

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**

**V.N. Karazin Kharkiv National University**

Name of the higher education institution

**EDUCATIONAL PROGRAMME**

**Biology**

**Second (master's) level of higher education**

**Specialty 091 Biology**

**Branch of knowledge 09 Biology**

**Qualification: Master of biology**

**APPROVED BY SCIENTIFIC COUNCIL OF  
V.N. KARAZIN KHARKIV NATIONAL  
UNIVERSITY**

**Head of Scientific Council**

\_\_\_\_\_ / V.S. Bakirov /

(protocol № \_\_ from " \_\_ " \_\_\_\_\_ 2017)

**Educational Programme is implemented from  
\_\_\_\_\_2017**

**Rector\_\_\_\_\_ /V.S. Bakirov/**

**(order № \_\_ from " \_\_ " \_\_\_\_\_ 2017)**

Kharkiv 2017

## **PREFACE**

Developed by working group composed of:

- |   |  |  |
|---|--|--|
| 1 | <b>Zhmurko Vasyl<br/>Vasyl'ovych</b>       | Leader, guarantor of educational and professional programme, Doctor of Sciences (Biology), professor, head of Department of plants and microorganisms physiology and biochemistry, dean of the School of Biology |
| 2 | <b>Bozhkov Anatoly<br/>Ivanovych</b>       | Doctor of Sciences (Biology), professor, head of Department of molecular biology and biotechnology of the School of Biology  |
| 3 | <b>Dogadina Tetiana<br/>Vasylivna</b>      | Doctor of Sciences (Biology), professor, head of Department of botany and plant ecology of the School of Biology   |
| 4 | <b>Shkorbatov Yiury<br/>Georgiyovych</b>   | Doctor of Sciences (Biology), professor, head of Department of micology and phytoimmunology of the School of Biology   |
| 5 | <b>Tokarsky Victor<br/>Arsentiiovych</b>   | Doctor of Sciences (Biology), professor, head of Department of zoology and animal ecology of the School of Biology   |
| 6 | <b>Avksentieva Olga<br/>Oleksandrivna</b>  | PhD (Biology), associate professor of Department of plant and microorganisms physiology and biochemistry of the School of Biology  |
| 7 | <b>Komarysta Victoria<br/>Pavlivna</b>     | PhD (Biology), associate professor of Department of botany and plant ecology of the School of Biology  |
| 8 | <b>Kuznetsova Yuliia<br/>Oleksandrivna</b> | PhD (Biology), associate professor of Department of molecular biology and biotechnology of the School of Biology   |
| 9 | <b>Martynenko Vira<br/>Volodymyrivna</b>   | PhD (Biology), associate professor of Department of human and animal physiology, head of the methodical commission of the School of Biology  |

## 1. The profile of the Educational Programme in the specialty 091 Biology

<b>1 – General information</b>	
<b>Full name of Higher Education Institution and Structural Unit</b>	V.N. Karazin Kharkiv National University, School of Biology
<b>Higher Education Level and qualification name</b>	Second (master) level of Higher Education Qualification: Master of Biology
<b>Official name of the Educational Programme</b>	Educational programme “Biology”
<b>Type of Diploma and Curriculum volume</b>	Master’s diploma, single, 90 ECTS credits, period of study - 1 year and 4 months
<b>Accreditation</b>	Accredited by Ministry of Education and Science of Ukraine in the master’s level, HД № 2189559 from 18 .09.2017 to 01.07.2023
<b>Cycle/Level</b>	National Qualification Framework of Ukraine – level 8, FQ-EHEA – second cycle, EQF-LLL – level 7
<b>Preconditions</b>	Bachelor’s degree/educational qualification level of specialist/master. Rules of competitive selection are determined by the University’s rules of admission to master’s educational programme.
<b>Language(s) of teaching</b>	English
<b>Period of validity of the Programme</b>	till 01.07.2023
<b>Internet address of permanent hosting of curriculum description</b>	<a href="http://start.karazin.ua/i/programs">http://start.karazin.ua/i/programs</a> <a href="http://biology.karazin.ua/index-eng.html">http://biology.karazin.ua/index-eng.html</a>
<b>2 – Scope of the Educational Programme</b>	
Deepened fundamental, specialized and practical training of masters in biology.	
<b>3 – Description of the Educational Programme</b>	
<b>Subject area (branch of knowledge, specialty, specialization)</b>	09 “Biology” 091 “Biology”
<b>Orientation of Educational Programme</b>	Educational and Professional
<b>Main focus of Educational Programme and specialization</b>	<p>Deepened special education in specialty “Biology”. Study of general patterns of structure and function of biological systems of different organization levels, their interactions with the environment, reactions to various conditions, as well as at various stages of onto- and phylogenesis; study of biodiversity and evolution of living systems; of the importance of living organisms in biospheric processes, biotechnologies, economy, healthcare, environment protection and sustainable nature management.</p> <p>Mastering innovative approaches to solving theoretical and experimental problems in biology and related sciences, in order to investigate and assess biological systems state, to use them, monitor and evaluate environmental state with further implementation of the achievements into economy and social sphere.</p> <p><u>Key words:</u> biology, biochemistry, genetics, cytology, physiology of human and animals, bioecology, botany, zoology, animal ecology, plant physiology and biochemistry, microbiology, mycology, phytoimmunology, molecular biology, biotechnology.</p>

<b>Distinctive features</b>	The Programme is implemented in active research environment. contains the Research practice course and Diploma project with research in the area of specialization. The Programme contains the disciplines of fundamental, professional and practical training that have integrative features, the disciplines of psychology and teaching training and Teaching (lecturer assistant) practice course. The technologies of distance education are used.
<b>4 – Employability and further education</b>	
<b>Employability</b>	Professional activity in the area of biology, agriculture, medicine, biotechnology, nature conservation and sustainable management. Research Associate, lecturer in Higher education institution.
<b>Further education</b>	Right to continue study at the third educational scientific level of higher education. Acquiring of qualifications in other specialties in the system of postgraduate education.
<b>5 – Teaching and assessment</b>	
<b>Teaching and learning</b>	<p>Student centred, problem based learning, initiative self directed study. Lectures possess problem character and use analysis, synthesis, comparison, modeling, analogy, dialectics, abstraction, specification, systematic, historical and logical approaches.</p> <p>Laboratory and practical studies are carried out in small groups, envisage application of experimental research methods, statistical processing of experimental data, information and communication technologies.</p> <p>Educational and methodological support of individual learning is carried out through the use of elements of distance learning: electronic lectures, methodical instructions and tasks.</p> <p>The emphasis is made on personal self development, that contributes to the formation of the need and readiness to continue autonomous lifelong education.</p>
<b>Assessment</b>	<p>Current oral assessment, presentations of certain topics of theoretical course, essays, individual educational research assignments, reports on practice results.</p> <p>Students' learning achievements are assessed by 4-level (excellent, good, satisfactory, unsatisfactory) or 2-level national scale (passed, not passed). 100 mark system. Final attestation – public defense of Master's Research Project.</p>
<b>6 – Programme Competences</b>	
<b>Integral competence</b>	Ability to solve complex tasks and problems in the field of biological sciences and on the boundary between subject areas while supposing research and/or innovations implementation under ambiguous conditions and requirements.
<b>General competences (GC)</b>	<p>GC1. Possession of basic general knowledge in an amount sufficient to form a scientific outlook.</p> <p>GC2. Ability for abstract thinking, analysis and synthesis of information on the basis on scientifically valid facts and logical arguments in the field of biological sciences and on the boundary between subject areas.</p> <p>GC3. Ability to search for and analyze information from a variety of sources, including the results of own research.</p> <p>GC4. Possession of basic professional knowledge in an amount sufficient for independent work on specialty, as well as for lifelong learning new information and acquiring new skills and abilities.</p>

	<p>GC5. Ability to apply knowledge in practical situations, effectively solve practical tasks using professional knowledge.</p> <p>GC6. Research skills and abilities. Ability to identify promising areas of research, formulate purpose and objectives of research.</p> <p>GC7. Capacity to generate new ideas (creativity).</p> <p>GC8. Ability to use modern information technologies and analyze information in the field of biological sciences and on the boundary between subject areas.</p> <p>GC9. Ability to perform professional functions and undertake research at an appropriate level in the field of biological sciences and on the boundary between subject areas.</p> <p>GC10. Ability to act on the basis of moral and ethical reasoning in the professional field and the necessity of intellectual honesty, with social responsibility and awareness.</p> <p>GC11. Interpersonal skills and abilities. Capacity to work in a team and under supervision of a leader, ability to communicate in professional activities, including in an international context.</p> <p>GC12. Ability to making decisions autonomously and responsively under complex and unpredictable conditions that requires forecasting, analysis and synthesis, considering critical remarks and based on creative approach.</p>
<b>Professional competences of specialty (PC)</b>	<p>PC1. Knowledge of main contemporary provisions of fundamental sciences on origin, development, structure and function of living organisms, integrated understanding of organization of biological systems at different levels, ability to apply them to shape the worldview and interpret own research.</p> <p>PC2. Understanding fundamental biological concepts (adaptation, ontogenesis, evolution, etc.), ability to use them to interpret own research.</p> <p>PC3. Knowledge of modern scientific issues in the field of specialization and ability to analyze the directions of development of modern biology.</p> <p>PC4. Ability to use theoretical and methodological knowledge in the field of biological sciences and on the verge of subject areas, with the latest advances, for research and solution of applied problems.</p> <p>PC5. Ability to generate and experimentally verify original hypotheses on relationship of biological structure and function, mechanisms of biological processes and phenomena, causal relationships in nature.</p> <p>PC6. Ability to plan and carry out research, analyze and interpret their results, draw conclusions and prepare research manuscripts for publication.</p> <p>PC7. Ability to use biological databases and computer programs for the analysis of biological information.</p> <p>PC8. Skills of reasoned discussion and communication in the field of biological sciences and on the verge of subject areas.</p> <p>PC9. Ability to understand information from related fields of knowledge and to clarify specific professional issues to experts in other fields.</p> <p>PC10. Ability to promote biological knowledge, provide practical advice in the field of biological sciences, defend the scientific worldview.</p> <p>PC11. Ability to apply the foundations of pedagogy and psychology in</p>

	<p>the educational process in higher education institutions.</p> <p>PC12. Understanding career prospects, planning and managing career.</p> <p>PC13. Ability to solve inventive tasks in the field of biology or using biological effects.</p> <p>PC14. Ability to develop and manage projects, conduct patent searches and draw up patent documentation.</p> <p>PC15. Ability to assess impact of economic activities on the environment, human health and biodiversity, justify and apply measures of environmental management and biodiversity conservation.</p> <p>PC16. Ability to make decisions on important problems of biology and on the on the verge of subject areas on the basis of understanding of modern scientific facts, concepts, theories, principles and methods.</p> <p>PC17. Ability to formulate modeling tasks, create models of objects and processes in living organisms and their components using information technologies.</p> <p>PC18. Ability to perform work in compliance with the rules of biological ethics, biosafety, biosecurity.</p> <p>PC19. Ability to conduct research and conduct teaching in accordance with the standards of academic integrity.</p> <p>PC20. Understanding of the basic principles and international practices of business administration of research activities.</p>
<b>7 – Programme Learning Outcomes (LO)</b>	
	<p>LO1. Be able to communicate in dialogue with colleagues and target audience.</p> <p>LO2. Use libraries, databases, internet resources to find the necessary information.</p> <p>LO3. Find ways to fast and effective solutions of problems, generate ideas, using knowledge and skills acquired.</p> <p>LO4. Present results of scientific work in writing (in the form of report, scientific publications, etc.) and orally (in the form of presentations and report defense) using up-to-date technologies, conduct discussion correctly.</p> <p>LO5. Identify own contribution, carry out coordinated work on the result, taking into account social, civil and industrial interests.</p> <p>LO6. Know the basic rules of biological ethics, biosecurity, biosafety, basic approaches to risk assessment using the latest biological, biotechnological and medical-biological methods and technologies.</p> <p>LO7. Follow the rules of academic integrity while studying and conducting research activities in order to ensure confidence in the results of scientific work; know basic legal categories and peculiarities of implementing results of intellectual activity.</p> <p>LO8. Be able to identify potentially hazardous production processes that can create a threat of emergencies; comply with rules of safety.</p> <p>LO9. Know the features of modern biological science, the basic methodological principles of scientific research, methodological and methodical tools for carrying out scientific research in specialization.</p> <p>LO10. Be able to model the basic processes of research to select research methods, instruments or to develop new techniques.</p> <p>LO11. Be able to conduct statistical processing, analysis and generalization of experimental data using software and information technologies applicable in the field of biology.</p>

	<p>LO12. Know and analyze the principles of structural and functional organization, mechanisms of regulation and adaptation of organisms.</p> <p>LO13. Demonstrate and use knowledge of the basic patterns of formation, quantitative assessment and conservation strategies of biodiversity, increase of productivity and sustainability of agroecosystems and natural ecosystems.</p> <p>LO14. Use innovative approaches to solve specific biological problems.</p> <p>LO15. Know the main requirements of current legislation of Ukraine on the use of biological resources. Use regulations, normative and technical documentation in the field of scientific activity.</p> <p>LO16. Know the principles of developing an algorithm and conducting research and search activity by specialization.</p> <p>LO17. Apply the acquired knowledge in specialization to solve specific practical problems.</p> <p>LO18. Apply pedagogical technologies at the level sufficient for implementation of designed programs of educational disciplines by specialization in higher educational institutions.</p> <p>LO19. Model objects and processes in living organisms and their components using information technologies.</p> <p>LO20. Demonstrate and use integrated current understanding of the principles of structural and functional organization of biological systems of different taxonomic affiliation, their phylogeny and ontogeny.</p> <p>LO21. Master the techniques of laboratory and field research of biological objects using appropriate equipment; methods of observation, description, identification, analysis, classification and cultivation of biological objects; methods of mathematical and statistical processing of the results of biological research.</p> <p>LO22. Be able to provide professional advice in the field of biology.</p> <p>LO23. Be able to popularize biological knowledge and defend the scientific outlook.</p> <p>LO24. Understand the main principles of the functioning of the international scientific community: the principles of reviewing manuscripts of publications, measuring scientific and economic indices, organizing international cooperation, submitting applications for grants and the principles for their selection.</p> <p>LO25. Be able to independently and responsibly make decisions in complex and unpredictable conditions that require forecasting, based on analysis and synthesis, taking into account critical remarks and on the basis of creative approach.</p>
<b>8 – Resource support for Programme implementation</b>	
<b>Personnel staffing</b>	<p>Guarantor of the Educational Programme: Vasyl Vasyliovych Zhmurko - Dean of the School of Biology of V.N. Karazin Kharkiv National University, Dr. of biological science, Professor. Scientific and pedagogical staff with academic degrees and / or academic degrees, as well as highly skilled specialists, are involved in the programme realization. In order to raise the professional level, all scientific and pedagogical workers undergo an internship once in five years, including overseas. Lectures, seminars, round tables, workshops with specially invited foreign specialists are held.</p>
<b>Material and technical</b>	<p>Educational campus includes auditoriums and thematic rooms with</p>

<b>support</b>	multimedia equipment, specialized equipped teaching and research laboratories of the chairs (Laboratory of cell culture and animal tissue, Laboratory of cell biochemistry and molecular genetics, Laboratory of bioinformatics, Molecular genetic laboratory, Laboratory of callus cultures "Morphogenesis in vitro", Laboratory of microbiology and microbiological box, Laboratory of aquaculture with a collection of algae cultures, Laboratory for pure cultures of fungi, Laboratory Laboratory of invertebrate taxonomy, Laboratory of genetics of vertebrate, Laboratory of genetics of ontogenesis, Collection of Drosophil lines (National Heritage of Ukraine), Scientific Herbarium of CWU (National Heritage of Ukraine), Scientific Mycological Herbarium of CWU-Myc (Laboratory of Parasitology), Laboratory of parasitology, Laboratory of waterborne organisms. National heritage of Ukraine), Algoteka - collection of samples of algae), computer classes with access to the Internet. Various collections of biological objects are used in educational and scientific activities. Some lessons are held on the base of the botanical garden and the Nature Museum. Field studies can be conducted in natural habitats. There is an opportunity to perform qualification works both on the basis of the university and on the basis of specialized laboratories in the partner institutions (under the terms of the contract). Applicants for higher education are provided with dormitories. There is a sports hall, sports grounds, various sports sections and cultural centers. The meals offer a high quality menu, including the Halal Certificate.
<b>Information, teaching and methodical support</b>	The official website of the V.N. Karazin Kharkov National University: <a href="http://www.univer.kharkov.ua/">http://www.univer.kharkov.ua/</a> ; wireless points of access to the Internet; unlimited internet access; scientific library, reading rooms; virtual learning environment Moodle; corporate mail; training and work plans; curricula of the educational process; educational-methodical complexes of disciplines; training and work programs of disciplines; didactic materials for independent and individual work of students from disciplines; practice programs; methodical instructions for the implementation of individual tasks, control and diploma papers; criteria for assessing the level of training; packages of complex control works.
<b>9 – Academic mobility</b>	
<b>National Credit Mobility</b>	Applicants of higher education can realize the right for academic mobility in higher educational institutions and scientific institutions of Ukraine on the basis of agreements and on their own initiative on the basis of an individual invitation.
<b>International Credit Mobility</b>	Erasmus Mundus, DAAD German Academic Exchange Program, Fulbright Fellowship Program, Open Society Institute Programs (Washington), etc., as well as individual invitations from higher education institutions and research institutions outside of Ukraine.
<b>Teaching of foreign students</b>	Foreign citizens study on a paid basis (on a contract basis) at the expense of individuals and legal entities. All other conditions are regulated by the Admission Rules of the University.



## 2. The list of components of the Educational Programme and their logical consistency

### 2.1. The list of components of the Educational Programme (EP)

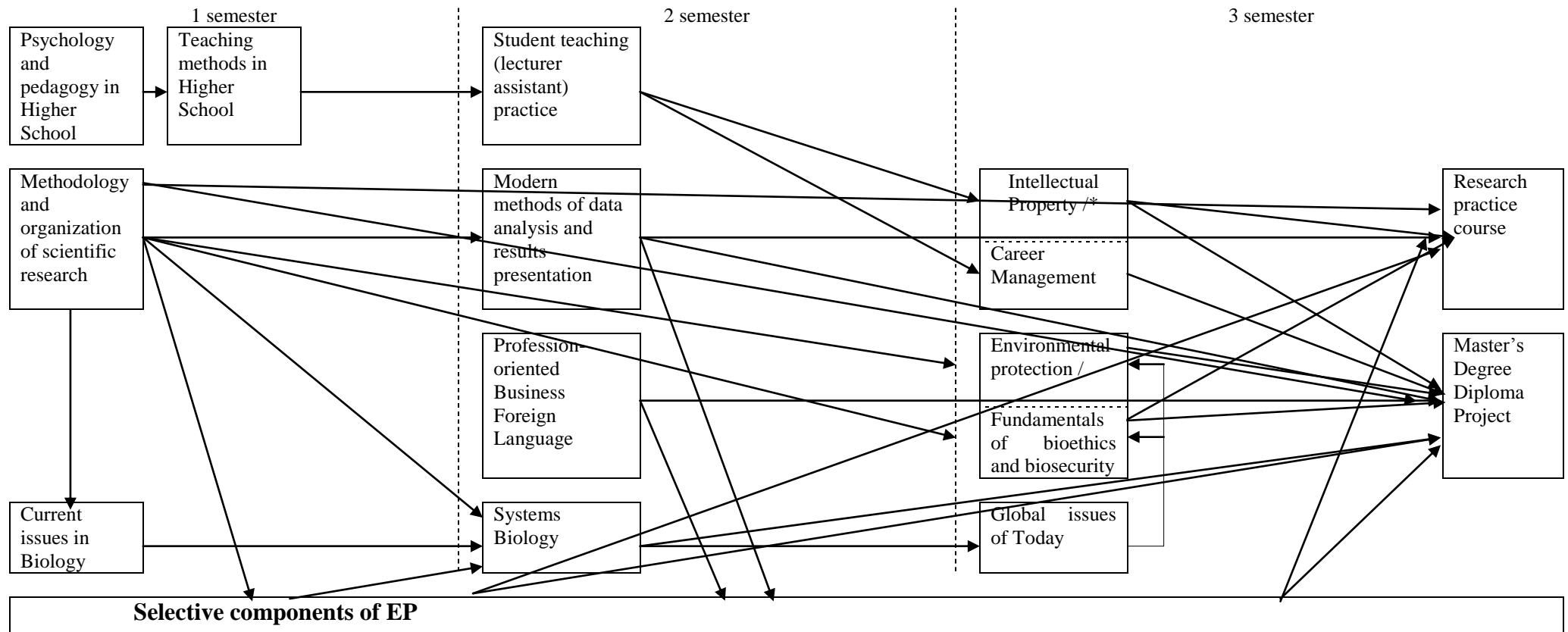
Code	Components of the Educational Programme (educational disciplines, course projects (work), practice courses, qualification work)	Amount of ECTS credits	Form of final assessment
1	2	3	4
<b>Obligatory components of EP</b>			
CC 1.	Methodology and Organization of Scientific Research	4	exam
CC 2.	Teaching methods in Higher School	4	credit
CC 3.	Psychology and Pedagogy in Higher School	3	credit
CC 4.	Systems Biology	5	exam
CC 5.	Profession-oriented Foreign Language	4	credit
CC 6.	Current issues in Biology	5	exam
CC 7.	Modern Methods of Data Analysis and Results Presentation	4	credit
CC 8.	Teaching (assistant) Practice course	7	credit
CC 9.	Global issues of Today	3	credit
CC 10/11.	Intellectual Property / Career Management	3	credit
CC 12/13.	Nature Conservation / Fundamentals of Bioethics and Biosafety	3	credit
CC 14.	Master's Degree Diploma Project	12	defense
CC 15.	Research Practice course	6	credit
<b>Total amount of ECTS credits for obligatory components:</b>		<b>63</b>	
<b>Elective components of EP</b>			
<i>Selective block 1 (Bioecology and botany)</i>			
SC 1.1.	Adaptogenesis in biological systems	4	exam
SC 1.2.	Phytocenology	3	exam
SC 1.3.	Phytosozology	4	exam
SC 1.4.	Design and GIS-analysis of ecosystems services	4	exam
SC 1.5.	Lichenology	4	credit
SC 1.6.	Biochemical ecology	5	credit
SC 1.7.	Ecological management	3	exam
<i>Selective block 2 (Zoology and animal ecology)</i>			
SC 2.1.	Molecular evolution	4	exam
SC 2.2.	Population biology	3	exam
SC 2.3.	Conservation biology	4	exam
SC 2.4.	Zoogeography	4	exam
SC 2.5.	Modeling of complex systems in biology	4	credit
SC 2.6.	Ecology of arthropods	5	credit
SC 2.7.	Polar biology	3	exam

1	2	3	4
<i>Selective block 3 (Mycology and phytoimmunology)</i>			
SC 3.1.	Methods of multidimensional analysis in mycology	4	exam
SC 3.2.	Fungal physiology	3	exam
SC 3.3.	Microbiological toxicology	4	exam
SC 3.4.	Molecular methods in mycology	4	exam
SC 3.5.	Methods of fungal taxonomy	4	credit
SC 3.6.	Fungal cytomorphology	5	credit
SC 3.7.	International cooperation and fundraising in mycology	3	exam
<i>Selective block 4 (Molecular biology and biotechnology)</i>			
SC 4.1/4.2.	Business planning for obtaining targeted biotechnology products / Control and management of biotechnological processes	4	exam
SC 4.3/4.4.	Immunobiotechnology and obtaining clones of animals and plants / Engineering and computer graphics	3	exam
SC 4.5/4.6.	Obtaining and use of callus cultures / Design and use of biosensors	4	exam
SC 4.7/4.8.	Risks and biosafety of modern biotechnologies / Epigenetic inheritance mechanisms	4	exam
SC 4.9/4.10.	Culture of animal and plant cells / Stem cells: isolation and medical application	4	credit
SC 4.11/4.12.	Quality assessment of biotechnological products / Environmental monitoring, bioassay and bioindication	5	credit
SC 4.13/4.14.	Engineering Enzymology / Membrane Technologies	3	exam
<i>Selective block 5 (Plant physiology and biochemistry)</i>			
SC 5.1.	Plant gene engineering	4	exam
SC 5.2.	Modern phytohormonology	3	exam
SC 5.3.	Photosynthesis and production process	4	exam
SC 5.4.	Systematic regulation of plant ontogenesis	4	exam
SC 5.5.	Molecular biology methods in plant and microbial physiology research	4	credit
SC 5.6.	Methods of metabolomics, proteomics and signaling in plant physiology and microbiology	5	credit
SC 5.7.	Plant symbiogenetics	3	exam
<i>Selective block 6 (Microbiology and virusology)</i>			
SC 6.1.	Theoretical and applied gene engineering of microorganisms	4	exam
SC 6.2.	Antibiotics	3	exam
SC 6.3.	Biological bases of infectious processes	4	exam
SC 6.4.	Industrial microbiology	4	exam
SC 6.5.	Molecular biology methods in plant and microbial physiology research	4	credit
SC 6.6.	Methods of metabolomics, proteomics and signaling in plant physiology and microbiology	5	credit
SC 6.7.	Mechanisms of plant-microbe interaction	3	exam
<b>Total amount of ECTS credits for selective components:</b>		<b>27</b>	

1	2	3	4
<i>Optional disciplines</i>			
O1.	DNA-barcoding		
O2.	Mechanisms of ontogenesis		
O3.	Historical development of biological systems		
<b>Curriculum volume</b>		<b>90 ECTS credits</b>	

## 2.2. Structural logic scheme of EP

### Obligatory components of EP



### **3. Form of attestation of graduates**

Attestation of graduates of Educational Programme on specialty 091 Biology is carried out in the form of defense of the qualifying Master's Research Project and results in awarding a Master's degree (with certified document of the government-approved format) with the qualification: Master of Biology. Biologist.

The attestation is carried out openly and publicly.

***Qualification Project should meet the requirements:***

- should provide the solution of a theoretical or practical problem with the application of fundamental provisions and methods of system analysis, be characterized by complexity and uncertainty of the conditions;
- should contain an analysis of the current state of the problem being solved, and the working hypothesis;
- must describe the methods used and the results obtained;
- should contain analysis and theoretical substantiation of the research results;
- must be written in scientific style, in English;
- must be tested for plagiarism;
- the abstract of the thesis should be hosted on the site of the higher educational institution.

#### 4. Correspondence matrix of Educational Programme competences and components

	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	SC 1.1	SC 1.2	SC 1.3	SC 1.4	SC 1.5	SC 1.6	SC 1.7	SC 2.1	SC 2.2	SC 2.3	SC 2.4	SC 2.5	SC 2.6	SC 2.7	SC 3.1	SC 3.2	SC 3.3	SC 3.4	SC 3.5	SC 3.6	SC 3.7		
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## 5. Matrix of implementation of Educational Programme learning outcomes (LO) by corresponding components

	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	SC 1.1	SC 1.2	SC 1.3	SC 1.4	SC 1.5	SC 1.6	SC 1.7	SC 2.1	SC 2.2	SC 2.3	SC 2.4	SC 2.5	SC 2.6	SC 2.7	SC 3.1	SC 3.2	SC 3.3	SC 3.4	SC 3.5	SC 3.6	SC 3.7		
LO 1		•	•		•			•																													•	
LO 2				•															•								•				•							
LO 3										•																												
LO 4		•	•		•			•																													•	
LO 5											•	•	•					•								•												
LO 6											•	•	•	•				•	•							•	•											
LO 7											•	•	•					•								•												
LO 8							•													•									•					•	•			
LO 9	•						•	•						•	•		•							•	•													
LO 10	•						•	•						•	•		•							•	•													
LO 11	•						•							•	•		•							•														
LO 12				•		•			•							•					•		•				•					•				•		
LO 13				•		•	•		•							•				•	•		•			•		•				•		•	•	•		
LO 14										•																												
LO 15											•											•								•			•					
LO 16	•						•							•	•		•						•															
LO 17							•													•					•				•					•	•			
LO 18		•	•		•			•																													•	
LO 19				•															•								•				•							
LO 20				•		•			•							•					•		•			•		•				•				•		
LO 21	•						•							•	•		•								•											•		
LO 22		•	•		•			•																													•	
LO 23		•	•		•			•																													•	
LO 24	•	•	•		•			•																													•	
LO 25											•											•							•				•					



	SC 4.1	SC 4.2	SC 4.3	SC 4.4	SC 4.5	SC 4.6	SC 4.7	SC 4.8	SC 4.9	SC 4.10	SC 4.11	SC 4.12	SC 4.13	SC 4.14	SC 5.1	SC 5.2	SC 5.3	SC 5.4	SC 5.5	SC 5.6	SC 5.7	SC 6.1	SC 6.2	SC 6.3	SC 6.4	SC 6.5	SC 6.6	SC 6.7
LO 1	•																											
LO 2				•																•								•
LO 3																												
LO 4	•																											
LO 5							•				•	•																
LO 6							•				•	•	•															
LO 7							•				•	•																
LO 8															•				•			•				•		
LO 9		•			•	•			•	•			•	•														
LO 10		•			•	•			•	•			•	•														
LO 11		•			•	•			•	•			•	•														
LO 12								•								•	•	•	•			•			•			•
LO 13								•							•	•	•	•	•		•	•			•		•	•
LO 14																•	•	•	•			•						
LO 15	•																						•		•			
LO 16		•			•	•			•	•			•	•														
LO 17															•				•			•				•		
LO 18	•																											
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LO 25		•																					•		•			