

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

APPROVED

Minutes No. 11 dated May 22, 2025

of the meeting of the Academic Council of NULES of Ukraine

Rector: Vadym TKACHUK

The educational and scientific program
comes into effect on September 1, 2025

EDUCATIONAL AND SCIENTIFIC PROGRAM

"Biotechnologies of Biological Systems"

for the preparation of higher education applicants at the third (educational-scientific) level of
higher education

in Specialty **E1 "Biology and Biochemistry"**

Field of Knowledge **E "Natural Sciences, Mathematics and Statistics"**

Qualification: **Doctor of Philosophy in Biology**

Kyiv - 2025

APPROVAL SHEET

of the educational and scientific program

Biotechnologies of Biological Systems

- **Vice-Rector for Scientific Work and Innovation Activity:** Oksana TONKHA
- **Head of the Department of Postgraduate, Doctoral Studies and Certification of Scientific Personnel:** Serhiy BOYARCHUK
- **Dean of the Faculty of Plant Protection, Biotechnology and Ecology:** Yuliya KOLOMIYETS
- **Program Guarantor:** Svitlana PRYLUTSKA

FOREWORD

The Educational and Scientific Program (ESP) "Biotechnologies of Biological Systems" for the training of higher education applicants at the third (educational-scientific) level in specialty E1 "Biology and Biochemistry" contains an workload of 55 ECTS credits required to obtain the corresponding higher education degree; the list of graduate competencies; the normative content of training higher education applicants formulated in terms of learning outcomes; forms of assessment of higher education applicants; and requirements for the internal quality assurance system of higher education.

Developed by the project group consisting of:

1. **Svitlana Volodymyrivna Prylutska**, Doctor of Biological Sciences, Professor, Head of the Department of Physiology, Plant Biochemistry and Bioenergetics.
2. **Yuliya Vasylivna Kolomiyets**, Doctor of Agricultural Sciences, Professor, Dean of the Faculty of Plant Protection, Biotechnology and Ecology.
3. **Olena Yuriyivna Kvasko**, Candidate of Biological Sciences, Associate Professor, Head of the Department of Ecobiotechnology and Biodiversity.
4. **Alla Ivanivna Yemets**, Corresponding Member of the National Academy of Sciences of Ukraine, Doctor of Biological Sciences, Professor, Head of the Department of Cell Biology and Biotechnology, State Institution "Institute of Food Biotechnology and Genomics of the National Academy of Sciences of Ukraine".
5. **Nataliya Mykolaivna Serhiychuk**, applicant of the third (educational-scientific) level of higher education.

Review-feedbacks from external stakeholders (if available):

1. **Olena Serhiyivna Demyanyuk**, Doctor of Agricultural Sciences, Professor, Corresponding Member of the National Academy of Agrarian Sciences of Ukraine, Deputy Director for Scientific Work of the Institute of Agroecology and Environmental Management of Ukraine.
2. **Hanna Mykolaivna Tkalenko**, Doctor of Agricultural Sciences, Senior Researcher, Deputy Director of the Institute of Plant Protection of the National Academy of Agrarian Sciences of Ukraine.
3. **Svitlana Heorhiyivna Korsun**, Doctor of Agricultural Sciences, Senior Researcher, Executive Director of LLC "Institute of Applied Biotechnology".

1. Profile of the Educational and Scientific Program "Biotechnologies of Biological Systems"

1 - General Information

Full name of the higher educational institution and structural subdivision

National University of Life and Environmental Sciences of Ukraine.
Faculty of Plant Protection, Biotechnology and Ecology.

Higher education degree and title of qualification in the original language

Degree: Doctor of Philosophy
Qualification: Doctor of Philosophy in Biology

Official name of the educational-scientific program	Biotechnologies of Biological Systems
Type of diploma and scope of the educational-professional program	Doctor of Philosophy diploma, single. Educational component: 55 ECTS credits, study period 4 years. Scientific component: involves conducting independent scientific research and formalizing its results in the form of a dissertation.
Availability of accreditation	Accredited for the first time, National Agency for Higher Education Quality Assurance, 2026.
Cycle/Level	NQF of Ukraine – Level 8, QF-EHEA – Third Cycle, EQF-LLL – Level 8
Prerequisites	Admission conditions are determined by the "Rules of Admission to Postgraduate Studies of the National University of Life and Environmental Sciences of Ukraine", approved by the Academic Council of NULES of Ukraine. Requirement of a Master's degree. Training is conducted in full-time (day) and part-time forms of study.
Language(s) of instruction	Ukrainian
Validity period of the educational-professional program	Until the next accreditation.
Internet address of the permanent placement of the description	nubip.edu.ua

2 - Objective of the Educational-Professional Program

The objective of this educational-professional program is to train highly qualified specialists in the field of biotechnology to solve complex problems at the level of biological systems. This involves a profound rethinking of existing and the formulation of new competencies regarding the principles of modifying current and creating cutting-edge biotechnologies in various fields of industry, as well as conducting research and innovation activities.

3 - Characteristics of the Educational-Professional Program

Subject area (field of knowledge, specialty)

Orientation of the educational-scientific program

Main focus of the educational-scientific program

Special focus:

Features of the educational-scientific program

4 - Suitability of Graduates for Employment and Further Education

Employment suitability

Further education

5 - Teaching and Assessment

Teaching and learning

Assessment

6 - Program Competencies

Integral Competence

General Competencies (GC)

Special (Professional, Subject) Competencies (SC)

7 - Program Learning Outcomes

Learning Outcomes (LO)

8 - Resource Support for Program Implementation

Staffing support

Material and technical support

Information and educational-methodological support

9 - Academic Mobility

National credit mobility

International credit mobility

Training of foreign higher education applicants

2. List of Components of the Educational and Scientific Program "Biotechnologies of Biological Systems" and Their Logical Sequence

2.1. List of ESP Components

Discipline Code	Components of the Educational and Scientific Program (educational disciplines, course projects (works), practices, qualification work)	Number of Credits	Form of Final Control
1.	COMPULSORY COMPONENTS OF THE ESP		
1.1.	Cycle of General Scientific Training		
OK 1.	Philosophy of Science	4	Exam
OK 2.	Foreign Language for Professional Purposes	6	Exam
OK 3.	Pedagogy and Management of Higher Education Institutions	4	Exam
1.2.	Components of Special (Professional) Training		
OK 4.	Objects of Biological Systems	4	Exam
OK 5.	Mathematical Modeling and Experiment Planning	4	Exam
OK 6.	Research Methodology and Organization of Dissertation Preparation	5	Exam
OK 7.	Modern Biotechnological Research Methods	5	Exam
OK 8.	Innovative Methods for Assessing Plant Health	4	Exam
OK 9.	Pedagogical (Assistant) Practice	4	Credit (Pass/Fail)
Total Workload of Compulsory Components		40	
ELECTIVE COMPONENTS OF THE ESP			
VK 1.	Professional Elective Discipline 1	5	Exam
VK 2.	Professional Elective Discipline 2	5	Exam
VK 3.	Professional Elective Discipline 3	5	Exam
Total Workload of Elective Components		15	
TOTAL WORKLOAD OF THE PROGRAM		55	

List of Professional Elective Disciplines (VK 1 - VK 3)

1. Genomics and Proteomics

2. Cellular Biotechnology
 3. Molecular Diagnostics
 4. Environmental Biotechnology
 5. Plant Biochemistry
 6. Biotechnologies and Genetic Engineering
 7. Ecological Plant Physiology
 8. Metagenomics and Biomimetics of Microorganisms
 9. Agrobiotechnologies
 10. Industrial Technologies for Obtaining Microbial Metabolites
 11. Microbiology and Virology
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2.2. Structural and Logical Scheme of Training Applicants for the Educational and Scientific Program "Biotechnologies of Biological Systems"

[1st Year of Study]

- └— OK1 Philosophy of Science
- └— OK2 Foreign Language for Professional Purposes
- └— OK3 Pedagogy and Management of Higher Education Institutions

[2nd Year of Study]

- └— VK1 - Professional Elective Discipline 1
- └— VK2 - Professional Elective Discipline 2
- └— VK3 - Professional Elective Discipline 3
- └— OK4 Objects of Biological Systems
- └— OK5 Mathematical Modeling and Experiment Planning
- └— OK6 Research Methodology and Organization of Dissertation Preparation
- └— OK7 Modern Biotechnological Research Methods
- └— OK8 Innovative Methods for Assessing Plant Health

[3rd Year of Study]

└─ OK9 Pedagogical (Assistant) Practice

[4th Year of Study]

└─ Preparation and Defense of the Dissertation Work

Conducting Dissertation Research (Ongoing across years):

- Conducting research on the topic of the dissertation work, preparation, and publication of scientific articles (the number of which is stipulated by relevant regulatory legal acts), monographs, scientific and methodological recommendations, conference abstracts;
- Participation in the execution of budget-funded, contractual, and initiative scientific research works (topics);
- Approbation of dissertation research results at conferences, seminars, forums;
- Implementation of research results into production and the educational process.

3. Form of Assessment of Higher Education Applicants

Assessment of higher education applicants at the Doctor of Philosophy educational level is carried out in the form of a public defense of the dissertation work. A mandatory condition for admission to the defense is the successful fulfillment of the applicant's individual curriculum.

A dissertation for the degree of Doctor of Philosophy is an independent, detailed study that proposes a solution to an urgent scientific problem in the field of biology or at its intersection with related fields, the results of which constitute an original contribution to the general sum of biological knowledge and are published in relevant publications.

The dissertation work must not contain academic plagiarism, falsification, or fabrication.

The dissertation work must be posted on the website of the higher education institution (scientific institution).

The dissertation work must comply with other requirements established by legislation.

The defense of the dissertation work is carried out openly and publicly.

4. Matrix of Correspondence of Program Competencies to Components of the Educational and Scientific Program "Biotechnologies of Biological Systems"

	OK 1	OK 2	OK 3	OK 4	OK 5	OK 6	OK 7	OK 8	OK 9	VK 1	VK 2	VK 3
IC	+	+	+	+	+	+	+	+	+	+	+	+
GC01			+				+			+	+	+
GC02		+				+						
GC03		+		+		+						
GC04	+		+					+				
GC05				+	+							
GC06			+					+				
SC01		+	+		+			+	+	+	+	+
SC02				+			+					
SC03			+					+				
SC04						+	+		+	+	+	+
SC05					+	+	+					
SC06				+				+				
SC07	+	+	+									
SC08						+	+		+	+	+	+
SC09						+	+		+	+	+	+

(Note: IC = Integral Competence)

5. Matrix of Ensuring Program Learning Outcomes (LO) by Corresponding Components of the Educational and Scientific Program "Biotechnologies of Biological Systems"

	OK 1	OK 2	OK 3	OK 4	OK 5	OK 6	OK 7	OK 8	OK 9	VK 1	VK 2	VK 3
LO01	+	+	+	+	+	+	+	+	+	+	+	+
LO02		+		+	+	+	+	+				
LO03		+		+	+	+	+	+	+	+	+	+
LO04				+	+	+	+	+	+	+	+	+
LO05	+	+		+	+	+	+	+	+	+	+	+
LO06		+		+	+	+	+	+	+	+	+	+
LO07	+		+	+	+	+	+	+	+	+	+	+
LO08		+	+	+		+	+	+	+			
LO09				+			+	+		+	+	+