

**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF  
UKRAINE**

Department of General Ecology, Radiobiology and Safety of Life Activity

**"APPROVED"**

The Faculty of Land Management

“15” May 2025

**CURRICULUM OF ACADEMIC DISCIPLINE**

**General Ecology**

Field of knowledge G Engineering, manufacturing and construction

Specialty G18 Geodesy and Land Management

Academic programme "Geodesy and land management"

Faculty (Education and Research Institute): Faculty of Land Management

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Kyiv – 2025

## Description of the discipline General Ecology

*The course 'General Ecology' aims to deepen knowledge about the environment, to form future specialists' environmental thinking and outlook, taking into account the growing environmental threats and challenges in our time, to develop environmentally friendly skills, especially in the performance of official duties.*

*General ecology as an academic discipline represents a complex of various scientific knowledge about the interaction and mutual influence in the highly complex system of 'living organisms-environment', including the possible consequences of uncontrolled human impact on the environment. The discipline involves the use of modern technical means, as well as familiarity with international documents on the strategy of environmentally sound environmental management and sustainable development.*

Academic degree, specialty, academic programme		
Academic degree	Bachelor	
Specialty	G18 Geodesy and Land Management	
Academic programme	"Geodesy and land management"	
Characteristics of the discipline		
Type	optional	
Total number of hours	90	
Number of ECTS credits	3	
Number of modules	2	
Course project (work) (if any)	-	
Form of assessment	Credit	
Indicators of the discipline for full-time and part-time forms of university study		
	Form of obtaining higher education	
	Full-time	Part-time
Year of study	1	-
Semester	2	-
Lectures	15 hours	- hours.
Practical classes and seminars	15 hours	- hours
Laboratory classes	- hours	- hours
Self-study	60 hours	- hours
Number of hours per week for full-time students	2	

### 1. Aim, objectives, competences and expected learning outcomes of the discipline

Aim of the discipline 'General Ecology' is to deepen the knowledge about the environment, to form ecological thinking and worldview in future specialists in geodesy and land management, taking into account the strengthening of environmental threats and challenges in modern times, to form nature-friendly skills, especially in the performance of official duties.

#### **Acquisition of competences:**

Integral competence (IC): Ability to solve complex specialised problems of geodesy and land management.

General competencies (GC):

GC 01. Ability to learn and master modern knowledge.

GC 02. Ability to apply knowledge in practical situations.

GC 04. Ability to communicate in the state language both orally and in writing.

GC 13. The ability to preserve, enhance moral, cultural, scientific values and achievements of society based on an understanding of the history, patterns of development of the subject area, its place in the general system of knowledge about nature and society, as well

as in the development of society, technology and technology, to use various types and forms of physical activity for recreation and healthy lifestyle.

Special (professional) competences (SC):

SC01. Ability to apply fundamental knowledge to analyse phenomena of natural and man-made origin in the performance of professional tasks in the field of geodesy and land management.

SC02. Ability to apply theories, principles, methods of physical and mathematical, natural, socio-economic, engineering sciences in the performance of geodesy and land management.

SC08. Ability to carry out professional activities in the field of geodesy and land management with taking into account the requirements of professional and civilian safety, labour protection, social, environmental, ethical and economic aspects.

***Expected Learning Outcomes (ELO):***

ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.

## 2. Programme and structure of the discipline

Modules and topics	Number of hours													
	full-time							part-time						
	weeks	total	including					total	including					
			l	p	lab	ind	s.st			l	p	lab	ind	s.s t
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Module 1. <b>General provisions of ecology. Ecosystem approach in ecological study</b>														
Topic 1. Basic concepts and definitions of ecology as a science	1-2	12	2	2			8							
Topic 2. Methodology of ecology as a science. The concept of environment	3-4	11	2	2			7							
Topic 3. Basic patterns of the influence of environmental factors	5-6	11	2	2			7							
Topic 4. Ecosystems and their role in the biosphere's organisation	7-8	12	2	2			8							
Total for module 1	46		8	8			30							
Module 2. <b>Applied aspects of ecology and environmental protection</b>														
Topic 1. Productivity and dynamics of ecological systems	9-10	14	2	2			10							
Topic 2. Environmental issues of the current state of system “Nature–Society”	11-12	14	2	2			10							
Topic 3. Human impacts on the planet. Achieving environmental	13-15	16	3	3			10							

sustainability													
Total for module 2	44	7	7			30							
Total hours	90	15	15			60							
Course project (work)		-	-	-		-		-	-	-		-	
(if included in the curriculum)													
Total hours	90	15	15			60							

### 3. Topics of lectures

№	Topic title	Hours
1	Basic concepts and definitions of ecology as a science	2
2	Methodology of ecology as a science. The concept of environment	2
3	Basic patterns of the influence of environmental factors	2
4	Ecosystems and their role in the biosphere's organisation	2
5	Productivity and dynamics of ecological systems	2
6	Environmental issues of the current state of system "Nature–Society"	2
7	Human impacts on the planet. Achieving environmental sustainability	3

### 4. Topics of practical classes

№	Topic title	Hours
1	Links of ecology with other natural disciplines. Stages of formation of ecology as a science	2
2	Basic laws of ecology. Laws-axioms of B. Commoner	2
3	The impact of abiotic environmental factors on living organisms. Biotic factors and interactions in ecosystems	2
4	The study of trophic relationships in an ecosystem. Practical application of the rule of the ecological pyramid and the law of bioaccumulation (concentration)	2
5	Consequences of the impact of human activity on natural systems at the global level	2
6	Problems of ensuring environmental sustainability in Ukraine by the example of the "small motherland"	2
7	Problems of sustainable environmental management. Principles of sustainable production and consumption. Calculation of the individual ecological footprint	3

### 5. Topics for self-study

№	Topic title	Hours
1	The main directions of modern ecological research. Contribution of Ukrainian scientists to the development of ecology	8
2	Biosphere as a global ecosystem. The cycle of matters in the biosphere as a requirement for its sustainability	7
3	Basic environmental laws, principles and rules. Principles of ecological classification of organisms	7
4	The impact of natural and anthropogenic environmental factors on the stability of biota	8
5	Impact of human activities on natural systems. Environmental basics of nature protection	10
6	Land and soil degradation processes. National policy in the sphere of protection of land resources	10
7	Problems of ensuring sustainable nature management in Ukraine	10

## 6. Tools for assessing expected learning outcomes:

- oral or written questioning;
- interview;
- testing;
- defence of laboratory/practical, calculation/graphic works, projects;
- peer assessment, self-assessment.

## 7. Teaching methods:

- the method of problem-based learning;
- method of practice-oriented learning;
- case method;
- method of learning through research;
- method of educational discussions and debates;
- method of teamwork, brainstorming.

## 8. Assessment of learning outcomes:

The assessment of students' knowledge and skills is conducted by means of a 100-point scale and is converted into national grades of the current Exam and Credit Regulations at NULES of Ukraine.

### 8.1. Distribution of points received by students

Type of learning activity	Learning outcomes	Assessment
<b>Module 1. General provisions of ecology. Ecosystem approach in ecological study</b>		
Lecture 1 Basic concepts and definitions of ecology as a science	To know the subject and objectives of modern ecology as a science;	<b>2</b>
Practical class 1. Links of ecology with other natural disciplines. Stages of formation of ecology as a science	To know the main achievements of the world and Ukrainian environmental science. ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	<b>10</b>
Self-study 1. The main directions of modern ecological research. Contribution of Ukrainian scientists to the development of ecology		<b>6</b>
Lecture 2 Methodology of ecology as a science. The concept of environment	To understand the main points of Vernadsky's theory about the biosphere; To know the basic properties of the components of the environment; To comprehend the operation of the basic ecological laws, principles, and rules. ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	<b>2</b>
Practical class 2. Basic laws of ecology. Laws-axioms of B. Commoner		<b>10</b>
Self-study 2. Biosphere as a global ecosystem. The cycle of matters in the biosphere as a requirement for its sustainability		<b>6</b>
Lecture 3 Basic patterns of the influence of environmental factors	To understand the impact of natural and anthropogenic environmental factors on biota sustainability; To analyse the peculiarities of the effect of environmental factors on organisms.	<b>2</b>
Practical class 3. The impact of abiotic environmental factors on living		<b>10</b>

organisms. Biotic factors and interactions in ecosystems	ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	
Self-study 3. Basic environmental laws, principles and rules. Principles of ecological classification of organisms		5
Lecture 4 Ecosystems and their role in the biosphere's organisation	To understand the principles of ecosystem functioning; To know the basic ecological strategies of existence and survival of populations, general principles of adaptation of organisms; To calculate the possible consequences of environmental pollution for living organisms ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	2
Practical class 4. The study of trophic relationships in an ecosystem. Practical application of the rule of the ecological pyramid and the law of bioaccumulation (concentration)		10
Self-study 4. The impact of natural and anthropogenic environmental factors on the stability of biota		5
Module test 1.		30
<b>Total for Module 1</b>		<b>100</b>
<b>Module 2. Applied aspects of ecology and environmental protection</b>		
Lecture 5 Productivity and dynamics of ecological systems	To be able to take into account environmental aspects when analyzing and solving technical and economic problems, implementing development programs for enterprises and industries.  ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	2
Practical class 5. Consequences of the impact of human activity on natural systems at the global level		10
Self-study 5. Impact of human activities on natural systems. Environmental basics of nature protection		8
Lecture 6 Environmental issues of the current state of system "Nature–Society"	To know the main global environmental problems and environmental problems of Ukraine; To understand the role of man and society in creating and solving environmental problems. ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land management tasks.	2
Practical class 6. Problems of ensuring environmental sustainability in Ukraine by the example of the "small motherland"		15
Self-study 6. Land and soil degradation processes. National policy in the sphere of protection of land resources		8
Lecture 7 Human impacts on the planet. Achieving environmental sustainability	To learn the principles of sustainable (ecologically balanced) development of society and the principles of the strategy for preserving the environment and life on Earth; To learn the principles of sustainable (ecologically balanced) development of society and the principles of the strategy for preserving the environment and life on Earth; To apply the principles of protection and environmentally sound use of land resources in professional activities. ELO5. Apply conceptual knowledge of natural and socio-economic sciences in the performance of geodesy and land	2
Practical class 7. Problems of sustainable environmental management. Principles of sustainable production and consumption. Calculation of the individual ecological footprint		15
Self-study 7. Problems of ensuring sustainable nature management in Ukraine		8

	management tasks.	
Module test 2.		
<b>Total for Module 2</b>		<b>100</b>
<b>Educational work</b>	<b><math>(M1 + M2)/2 \cdot 0,7 \leq 70</math></b>	
<b>Examination</b>	<b>30</b>	
<b>Total for the course</b>	<b><math>(\text{Academic work} + \text{examination}) \leq 100</math></b>	
Course project (work) (if included in the curriculum)		<b>100</b>

## 8.2. Scale for assessing students 'knowledge and skills

Student's rating, points	National grading of exams and credits
90-100	excellent
74-89	good
60-73	satisfactorily
0-59	unsatisfactorily

## 8.3. Assessment policy

<b>Deadlines and exam retaking policy:</b>	Works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g., a sick leave).
<b>Academic integrity policy:</b>	Cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
<b>Attendance policy:</b>	Attendance is compulsory. For good reasons (e.g., illness, international internship), training can take place individually (online by the faculty dean's consent)

## 9. Teaching and learning aids

1. Електронний навчальний курс навчальної дисципліни «General Ecology» (ГіЗ): <https://elearn.nubip.edu.ua/course/view.php?id=2249>

2. Конспект лекцій з дисципліни «Основи екології» для студентів ОС Бакалавр за напрямом підготовки 193 Геодезія та землеустрій. К.: НУБіП. 2019. 134 с.

3. Ракоїд О.О., Клепко А.В., Бондарь В.І. Загальна екологія. Навчально-методичний посібник для студентів ОС Бакалавр за напрямом підготовки 193 Геодезія та землеустрій. К.: НУБіП. 2023. 133 с.

4. Ракоїд О.О., Бондарь В.І. Методичні рекомендації щодо виконання практичних робіт з дисципліни «Загальна екологія». К.: НУБіП. 2024. 60 с.

5. Rakoid O.O. Basics of Ecology. Study guide for EQL Bachelor with specialty 193 Geodesy and Land Management. Second edition. Kyiv: NUBIP, 2021. 227 p.

6. Rakoid O.O., Klepko A.V., Bondar V.I. General Ecology. Textbook for students of Bachelor's Degree in the specialty 193 "Geodesy and land management". Kyiv: NUBIP, 2024. 212 p.

7. Маленко Я.В., Ворошилова Н.В., Кобрюшко О.О., Перерва В.В. Загальна екологія: навчальний посібник. Кривий Ріг: КДПУ, 2023. 231 с.

8. Соломенко Л.І. Загальна екологія: підручник. Третє видання, випр. і доп. / Соломенко Л.І, Боголюбов В.М., Волох А.М. Херсон: Олді-плюс, 2020. 346 с.

#### 10. Recommended sources of information

1. Національний портал відкритих даних: <http://data.gov.ua>

2. Публічна кадастрова карта: <http://www.map.land.gov.ua/kadastrova-karta>

3. Громадський моніторинг стану якості повітря: <https://eco-city.org.ua/>

4. Програма Європейського Союзу Copernicus: <https://www.copernicus.eu/en>

5. Інтерактивна карта «Чиста вода»: [https://texty.org.ua/articles/86343/Chysta\\_voda\\_Interaktyvna\\_karta\\_rozpovist\\_pro\\_stan-86343/](https://texty.org.ua/articles/86343/Chysta_voda_Interaktyvna_karta_rozpovist_pro_stan-86343/)

6. Конвенція ООН про боротьбу з опустелюванням/База знань. <https://knowledge.unccd.int/>

7. Офіційний сайт Міністерства захисту довкілля та природних ресурсів України: <http://www.menr.gov.ua>

8. WWF Footprint Calculator: <https://footprint.wwf.org.uk/#/>

9. ЕкоЗагроза (офіційний вебресурс і мобільний додаток Міндовкілля, завдяки якому можна дізнатись достовірну інформацію про стан повітря, води, ґрунту та інші дані): <https://ecozagroza.gov.ua/>

10. Єдина екологічна платформа “ЕкоСистема”: <https://eco.gov.ua/>