

**НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ БІОРЕСУРСІВ І  
ПРИРОДОКОРИСТУВАННЯ УКРАЇНИ**

Кафедра екології агросфери та екологічного контролю


**«ЗАТВЕРДЖЕНО»**

Декан факультету захисту рослин,  
біотехнологій та екології


“” Коломієць Ю.В.  
“” 2023р.

**«СХВАЛЕНО»**

на засіданні кафедри екології  
агросфери та екологічного контролю  
Протокол № 5 від “03” 05 2023 р.

 Завідувач кафедри  
(Наумовська О.І.)

**«РОЗГЛЯНУТО»**

 Гарант ОП 101 «Екологія»  
(В.М. Боголюбов)

**РОБОЧА ПРОГРАМА НАВЧАЛЬНОЇ ДИСЦИПЛІНИ**

**“Біорізноманіття і його збереження”**

(шифр і назва навчальної дисципліни)

Спеціальність: 101 «Екологія»

Освітній ступінь: «Бакалавр»

Освітня програма: «Екологія»  
(назва ОП)

Факультет: захисту рослин, біотехнологій та екології  
(назва)

Розробник: Вагалюк., к.с.-г.н., доцент,  
(посада, науковий ступінь, вчене звання)

Київ – 2023 рік

**1. Description of the discipline**  
**«Biodiversity and conservation»**

Field of knowledge, specialty, educational program, educational degree		
Educational degree	Bachelor	
Specialty	101 "Ecology"	
Educational program	«Ecology»	
Characteristics of the discipline		
Kind of the discipline	Obligatory	
Total number of hours	120	
Amount of credit ECTS	4	
Number of content modules	2	
Course project (work) for availability)	-	
Form of control	Exam	
Indicators of academic discipline for full-time and part-time forms of education		
	full-time	part-time
Year of preparation (course)	3	3
Semester	5	5
Lectures	30	8
Practical, seminar classes	30	12
Laboratory classes	-	-
Individual work	60	130
Number of weekly classrooms hours for full-time study	4	

## 2. The purpose and objectives of the discipline

The purpose of the course "*Biodiversity and conservation*" is to acquaint students with the principles of using biological knowledge and mastering the methodology of quantitative and qualitative assessment of biodiversity, mastering the techniques of modern ecosystem analysis, which are basic in studying population and interpopulation relationships.

The **task** of the course is to study the main principles of modern ecology and biology, the evolution of living organisms in the biosphere, environmental problems of today and ways to solve them. An integral part of the course is the study of some important systematic groups of organisms in connection with the role that the latter play in natural and artificial ecosystems.

As a result of studying the discipline the student **must know**:

- principles of modern instrumental methods of research of biological objects and environment;
  - principles of evolution and speciation;
  - principles and methods of diversity assessment;
  - basic ideas about the theoretical foundations of ecology and environmental protection;
  - natural functions of biodiversity;
  - the value of biodiversity for humans (intrinsic value of biodiversity);
  - principles of rational use of biological resources;
  - principles of ecological stability, economic and social component of the latter;
  - basics of safety in field and laboratory research;
- 
- **be able to**: - apply environmental research methods in solving typical professional problems;
  - apply methods of search and exchange of information in global and local computer networks;
  - to characterize the vegetation at the level of phytocenoses;
  - fill in the forms of geobotanical description;
  - provide characteristics of the plant community;
  - provide characteristics of plants in tiers;
  - take into account the nature of anthropogenic impacts;
  - collect population and demographic data;
  - to do primary processing of the collected material;
  - use tools and devices in the process of scientific research and practical work;
  - carry out a step-by-step analysis of geobotanical data.

### Acquisition of competencies:

1. *Integral competence (IC)*: The ability to generate new ideas, solve complex problems in the field of ecology, environmental protection and sustainable use of natural resources in the implementation of research and innovation activities.

#### 2. *Special (professional) competencies (SC)*

SC1. Knowledge and understanding of the theoretical foundations of ecology, environmental protection and sustainable use of natural resources.

SC8. Ability to justify the need to preserve landscape and biological diversity, the formation of an ecological network and develop measures aimed at their conservation.

#### 3. *Programmatic learning outcomes (PLOs)*:

PLO3. Understand the basic concepts, theoretical and practical problems in the field of natural sciences necessary for analysis and decision-making in the field of ecology, environmental protection and sustainable use of natural resources.

PLO6. Identify factors that ensure the formation of landscape and biological diversity.

### 3. The structure of the discipline

Names of content modules and topics	Number of hours									
	full-time					part-time				
	total	including				total	including			
		l.	p.	lab.	ind.		l.	p.	lab.	ind.
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
<b>Module 1. Basic of biodiversity</b>										
Lecture 1. Biodiversity. Introduction and definition	10	2	2	-	6	11	2	-	2	7
Lecture 2. Biodiversity levels of organization	10	2	2	-	6	9		-	2	7
Lecture 3. Natural and artificial biocenoses. Biocoenoses - examples	12	3	3	-	6	10	2	-	2	6
Lecture 4. Threats to biodiversity	14	4	4	-	6	10	2	-	2	6
Lecture 5. Conservation biodiversity	14	4	4	-	6	6		-		6
Total for the module 1	60	15	15	-	30	46	6	-	8	32
<b>Module 2. Characteristics and assessment of threats to biodiversity</b>										
Lecture 1. Connectivity: ecological corridors are key to protecting biodiversity	10	2	2	-	6	11	2	-	2	7
Lecture 2. Protect River Corridors and Floodplains	10	2	2	-	6	9		-	2	7
Lecture 3. Conservation of biodiversity in agricultural landscapes	12	3	3	-	6	7				7
Lecture 4. General approaches to assessing and reducing threats to biodiversity	14	4	4	-	6	7				7
Lecture 5. Ecosystem functions of biodiversity and ecological concept of nature management	14	4	4	-	6	6				6
Total for the module 2	60	15	15	-	30	40		-	4	32
<b>Total</b>	120	30	30	-	60	86	8	-	12	66

#### 4. Topics of practical classes

№	Name topics	Number hours
	<b>Module 1. Basic of biodiversity</b>	
1	Biodiversity as an objective factor in assessing the state of the environment and the stability of ecosystems	2
2	Biodiversity of Ukraine and principles of protection	2
3	The main causes of biodiversity loss	3
4	Footprint and assessment	4
5	Rare and endangered species of flora and fauna in Ukraine	4
	<b>Module 2. Characteristics and assessment of threats to biodiversity</b>	
6	The main provisions of environmental legislation in the field of biotic and landscape diversity	2
7	Study of the structure of the state cadastre of flora in Ukraine	2
8	Status and prospects of development of the protected area in Ukraine	3
9	Criteria for the formation of the ecological network in Ukraine	4
10	Determining the amount of damage caused by the illegal destruction of wild animals	4
	<b>Total</b>	30

#### 5. Topics of laboratory classes

№	Name topics	Number hours
1	Not provided for in the curriculum	
2		
...		

#### 6. Individual work

Independent work of students is a necessary element of learning the educational material. Students are offered the following types of independent work:

1. Study of lecture material.
2. Study of the recommended literature and search for additional literature.
3. Mastering the basic terms and concepts on the topics of the module.
4. Preparation for seminars and discussions.
5. Preparation of an essay on the recommended topic. The list of topics is given below.

The student chooses the topic for the essay on the disciplines independently or on the recommendation of the teacher. The essay should consist of the following subsections:

- ✓ introduction - the topic, purpose and objectives of the work and its main provisions are indicated; volume - 1 - 2 paragraphs;
- ✓ Literary review - the student must state the main provisions of the essay topic, given in the latest literary publications; volume - 1 page;
- ✓ main results of the work - this section contains statistical or qualitative results of the work, diagrams, drawings, models, systematized reference information, a certain analysis of the work, etc;
- ✓ conclusions and recommendations - the results of the analysis of the research conducted on the topic of the essay should be presented; proposals and recommendations obtained in the

essay, conclusions on the practical use of the results obtained should be set forth;

- ✓ a list of references - all used literary sources should be cited. The list is compiled in a certain order (laws of Ukraine, presidential decrees, resolutions of the Verkhovna Rada and the Cabinet of Ministers, statistical reference books, general and specialized literature in alphabetical order). Data on the sources indicated in the list must be given in accordance with the requirements of the state standard. The student should use literary sources of recent years of publication (not older than 5 years). Depending on the topic of the essay, the list of references should contain at least 5 references. The highest priority literary sources should be scientific articles and monographs. It is allowed to use sources from the Internet, but only official websites of state or public institutions, official electronic publications.
- ✓ The volume of the essay should be 5-6 pages in the printed version.
- ✓ The essay should be formatted according to the normative rules for the design of text, tables, formulas, calculations, diagrams, and drawings.

#### *Recommended essay topics*

1. The concept of sustainable development.
2. The content of the concept of "sustainable development".
3. The concept of biodiversity.
4. The main causes of biodiversity loss.
5. Conservation of biodiversity.
6. Problems of biodiversity conservation.
7. Conservation of biological diversity.
8. Indicators of the state of biodiversity in Ukraine.
9. Economic valuation of biodiversity.
10. Adaptation of animals to the environment.
11. Plant species included in the Red Book of Ukraine.
12. Species of animals listed in the Red Book of Ukraine.
13. The concept of "endangered species".
14. Normative and legislative documents regulating the state of biodiversity in Ukraine.
15. The content of the Convention on Biological Diversity.

#### **7. Teaching methods**

During the study of the discipline, explanatory and illustrative, research methods are used with the involvement of regulatory documents, visual equipment, computer programs with appropriate software, visual stands, catalogs of regulatory documents, Laws of Ukraine, etc.

#### **8. Forms of training**

Types and forms of control are regulated by the Regulations on Examinations and Tests at the National University of Life and Environmental Sciences of Ukraine [https://nubip.edu.ua/sites/default/files/u284/polozh\\_ekzameni\\_zaliki\\_2020\\_dlya\\_saytu.pdf](https://nubip.edu.ua/sites/default/files/u284/polozh_ekzameni_zaliki_2020_dlya_saytu.pdf)

1. Oral and written current knowledge control.
2. The form of independent work of the applicant is the study of special literature and the implementation of individual tasks.
3. Examination.

Types of knowledge control of higher education students are current control, intermediate and final certification. Current control is carried out during practical classes and is aimed at checking the level of readiness of higher education students to perform specific work.

#### **9. Distribution of points received by applicants**

Student knowledge is assessed on a 100-point scale and converted to national grades according to Table 1 "Regulations on Exams and Tests at NULES of Ukraine" (order on implementation of 26.04.2023, protocol No. 10).

Applicant rating higher education, points	National assessment for the results of examinations	
	exams	test
90-100	perfectly	credited
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	not credited

### 10. Methodical support

1. Textbooks, manuals, workshops.
2. Workbooks and journals, scientific and methodological recommendations and guidelines.

### 11. Recommended books

#### Basic

1. Chayka V.M., Vagaliuk L.V. Ecological principles of conservation of agrobiodiversity of insect dendrobionts of the Northern Forest-Steppe of Ukraine: Monograph / V.M. Chaika, L.V. Vagaliuk / edited by Doctor of Agricultural Sciences, Professor V.M. Chaika - Kyiv, CP "Komprint", 2018. 174 p.
3. Vagaliuk L.V. Use of ecological network as a measure of biocenotic amelioration of agrolandscapes of Ukraine //International scientific and practical conference “Challenges, threats and developments in biology, agriculture, ecology, geography, geology and chemistry”: conference proceedings, July 2-3, 2021. Lublin: “Baltija Publishing” doi <https://doi.org/10.30525/978-9934-26-111-4-11>
4. Vagaliuk L. Assessment of the state of entomofauna biodiversity on the sanitary protection zone of the poultry farm Kyivska // Scientific journal "Biological Systems: Theory and Innovation." - Tom 12, № 2 (2021) <http://journals.nubip.edu.ua/index.php/Biologiya/article/view/15482> doi <https://doi.org/10.31548/biologiya2021.02.00410>.
6. Decision III/11: Conservation and sustainable use of agricultural biological diversity/Handbook of the Convention on Biological Diversity. 2nd edition (Updated to include the outcome of the sixth meeting of the Conference of the Contracting Parties. Secretariat of the Convention on Biological Diversity. 2018, pp 392-400.
7. V. Prydatko - Remote Sensing (RS) and Geographic Information Systems (GIS) as New Tools for Improvement of Woodland Inventory, Management and Woodland Protected Areas Development in Ukraine / CD -Conference on Woodland Key Habitats. Bialowiza, 2002, Poland.
8. Vagaliuk L. Guidelines to conduct practicals in the discipline “Biodiversity” for the "Bachelor" students in the specialty 101 «Ecology» / Compiler: associate professor L. Vagaliuk, Kyiv: NULES Publishing House of Ukraine, 2022. - 91 p.

### Information resources

1. The Law of Ukraine, <http://uk.wikipedia.org/wiki/> Wikipedia, the free encyclopedia, [http://www.sea.gov.ua/GIS/BSR/UA/documents/legislation/Prog\\_bio.htm](http://www.sea.gov.ua/GIS/BSR/UA/documents/legislation/Prog_bio.htm) Draft National Program for the Conservation of Biodiversity of Ukraine for 2007-2025

2. Sixth National Report on the Implementation of the UN Convention on Biological Diversity by Ukraine, [https://mepr.gov.ua/files/images/news\\_2019/31102019/CBD\\_all\\_UKR-fin.pdf](https://mepr.gov.ua/files/images/news_2019/31102019/CBD_all_UKR-fin.pdf)7.
3. Petrenko O. The system of landscape structuring of the country and landscape regulation of types of nature use / National Ecological Network of Ukraine: Priorities of formation // Collection of articles and speeches at the national conference 22.01.21.-K.: 2021.-P.28-33.