

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
RIVNE STATE UNIVERSITY OF THE HUMANITIES

EDUCATIONAL-PROFESSIONAL PROGRAM

«Biology»

Second (master's) level of higher education

specialty 091 – Biology

field of knowledge 09 – Biology

Qualification: master in Biology. Biologist, teacher of  
Biology

APPROVED BY THE ACADEMIC BOARD OF  
Rivne State University of the Humanities

Head of the Academic board

/Prof. R. M. Postolovskiy/

(minutes № 1 dated 27. 01. 2022)



Educational-professional program  
shall take effect on September 1, 2022

Rector

/Prof. R. M. Postolovskiy/


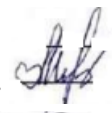
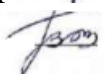
(decree № 10-01-01 dated 27. 01. 2022)

Rivne 2022

**Letter of approval**  
of the educational-professional program  
«Biology»

LEVEL OF HIGHER EDUCATION	second
DEGREE OF HIGHER EDUCATION	master
FIELD OF KNOWLEDGE	09 Biology
SPECIALTY	091 Biology
QUALIFICATION	master in Biology. Biologist, teacher of Biology

**Program developers:**

1. Oitsius L.V., PhD in Biology, Associate Professor  (guarantor of the program)
2. Martsynovskyi V.P., PhD in Biology, Professor 
3. Zahoruiko H.Ye., Doctor in Biology, Professor 

**SUGGESTED BY**

Department of Biology, Human Health and Physical Therapy  
Minutes № 1 dated 24.01 2022.

Head of the Department 

Prof. V.P. Martsynovskyi


**APPROVED BY**

Educational-methodological commission of the Psychology and Natural Sciences Faculty

Minutes № 1 dated 25. 01 2022

Head of the EMC of the faculty 

Ass. Prof. I. O. Siaska.

Dean of the faculty 

Prof. V. R. Pavelkiv

Head of the EMB of the university 

Prof. I. S. Voitovych

## I Preface

The educational-professional program is a normative document that regulates regulatory, competence, qualification, organizational, educational and methodological requirements in the preparation of higher education applicants of the educational level "master" in the field of knowledge 09 Biology in the specialty 091 Biology.

The educational-professional program is based on a competency, student-centered and problem-oriented approach to the training of higher education applicants of the master's degree program in the field of knowledge 09 Biology in the specialty 091 Biology.

The program was developed on the basis of the Standard of Higher Education of Ukraine: second (master's) level, field of knowledge 09 "Biology", specialty 091 "Biology" approved and put into effect by the order of the Ministry of Education and Science of Ukraine dated November 21, 2019 No. 1458.

*Head of the project group (guarantor of the program):*

**Oitsius Larysa Vitaliivna**, PhD in Biology, Associate Professor of the Department of Biology, Human Health and Physical Therapy of Rivne State University of the Humanities.

*Members of the project group:*

**Zahoruiko Henadii Yevhenovych**, Doctor in Biology, Professor of the Department of Biology, Human Health and Physical Therapy of Rivne State University of the Humanities

**Martsynovskyi Vitalii Petrovych**, PhD in Biology, Associate Professor of the Department of Biology, Human Health and Physical Therapy of Rivne State University of the Humanities.

*Reviews of external stakeholders:*

**Hutsman Serhii Volodymyrovych**, PhD in Biology, acting Head of the Department of Medical-Biological Disciplines of the Educational-Scientific Institute of Healthcare of the NUWEE

**Mandyhra Yuliia Mykolaivna**, PhD in Agriculture, Director of the Epizootology Research Station of the Institute of Veterinary Medicine of the NAAS.

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**1. Profile of the educational program in specialty  
091 «Biology»**

<b>1. Profile of the educational program in specialty 091 «Biology»</b>	
<b>1 – General information</b>	
<b>Full name of the higher educational institution and structural subdivision</b>	Rivne State University of the Humanities, Psychology and Natural Sciences Faculty, Department of Biology, Human Health and Physical Rehabilitation
<b>Higher education degree and title of qualification in the original language</b>	Master in Biology. Biologist. Teacher of Biology
<b>The official name of the educational program</b>	«Biology»
<b>Type of diploma and scope of educational program</b>	Master's degree, unitary, 90 ECTS credits, term of study – 1 year 4 months
<b>Availability of accreditation</b>	Issued by the Accreditation Commission of Ukraine; Certificate of accreditation УД № 18006875
<b>Cycle/level</b>	National qualifications of Ukraine – Level 7, FQ-EHEA – second cycle, EQF-LLL – Level 7
<b>Prerequisites</b>	Bachelor's degree, qualification level “Specialist”, master's degree in other specialty
<b>Language(s) of instruction</b>	Ukrainian, english
<b>Validity of the educational-professional program</b>	For the period of study
<b>Internet address of the permanent placement of the description of the educational program</b>	<a href="http://www.rshu.edu.ua/navchannia/osvitni-prohramy/mahistr">http://www.rshu.edu.ua/navchannia/osvitni-prohramy/mahistr</a>
<b>2 – the purpose of the educational program</b>	
Training of highly qualified, competitive specialists in the field of biological science with wide access to employment. A Master of Biology must be prepared to carry out educational activities that require deep and thorough knowledge in the field of biology and in-depth professional specialization, mastery of research skills, experimental methods and approaches in modern biology, technologies of the laboratory-diagnostic process, organization and management of the laboratory, information technologies; be widely erudite, have a fundamental scientific base.	
<b>3 – Characteristics of the educational program</b>	
<b>Subject area (field of knowledge, specialty, specialization)</b>	Field of knowledge 09 Biology. Specialty 091 Biology <i>The object of study:</i> the structure, functions and life processes of biological systems of different levels of organization, the regularities of the flow of onto- and phylogeny and successional dynamics; 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 goals:</i> training specialists capable of solving complex specialized tasks and practical problems in the field of biology or in the learning process, which are characterized by complexity and uncertainty of conditions and involve the application of laws, theories and methods of natural sciences. <i>Theoretical content of the subject area:</i> structure, functions and life processes, taxonomy, methods of research of non-cellular life forms, prokaryotes and eukaryotes. Structural and functional

	<p>characteristics of biological systems at different levels of organization. Mechanisms of preservation, realization and transmission of genetic information in organisms. Forms of relationships between micro- and macro-organisms. Evolutionary ideas of the organic world. Structure and functions of the immune system, mechanisms of immune reactions, their regulation and control. Concepts, concepts, principles, laws of modern biological science and their use for assessing the state of biological systems at various levels of organization, presenting and using the results of biological research.</p> <p><i>Methods, techniques and technologies:</i> methods of laboratory and field biological research, monitoring, bioinformatics, mathematical and statistical processing of experimental data and interpretation of the results of biological research, information and communication technologies, methods of empirical research and modeling of processes and phenomena of vital activity of biological systems at various levels of organization.</p>
<b>Type of the educational program</b>	Educational-professional program for the second (master's) level of higher education, aimed at training applicants capable of solving complex specialized tasks in the field of biology.
<b>The main focus of the educational program and specialization</b>	<p>Special education in the field of biology, aimed at general scientific ideas about modern research in the field of biology, taking into account the specifics of the work of research institutions, enterprises, companies, higher education institutions. The program has scientific, theoretical, professional and applied components.</p> <p><i>Key words:</i> biology, zoology, hydrobiology and general ecology, human and animal physiology, genetics and molecular biology, botany, biochemistry, microbiology, virology, biotechnology, life safety.</p>
<b>Features of the program</b>	Provision of an individual trajectory of professional training of a specialist in biology. Interdisciplinary and multidisciplinary training of specialists in the field of Biology. The structure of the program involves dynamic, integrative and interactive learning. Conducting scientific research using a wide range of modern microbiological, biochemical, biotechnological, entomological, field and ecological methods. Research is aimed at the protection, preservation and rational use of biodiversity of the Western region of Ukraine, natural resources of Ukraine.
<b>4. Possibilities of graduates for employment and further study</b>	
<b>Possibilities for employment</b>	<p>Graduates can work in professions according to the National Classifier "State Classifier of Professions DK 003:2010" (with amendments)</p> <p>22 Life Sciences and Medical Sciences Professionals  221 Life Sciences and Medical Sciences Professionals  2211 Biologists, botanists, zoologists and related professionals  2211.1 Research staff (biology, botany, zoology, etc.)  2211.2 Biologists, botanists, zoologists and related professionals  2211.2 20275 25 Biologist;  2310.2 20199 Assistant  2310.2 Teacher of a higher education institution</p>
<b>Further study</b>	Graduates have the right to continue their studies at the third educational and scientific level of higher education. Acquisition of

	qualifications in other specialties in the postgraduate education system.
<b>5 – Teaching and assessment</b>	
<b>Teaching and learning</b>	<p>Student-centered, practice-oriented learning, proactive self-learning. Practice-oriented training with elements of self-study using such methods and technologies as: collection, processing and interpretation of research results; skills of research and production, design, organizational and managerial activities.</p> <p>According to the dominant methods and ways of learning: active (problematic, information-computer, interactive, self-learning), passive (explanatory and illustrative).</p> <p>According to the organizational forms: collective and integrative training.</p> <p>According to the orientation of pedagogical interaction: positional and contextual learning, modeling technology of professional activity.</p> <p>Emphasis is placed on personal self-development, which will contribute to the formation of the need and readiness to continue self-education throughout life.</p>
<b>Assessment</b>	<p>Types of control: current, modular, final, self-control.</p> <p>Forms of control: oral and written survey, test tasks, exams, practices, coursework.</p> <p>Evaluation of students' educational achievements is carried out on a four-level (excellent, good, satisfactory, unsatisfactory) or two-level national scale (passed/failed); 100-point system. Final attestation – public defense of the qualification (master's) paper and passing of the attestation exam.</p>
<b>6 – Program competences</b>	
<b>Integral competence</b>	The ability to solve complex tasks and problems in the field of biology during the implementation of professional activities or in the learning process, which involves conducting research and/or implementing innovations and is characterized by the uncertainty of conditions and requirements.
<b>General competences (GC)</b>	<p>GC01. Ability to work in an international context.</p> <p>GC02. Ability to use information and communication technologies.</p> <p>GC03. Ability to generate new ideas (creativity).</p> <p>GC04. Ability to act based on the ethical considerations (motives).</p> <p>GC05. Ability to develop and manage projects.</p> <p>GC06. Ability to conduct research at an appropriate level.</p> <p>GC07. Acquisition of basic knowledge of the profession in an amount sufficient for independent work in the specialty.</p>
<b>Special (professional) competences (SC)</b>	<p>SC01. Ability to use the latest advances in biology necessary for professional, research and/or innovative activities.</p> <p>SC02. Ability to formulate modeling tasks, create models of objects and processes on the example of different levels of living organization using mathematical methods and information technologies.</p> <p>SC03. Ability to use modern information technologies and analyze information in the field of biology and on the border of subject areas.</p> <p>SC04. Ability to analyze and generalize the results of research on various levels of living organisms, biological phenomena and</p>

	<p>processes.</p> <p>SC05. Ability to plan and perform experimental work using modern methods and equipment.</p> <p>SC06. Ability to predict the directions of development of modern biology based on a general analysis of the development of science and technology.</p> <p>SC07. Ability to diagnose the state of biological systems based on the results of the study of organisms at different levels of the organization</p> <p>SC08. Ability to present and discuss the results of scientific and applied research, prepare scientific publications, participate in scientific conferences and other events.</p> <p>SC09. Ability to apply copyright law for practical purposes.</p> <p>SC10. Ability to use the results of scientific research in practical activities.</p> <p>SC11. Ability to conduct safe behavior in relation to oneself, other people and the environment.</p> <p>SC12. Ability to understand the essence of the relationship between the natural environment and a human, to understand and explain the strategy of sustainable development of humankind.</p> <p>SC13. Ability to form motivation for health-preserving activities aimed at the safety of life activities and the formation of a healthy lifestyle.</p> <p>SC14. Ability to perceive and apply modern environmental protection technologies in order to optimize the balanced use of nature and preserve natural resources.</p> <p>SC15. Ability to apply the basics of pedagogy and psychology in the educational process in higher educational institutions.</p>
<b>7 – Program learning outcomes</b>	
<p><b>Program outcomes (PLO)</b></p>	<p>PLO1. To know state and foreign languages at a level sufficient for communicating on professional issues and presenting the results of one's own research.</p> <p>PLO2. To use libraries, information databases, Internet resources to search for the necessary information, be able to perform statistical processing, analysis and generalization of the obtained experimental data using software and modern information technologies used in the field of biology.</p> <p>PLO3. To carry out coordinated work for the result in the team, taking into account public, state and industrial interests.</p> <p>PLO4. To solve complex problems in the field of biology, generate and evaluate ideas.</p> <p>PLO5. To analyze and evaluate the impact of the achievements of biology on the development of society.</p> <p>PLO6. To analyze biological phenomena and processes at the molecular, cellular, organismal, population-species and biosphere levels from the point of view of fundamental general scientific knowledge, as well as using special modern research methods.</p> <p>PLO7. To describe and analyze the principles of structural and functional organization, mechanisms of regulation and adaptation of organisms to the influence of various factors.</p> <p>PLO8. To apply knowledge of the peculiarities of the development of modern biological science, the main methodological principles of</p>

	<p>scientific research, methodological and methodical tools for conducting scientific research by specialization during research.</p> <p>PLO9. To plan scientific research, choose effective research methods and their material support.</p> <p>PLO10. To 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 defense of the report) using modern technologies, to argue one's position in a scientific discussion.</p> <p>PLO11. To carry out statistical processing, analysis and generalization of the obtained experimental data using software tools and modern information technologies.</p> <p>PLO12. To use innovative approaches to solve complex problems of biology under uncertain conditions and requirements.</p> <p>PLO13. To comply with the basic rules of biological ethics, biosafety, bio-protection, to assess the risks of using the latest biological, biotechnological and medical-biological methods and technologies, to identify potentially dangerous organisms or production processes that may create a threat of emergency situations.</p> <p>PLO14. To adhere to the norms of academic integrity during study and conducting scientific activities, know the basic legal norms regarding the protection of intellectual property.</p> <p>PLO15. To be able to independently plan and carry out an innovative task and formulate conclusions based on its results.</p> <p>PLO16. To critically interpret theories, principles, methods from various branches of biology to solve practical tasks and problems.</p> <p>PLO17. To apply pedagogical technologies at a level sufficient for the implementation of developed programs of educational disciplines by specialization in higher educational institutions.</p>
<b>8 – Resource support for program implementation</b>	
<b>Staff</b>	Scientific and pedagogical workers who carry out the educational process have more than two years of experience in scientific and pedagogical activity and a level of scientific and professional activity that certifies the performance of at least four types and results of a person's professional activity (clause 30 of the Licensing conditions for conducting educational activities dated 30.12.2015 No. 1187 (with changes introduced in accordance with the resolution of the Cabinet of Ministers of Ukraine of 10.05.2018 No. 347)).
<b>Material and equipment support</b>	Equipment, machinery and software necessary for field, laboratory and remote studies of the structure and properties of biological systems of various levels and origins.
<b>Information and educational and methodological support</b>	The use of the virtual learning environment of Rivne State University of the Humanities and author's developments of the department's teaching staff and 100% provision of the educational content of the disciplines.
<b>9 – Academic mobility</b>	
<b>National credit mobility</b>	Based on bilateral agreements between Rivne State University of the Humanities and higher educational and scientific institutions of Ukraine. (Regulations on the procedure for exercising the right to academic mobility of Rivne State University of the Humanities)

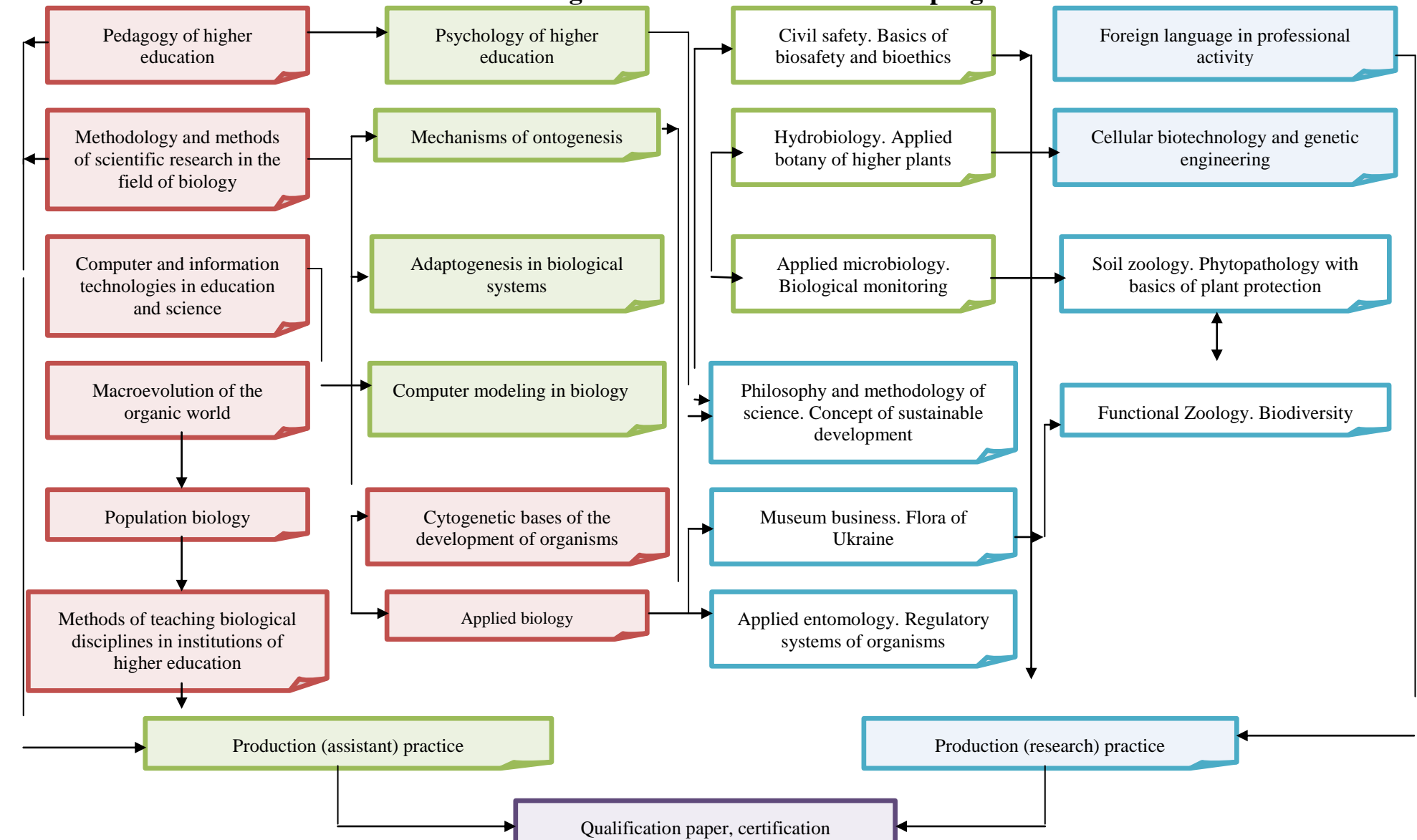


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<b>International credit mobility</b>	Based on bilateral agreements between Rivne State University of the Humanities and foreign higher educational institutions. (Regulations on the procedure for exercising the right to academic mobility of Rivne State University of the Humanities) <a href="https://www.rshu.edu.ua/images/navch/pol_akadem_mob_2019.pdf">https://www.rshu.edu.ua/images/navch/pol_akadem_mob_2019.pdf</a>
<b>Training of foreign applicants for higher education</b>	Possible

**2. List of the components of the educational program**  
**2.1 List of the components of the educational-professional program**

<b>Discipline code</b>	<b>Term</b>	<b>Components of the educational program (academic disciplines, practices, qualification paper)</b>	<b>Number of credits</b>	<b>Form of final control</b>
<b>Mandatory components</b>				
MC 1	1	Pedagogy of higher education	3,0	exam
MC 2	2	Psychology of higher education	3,0	credit
MC 3	3	Foreign language in professional activity	3,0	exam
MC 4	1	Methodology and methods of scientific research in the field of biology	3,0	credit
MC 5	1	Computer and information technologies in education and science	3,0	credit
MC 6	2	Mechanisms of ontogenesis	3,0	exam
MC 7	2	Computer modeling in biology	3,0	credit
MC 8	1	Population biology	4,0	credit
MC 9	1	Cytogenetic bases of the development of organisms	4,0	credit
MC 10	1	Methods of teaching biological disciplines in institutions of higher education	4,0	exam
MC 11	1	Applied biology	5,0	exam
MC 12	2	Adaptogenesis in biological systems	3,0	exam
MC 13	1	Macroevolution of the organic world	4,0	credit
MC 14	3	Cellular biotechnology and genetic engineering	3,0	exam
MC 15	3	Production (research) practice	6,0	credit
MC 16	2	Production (assistant) practice	6,0	credit
MC 17	2,3	Preparation of the qualification paper and certification of higher education applicants	6,0	defense exam
<b>Total amount of mandatory components</b>			<b>66,0</b>	
<b>Selective components</b>				
SC01/SC02/SC03	2	Civil safety / Basics of biosafety and bioethics / Choice	3,0	3
SC04/SC05/SC06	3	Philosophy and methodology of science/ Concept of sustainable development / Choice	3,0	3
SC07/SC08/SC09	2	Hydrobiology / Applied botany of higher plants / Choice	3,0	3
SC10/SC11/SC12	3	Museum business / Regional floristry and herbarium business /Choice	3,0	3
SC13/SC14/SC15	3	Applied entomology / Regulatory systems of organisms / Choice	3,0	3
SC16/SC17/SC18	3	Soil zoology / Phytopathology with basics of plant protection / Choice	3,0	3
SC19/SC20/SC21	3	Functional Zoology / Biodiversity / Choice	3,0	3
SC22/SC23/SC24	2	Applied microbiology / Biological monitoring / Choice	3,0	3
<b>Total amount of selective components</b>			<b>24,0</b>	
<b>Total amount of the educational program</b>			<b>90</b>	

## 2.2 Structural-logical scheme of the educational program



**Note:** ■ - MC disciplines (I term); ■ - MC disciplines and ■ - SC (II term); ■ - MC disciplines and ■ - SC (III term); ■ - qualification paper

### **3. Forms of certification of applicants for higher education**

The attestation of higher education applicants for the master's degree is carried out by the examination commission (EC) in order to establish the actual compliance of the level of training with the requirements of the educational program. The EC may include representatives of employers and their associations in accordance with the regulations on the examination commission approved by the academic council of Rivne State University of the Humanities. The head of the EC is approved by the Academic Council of Rivne State University of the Humanities from among highly qualified scientific and pedagogical workers in the relevant field of knowledge upon the proposal of the dean of the faculty. The commission includes teachers of the graduation department, representatives of employers, leading specialists in education. The personnel composition of the EC is approved by the rector no later than a month before the start of work.

The work of the EC is carried out in the terms provided by the educational plans. The commission's work schedule is approved by the rector.

The system of program learning outcomes defined in the educational program of specialist training is submitted for attestation. Form of attestation: public examination and public defense of the qualification (master's) thesis.

The qualification exam involves the assessment of learning outcomes determined by the standard and the educational program. Assessment of the level of professional competence, verification of methodological and theoretical principles, problems and provisions of educational disciplines, as well as the ability to use them in the analysis of various levels of organization and professional activity. Particular attention should be paid to identifying the knowledge and skills of higher education seekers, analyzing the methodology of scientific research, modern experimental methods, as well as information technologies to the extent necessary for the implementation of scientific research in the field of biological and medical disciplines.

A qualification (master's) paper is a scientific work performed by a master's student independently on the basis of theoretical knowledge and practical skills acquired throughout the entire period of study and research work, related to the development of specific theoretical and practical tasks of an innovative nature, determined by the specifics of the specialty.

The qualification (master's) paper is a scientific and practical work containing scientifically based theoretical and experimental results, conclusions and recommendations and testifies to the student's ability to independently conduct scientific research, analyze the methodology of scientific research, modern experimental methods of chemistry, physics, biology, as well as information technology in the amount necessary for the implementation of scientific research in the field of natural sciences.

The list of topics of qualification papers in the specialty is determined by the graduation department at the beginning of the academic year. The topic of qualification papers should be directly related to the general object of activity of a specialist of the appropriate educational level. The list of topics is approved by the rector's order. Students have the right to propose their own topic of qualification work for consideration. Tasks for qualification work must reflect all production functions and typical tasks of a specialist and must be delivered to students in a timely manner.

Professors, associate professors of the graduation department, as well as leading specialists in the field of education can be supervisors of qualification papers. Qualification (master's) papers must be checked for plagiarism and posted on the university's website or in the electronic repository of a higher education institution.





## 6. Internal assurance system of higher education quality

Rivne State University of the Humanities has a system of providing by the higher education institution the quality of educational activities and the quality of higher education (internal quality assurance system), which provides for the implementation of such procedures and measures:

1) defining the principles and procedures for ensuring the quality of higher education;

2) monitoring and periodic review of educational programs;

3) annual evaluation of applicants for higher education, research and teaching staff of the institution of higher education and regular publication of the results of such evaluations on the official website of the institution of higher education, on information stands and in any other ways;

4) providing advanced training of pedagogical, scientific and scientific-pedagogical workers;

5) ensuring the availability of the necessary resources for the organization of the educational process, including the independent work of higher education students in each educational program;

6) ensuring the availability of information systems for effective management of the educational process;

7) ensuring publicity of information about educational programs, higher education degrees and qualifications;

8) ensuring an effective system for the prevention and detection of academic plagiarism in the scientific works of employees of higher education institutions and applicants for higher education;

9) other procedures and measures.

The system of providing by the higher education institution the quality of educational activities and the quality of higher education (internal quality assurance system) may be evaluated according to the request of Rivne State University of the Humanities by the National Agency for Quality Assurance in Higher Education or independent institutions accredited by it for evaluation and quality assurance of higher education for its compliance with the requirements for the quality assurance system of higher education approved by the National Agency for Quality Assurance in Higher Education, and international standards and recommendations for quality assurance in higher education.

Guarantor of the educational program,

head of the project group



Ass. Prof. Oitsius L.V.

