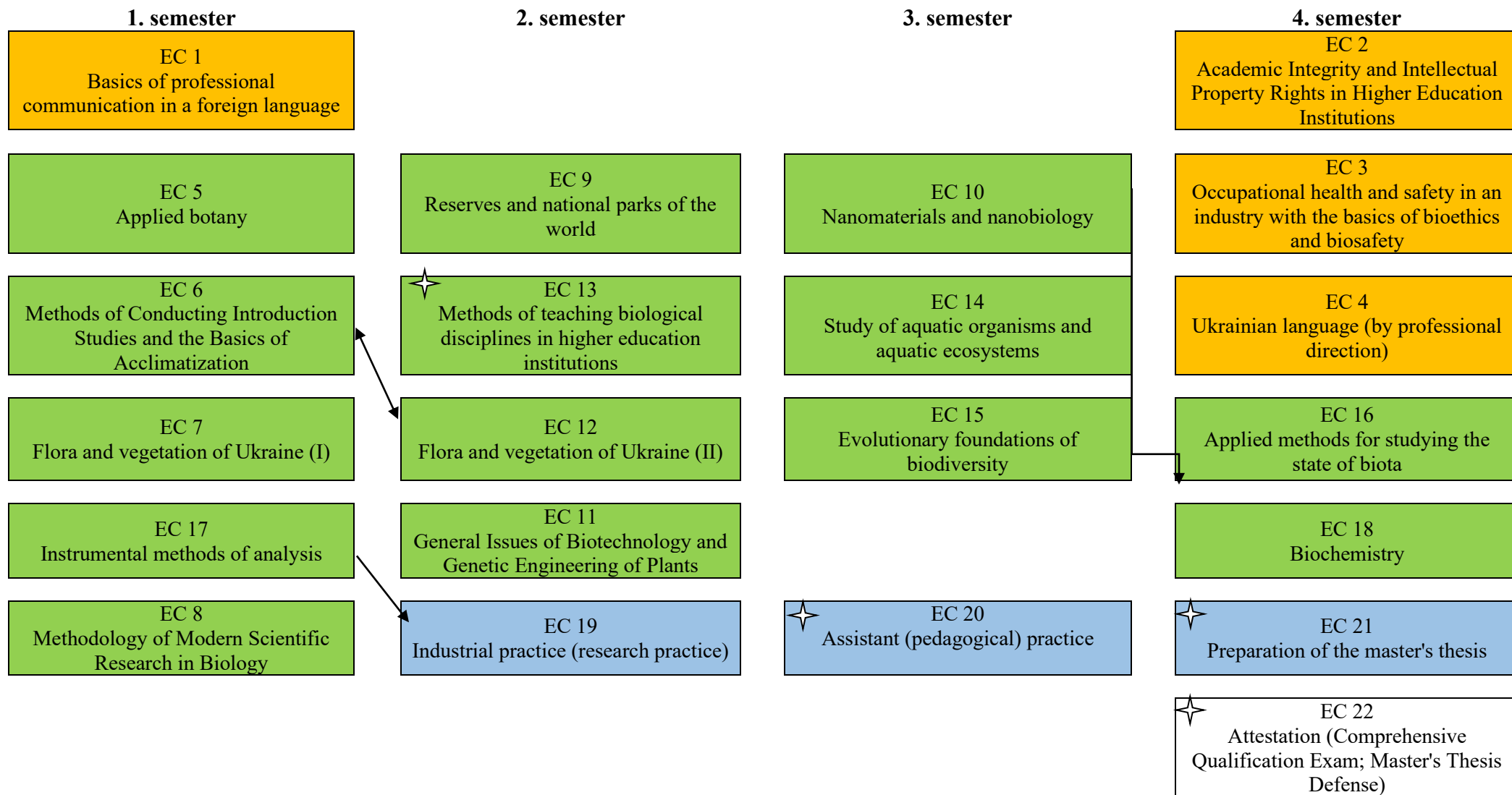
The sequence of educational activities of the applicant (full-time, part-time form of study):

sn	Code EC	Component Name EP (academic disciplines, course projects (works), practices, qualification work)	Component Type	Loans
1	2	3	4	5
I semester – 30 credits				
1	EC 1	Basics of professional communication in a foreign language	Required component of general scientific training	4
2	EC 5	Applied botany	Mandatory component of professional and scientific training	18
3	EC 6	Methods of Conducting Introduction Studies and the Basics of Acclimatization		
4	EC 7	Flora and vegetation of Ukraine (I)		
5	EC 8	Methodology of Modern Scientific Research in Biology		
6	EC 17	Instrumental methods of analysis		
7	FC	Discipline of free choice №1	Selective component of the free choice of higher education applicants	8
8	FC	Discipline of free choice №2		
II semester – 30 credits				
1	EC 9	Reserves and national parks of the world	Mandatory component of professional and scientific training	15
2	EC 13	Methods of teaching biological disciplines in higher education institutions		
3	EC 11	General Issues of Biotechnology and Genetic Engineering of Plants		
4	EC 12	Flora and vegetation of Ukraine (II)		
5	FC	Discipline of free choice №3	Selective component of the free choice of higher education applicants	12
6	FC	Discipline of free choice №4		
7	FC	Discipline of free choice №5		
8	EC 19	Industrial practice (research practice)	Mandatory component of practical training	3
III semester – 30 credits				
1	EC 10	Nanomaterials and nanobiology	Mandatory component of professional and scientific training	14
2	EC 14	Study of aquatic organisms and aquatic ecosystems		
3	EC 15	Evolutionary foundations of biodiversity		
4	FC	Discipline of free choice №6	Selective component of the free choice of higher education applicants	12
5	FC	Discipline of free choice №7		
6	FC	Discipline of free choice №8		
7	EC 20	Assistant (pedagogical) practice	Mandatory component of practical training	4
IV semester – 30 credits				
1	EC 2	Academic Integrity and Intellectual Property Rights in Higher Education Institutions	Required component of general scientific training	9
2	EC 3	Occupational health and safety in an industry with the basics of bioethics and		

		biosafety		
3	EC 4	Ukrainian language (by professional direction)		
4	EC 16	Applied methods for studying the state of biota	Mandatory component of professional and scientific training	6
5	EC 18	Biochemistry		
6	EC 21	Підготовка магістерської роботи	Mandatory component of practical training	12
7	EC 22	Attestation (Comprehensive Qualification Exam)	Attestation	3
		Attestation (Master's thesis defense)		

3. Structure of the ESP components

Training Components	Hours	Loans	Proportion of components, %
1. Required components EP	2640	88	73
1.1. Compulsory general scientific training	390	13	10,7
1.2. Compulsory professional and scientific training	1590	53	44
1.3. Mandatory practical training	570	19	15,8
Attestation	90	3	2,5
2. Selective components EP	960	32	27
At once for the EP	3600	120	100



Structural and logical diagram of the component ESP

FORMS OF ATTESTATION OF APPLICANTS FOR THE SECOND (MASTER'S) LEVEL OF HIGHER EDUCATION

Attestation form for applicants Higher Education	Attestation is carried out in the form of a qualification exam in profiling disciplines and public defense of the master's thesis and ends with the issuance of a diploma of the established form on the award of a master's degree of higher education with the assignment of educational qualifications: master in biology and biochemistry.
Requirements for the Master's Thesis	A master's thesis is an independent detailed research that offers the solution of a specialized problem and/or a practical problem in biology using scientific methods. The master's thesis must not contain academic plagiarism, fabrication and/or falsification and, after defense, must be placed in the repository and library of the Transcarpathian Hungarian University named after Ferenc Rákóczi II.
Requirements for the qualification exam	The qualification exam provides for the assessment of learning outcomes determined by the educational program.

INTERNAL SUPPORT SYSTEM QUALITIES OF HIGHER EDUCATION

They are determined in accordance with the European Standards and Recommendations for Quality Assurance in Higher Education (ESG) and Article 16 of the Law of Ukraine "On Higher Education". Internal quality assurance of higher education is carried out in accordance with the Concept of Quality Assurance of Education (<https://kme.org.ua/uk/mik/>) at the Transcarpathian Hungarian University named after Ferenc Rákóczi II, which is published on the website of the university (<https://kme.org.ua/uk/>).

The system of quality assurance of educational activities at Rákóczi University, the quality of higher education (internal quality assurance system) and the quality of the educational program is implemented in accordance with the current [institutional structure](#) and the system of monitoring the quality of education and provides for the implementation of the following procedures and measures:

- 1) determining the principles and procedures for ensuring the quality of higher education;
- 2) monitoring and periodic review of educational programs;
- 3) annual assessment of higher education applicants, scientific, pedagogical and pedagogical staff of Rákóczi University and regular publication of the results of assessments on the official website of the Institute, on information stands and in any other way;
- 4) provision of advanced training of pedagogical, scientific and scientific-pedagogical workers in the form of internship or advanced training courses;
- 5) ensuring the availability of the necessary resources for the organization of the educational process, including independent work of students, for each educational program;
- 6) ensuring the availability of information systems for effective management of the educational process;
- 7) ensuring the publicity of information about educational programs, higher education degrees and qualifications;
- 8) ensuring an effective system for preventing and detecting academic plagiarism in the scientific works of UR employees and higher education applicants;
- 9) other procedures and measures.

Rákóczi University has the [Department of Quality Assurance of Higher Education](#), Student Self-Government Bodies (<https://kme.org.ua/uk/strukturni-pidrozdily/organi-studentskogo-samovrjaduvannja/>).

The mechanism for creating and periodically reviewing an educational program is laid down in the Regulations on the Preparation and Updating of Educational Programs (<https://kme.org.ua/uk/mik/#dod-2-i-10-pol-sklad-onovl-osv-prohr>).

The project group of the specialty E1 Biology and Biochemistry monitors the educational program, which provides for the analysis and evaluation of the content and relevance of the program, changes in the needs of society and the labor market; educational load, academic achievements and academic performance of higher education applicants; expectations, needs and satisfaction of higher education applicants regarding the program; compliance of the learning environment with the purpose of the educational program. The support group (scientific and pedagogical staff) organizationally supports the process of training higher education applicants throughout the entire period of study, analyzes its relevance, compliance of the educational program with current regulatory documents, recommendations of the Ministry of Education and Science of Ukraine, requirements of employers and the community of applicants and, if necessary, develops changes to curricula and other documentation.

In addition, the constant analysis and evaluation of the educational program is carried out by other participants in the monitoring of the educational process, in particular, students after studying academic disciplines; external stakeholders – graduates working in their specialty, employers, etc.

Rákóczi University implements the concept of student-centered learning. In order to improve the quality of the educational process at the university, as well as in order to improve the quality of services provided by the university, a mandatory questionnaire is conducted in each semester in order to evaluate the work of the teacher and measure the level of student satisfaction (<https://kme.org.ua/uk/mik/#dod-2-ii-8-pol-anketuvannya>). The results of the questionnaire are used to improve the educational program. Comments and suggestions of interested stakeholders to the educational program are posted on the official website of Rákóczi University.

A mechanism for evaluating the achievements of applicants, scientific and pedagogical workers on the basis of ratings of research, methodological and organizational work, as well as rating teachers based on the results of a questionnaire of higher education applicants has been introduced. It is laid down in the "Regulations on the System of Rating Assessment and Certification of Scientific and Pedagogical Personnel (<https://kme.org.ua/uk/mik/#dod-2-iii-7-pol-sist-rejtin-h-ocin>)

At Rákóczi University, advanced training of pedagogical and scientific-pedagogical staff is carried out in the following types: training under the advanced training program; internship; participation in seminars, workshops, workshops, trainings, webinars, master classes, etc. Advanced training of scientific and pedagogical workers who provide the educational process according to the educational program takes place on a regular basis. Work is underway to strengthen the practical component of improving their skills in the system of non-formal and informal education, in particular, through internships in institutions and organizations within Ukraine and abroad, participation in international projects, grant programs, and training in certification programs.

Popularization of the principles of academic integrity, their implementation in the educational and scientific activities of the university is carried out on the basis of general outlined provisions (<https://kme.org.ua/uk/akademichna-dobrochesnist/>).

The system of quality assurance of educational activities of higher education institutions and the quality of higher education (internal quality assurance system) at the request of higher education institutions is evaluated by the National Agency for Quality Assurance of Higher Education.

REQUIREMENTS FOR THE STRUCTURE OF SYLLABUSES OF EDUCATIONAL COMPONENTS

The syllabus of educational components (academic discipline, practice) contains the following components:

1) General information. Name of the university, degree of higher education, form of study; name of the academic discipline, department, educational program, type of discipline (compulsory or elective); number of credits, number of hours; surname, first name, academic degree, academic rank, e-mail address of the teacher or teachers; prerequisites of the academic discipline.

2) Abstract of the discipline. The place of this discipline in the curriculum, the objectives of the discipline, the purpose and expected program results of the academic discipline, the characteristics of the academic discipline, etc.

3) Topics of the discipline. Topics of lectures, seminars and laboratory classes, independent work.

4) Criteria for monitoring and evaluating learning outcomes. Forms of control and criteria for successful completion of the final assessment, deadlines, etc.

5) Policy of the academic discipline. The policy of the academic discipline is determined by the system of requirements that the teacher imposes on the student when studying the discipline and is based on the principles of academic integrity. Requirements may relate to attending classes, rules of conduct in the classroom, performing the required minimum of academic work, etc.

6) Recommended and auxiliary literature of the academic discipline and other information resources.

LIST OF REGULATORY DOCUMENTS ON WHICH THE EDUCATIONAL PROGRAM IS BASED

1. Закон України «Про вищу освіту» (від 01.07.2014 № 1556-VII). Access mode: <http://zakon4.rada.gov.ua/laws/show/1556-18>;
2. Закон України «Про освіту» (від 05.09.2017 № 2145-VIII). Access mode: <http://zakon5.rada.gov.ua/laws/show/2145-19>;
3. Класифікатор професій: ДК 003: 2010 / [розроб.: М. Гаврицька та ін.]. - К.: Соцінформ: Держспоживстандарт України, 2010. - 746 с.;
4. Наказ Міністерства освіти і науки України від 01.06.2016 № 600 «Про затвердження та введення в дію Методичних рекомендацій щодо розроблення стандартів вищої освіти». Access mode: <https://mon.gov.ua/storage/app/media/vishchaosvita/rekomendatsii-1648.pdf>;
5. Постанова Кабінету міністрів України від 23.11.2011 № 1341 «Про затвердження Національної рамки кваліфікацій». <http://zakon4.rada.gov.ua/laws/show/1341-2011-п>;
6. Національна рамка кваліфікації. Затверджено Постановою Кабінету Міністрів України від 23.11.2011 р. «Про затвердження Національної рамки кваліфікацій» № 1341. <https://zakon.rada.gov.ua/laws/show/1341-2011-%D0%BF/paran12#n12>;
7. Постанова Кабінету міністрів України від від 29 квітня 2015 р. № 266 «Про затвердження переліку галузей знань і спеціальностей, за якими здійснюється підготовка здобувачів вищої та фахової передвищої освіти» (із змінами № 188 від 21.02.2025). Access mode: <https://zakon.rada.gov.ua/laws/show/266-2015-%D0%BF#Text>;
8. «Розроблення освітніх програм. Методичні рекомендації.» Авт.: В.М. Захарченко, В.І. Луговий, Ю.М. Рашкевич, Ж.В. Таланова / За ред. В.Г. Кременя. – Київ: ДП «НВЦ «Пріоритети», 2014. – 120 с. Access mode: http://ibhb.chnu.edu.ua/uploads/files/metodrada/Rozroblennya_osv_program.pdf;
9. Розроблення освітніх програм. Методичні рекомендації [Режим доступу: http://ihed.org.ua/images/doc/04_2016_rozroblennya_osv_program_2014_tempusoffice.pdf];
10. Європейська кредитна трансферна накопичувальна система: Довідник користувача. Access mode: http://ihed.org.ua/images/doc/04_2016_ECTS_Users_Guide-2015_Ukrainian.pdf;
11. EQF-LLL – European Qualifications Framework for Lifelong Learning. Access mode: https://ec.europa.eu/ploteus/sites/eac-eqf/files/brochexp_en.pdf;
12. QF-EHEA – Qualification Framework of the European Higher Education Area. Access mode: <http://www.ehea.info/article-details.aspx?ArticleId=67>;
13. Стандарт вищої освіти України. Рівень вищої освіти: Другий (магістерський) рівень. Ступінь вищої освіти: Магістр. Галузь знань: 09 «Біологія». Спеціальність: 091 «Біологія». Київ: Міністерство освіти і науки України, 2019 р. Затверджено Наказом МОН України від 21.11.2019 р. № 1458. Access mode: <https://mon.gov.ua/storage/app/media/vishcha-osvita/zatverdzeni%20standarty/2019/11/22/2019-11-22-091-M.pdf>;
14. Наказ Міністерства розвитку економіки, торгівлі та сільського господарства від 23.03.2021 № 610 про затвердження професійного стандарту на групу професій «Викладачі закладів вищої освіти». Access mode: <https://mon.gov.ua/ua/news/zatverdzheno-standart-na-grupu-profesij-vikladachi-zakladiv-vishoyi-osviti>;
15. Наказ №1006 Міністерства освіти і науки України від 11.11.2022 р. «Деякі питання розміщення державного (регіонального) замовлення, поєднання спеціальностей (предметних спеціальностей), спеціалізацій та присвоєння професійних кваліфікацій

- педагогічних працівників закладами фахової передвищої, вищої освіти». Access mode: <https://zakon.rada.gov.ua/laws/show/z1669-22#n33>;
16. Наказ ЗУІ імені Ференца Ракоці II №113-Вн від 21 грудня 2023 р. «Про затвердження назв структурних підрозділів ЗУІ». Access mode: <https://kmf.uz.ua/uk/strukturni-pidrozdily/>;
 17. Закон ВР України «Про забезпечення функціонування української мови як державної», документ 2704-VIII, чинний, поточна редакція від 31.12.2023, підстава - 2801-IX. Access mode: <https://zakon.rada.gov.ua/laws/show/2704-19#Text>;
 18. Наказ ЗУІ імені Ференца Ракоці II № 12-Вн від 31 січня 2024 р. Про обов'язкове включення державної мови як окремої навчальної дисципліни до освітніх програм від 2024/2025 навчального року;
 19. Наказ ЗУІ імені Ференца Ракоці II № 17-Вн від 15 лютого 2024 р. Про забезпечення якісного вивчення, викладання та використання англійської мови у ЗУІ. Access mode: <https://kme.org.ua/uk/category/nakazi/>;
 20. Наказ Міністерства освіти і науки України від 25.07.2023 № 898 «Методичні рекомендації щодо забезпечення якісного вивчення, викладання та використання англійської мови у закладах вищої освіти України». Access mode: <https://zakon.rada.gov.ua/rada/show/v0898729-23#Text>;
 21. Постанова Кабінету міністрів України від 15 грудня 2023 р. № 1322 «Про схвалення Стратегії утвердження української національної та громадянської ідентичності на період до 2030 року та затвердження операційного плану заходів з її реалізації у 2023-2025 роках». Access mode: <https://zakon.rada.gov.ua/laws/show/1322-2023-%D0%BF#n18>;
 22. Наказ № 1466 Міністерства освіти і науки України від 16 жовтня 2024 р. «Про затвердження професійного стандарту «Викладач закладу вищої освіти». Access mode: https://osvita.ua/legislation/Vishya_osvita/93388/;
 23. International Standard Classification of Education. Fields of education and training 2013 (ISCED F 2013). Detailed field descriptions, UNESCO, Montreal, Quebec, 2015. Access mode: <http://dx.doi.org/10.15220/978-92-9189-179-5-en>;

APPENDICES

Table 1. Matrix of correspondence of program competencies to the components of the educational program

	EC 1	EC 2	EC 3	EC 4	EC 5	EC 6	EC 7	EC 8	EC 9	EC 10	EC 11	EC 12	EC 13	EC 14	EC 15	EC 16	EC 17	EC 18	EC 19	EC 20	EC 21	EC 22
IC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
GC01	+								+		+						+	+	+	+	+	
GC02	+			+	+			+					+						+		+	+
GC03						+		+			+	+		+	+	+	+	+	+		+	+
GC04		+	+																	+	+	
GC05		+									+						+	+	+		+	
GC06			+			+	+	+	+	+	+	+		+	+	+	+	+	+		+	
GC07	+	+		+									+							+		
GC08	+		+						+				+						+			
GC09		+	+																+	+		
GC10			+					+								+			+	+		
SC01	+			+	+	+	+	+		+	+	+		+	+	+	+	+	+		+	+
SC02					+	+		+						+					+		+	+
SC03	+		+	+		+		+	+				+	+					+		+	+
SC04	+			+			+		+	+	+	+			+	+	+	+	+		+	+
SC05			+					+			+				+	+	+	+	+		+	
SC06								+			+				+	+	+	+	+		+	
SC07							+		+	+		+							+		+	
SC08	+	+		+				+					+						+		+	+
SC09	+	+	+	+																+	+	
SC10		+		+									+							+	+	+
SC11													+							+	+	
SC12		+											+							+	+	
SC13								+							+						+	+

**Table 2. Program Learning Outcomes (PLO) Matrix
relevant components of the educational program**

	EC1	EC 2	EC 3	EC 4	EC 5	EC 6	EC 7	EC 8	EC 9	EC 10	EC 11	EC 12	EC 13	EC 14	EC 15	EC 16	EC 17	EC 18	EC 19	EC 20	EC 21	EC 22
PLO1	+	+		+		+	+	+			+	+	+	+			+	+	+	+	+	+
PLO2	+	+		+	+	+	+	+	+	+	+	+	+	+	+		+	+		+		+
PLO3				+																		
PLO4																	+	+	+		+	
PLO5	+			+	+			+			+								+	+	+	+
PLO6			+			+	+	+	+	+	+	+		+	+	+	+	+	+		+	+
PLO7						+		+	+	+	+			+	+	+			+		+	+
PLO8			+				+					+	+	+			+	+	+		+	+
PLO9						+		+			+						+		+	+	+	
PLO10	+	+		+				+			+								+		+	+
PLO11		+			+	+	+	+				+		+		+	+	+	+		+	
PLO12								+		+					+				+		+	+
PLO13			+			+					+						+	+	+		+	+
PLO14	+	+	+	+				+			+		+								+	+
PLO15	+	+											+							+	+	+
PLO16					+			+	+	+	+				+	+			+		+	
PLO17		+											+							+	+	
PLO18	+							+					+							+	+	