

SYLLABUS OF DISCIPLINE
«Environmental Risks»



Degree of higher education - Bachelor
Specialization 101 Ecology
Educational program «Ecology»
Year of study 1, semester 2
Form of study full-time
Amount of credit ECTS 4
Language English

Course lecturer

Strokal

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Course page in eLearn:

<https://elearn.nubip.edu.ua/course/view.php?id=1988>

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Google Scholar:

<https://scholar.google.com/citations?user=U0a3vnEAAAAJ&hl=uk>

DESCRIPTION OF THE DISCIPLINE

The main aim of the course is to provide Bachelor students with knowledge about environmental risks in the world and their associated drivers and impacts. *The main course objectives* are (1) to discuss the environmental risks in relation to natural disasters, climate change, pollution (air, soil and water), human activities and biodiversity loss; (2) to identify the most relevant environmental risks in a specific continent in the world and their drivers and impacts; (3) design a flowchart that shows the most relevant interactions between drivers and impacts for the environmental risk of a continent.

The main pre-requisite to take this course is that the students follow the following two disciplines: “Introduction to the Specialization”, and “The Basis of the Environmental Education and Culture”. This course serves as the basis to take the next disciplines such as “General Ecology”, “Environmental safety” and “Landscape ecology”.

Набуття компетентностей:

Інтегральна компетентність (ІК): здатність вирішувати практичні проблеми у сфері екології, охорони навколишнього середовища та збалансованого природокористування.

Загальні компетентності (ЗК):

ЗК03. Здатність до адаптації та дії в новій ситуації.

ЗК13. Здатність зберігати та примножувати моральні, культурні, наукові цінності і досягнення суспільства на основі розуміння історії та закономірностей розвитку предметної області, її місця у загальній системі знань про природу і суспільство та у розвитку суспільства, техніки і технологій, використовувати різні види та форми рухової активності для активного відпочинку та ведення здорового способу життя.

Фахові (спеціальні) компетентності (ФК):

ФК08. Здатність обґрунтовувати необхідність та розробляти заходи, спрямовані на збереження ландшафтно-біологічного.

ФК12. Здатність до опанування міжнародного та вітчизняного досвіду вирішення регіональних та транскордонних екологічних проблем.

Програмні результати навчання (ПРН):

ПРН06. Виявляти фактори, що визначають формування ландшафтно-біологічного різноманіття.

ПРН09. Брати участь у розробці та реалізації проєктів, направлених на оптимальне управління та поведіння з виробничими та муніципальними відходами.

COURSE STRUCTURE

Topics	Hours (lectures, practicals)	Learning Outcomes	Assignments	Assessment
Module 1. Theoretical principles of environmental risks and their classifications				
Delivery of all practical works and performance of independent works takes place including in the platform Elearn				
Topic 1. Definition of environmental risks	2/2	<i>Practical №1. Learning the definition of environmental risks</i>		
		Definition of environmental risk	Students will learn several definitions of the environmental risk by solving a puzzle, reviewing relevant literature and summarizing the outcome of that review in a poster	Submit a puzzle on the platform E-learn (or present it in class) 15
Topic 2. Principles of environmental risks	2/2	<i>Practical №2. Principles of environmental risks</i>		
		Principles of environmental risks	Students will be asked to study principles of the environmental risks by discussing the principles from the provided literature and summarizing the outcome of that discussion on a slide that students will present	Submit the presentation on the platform E-learn (or present it in class) 15
Topic 3. Classifications of environmental risks	2/2	<i>Practical №3. Classifications of environmental risks</i>		
		The classifications of the risks. This classification will be the basis for module 2.	Students will study that classification via brainstorming with their partner and summarizing the outcome of that brainstorm on a slide	Submit the presentation on the platform E-learn (or present it in class) 15
		<i>Self-study work №1. To identify climate-sensitive health risks, their exposure pathways, and vulnerability factors</i>		
		Impacts of Climate Change on people and environment, their implications, and who response	Students will write an Essay about an overview of climate-sensitive health risks, their exposure pathways, and vulnerability factors. Students will include in the Essay information about the direct and indirect impacts of Climate Change on health. For this task, students will use a report from the World Health Organization (WHO): https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health	Submit the Essay on the platform E-learn (or present it in class). The essay should have 250 words, include one own-created picture (scheme), and conclusions. 25
Module 1	6/6	Evaluation of the result of knowledge and skills according to the topics included in the module №1		Test 30
RESULT FOR THE MODULE 1				100
Module 2. Environmental risks, their types and interactions				
Delivery of all practical works and performance of independent works takes place including in the platform Elearn				
Topic 4. Natural disasters	2/2	<i>Practical №4. To identify the causes of Natural disasters</i>		
		Impacts and causes of natural disasters, their implication to the environment (habitat, air, soil, water, biodiversity)	Students will form small groups and select one natural disaster that will be studied in more depth. Assignments will be given to identify the causes and effects of that selected disaster via a two-slide presentation	Submit the presentation (two-slides) on the platform E-learn (or present it in class) 10
Topic 5.	4/4	<i>Practical №5. To identify the causes of Climate Change</i>		

Climate change		Climate change glossary, some effects and causes of Climate Change, the social impacts of Climate Change, carbon footprint and greenhouse gases.	Students in their groups (formed in Topic 4, see above) will be asked to map the most recent climate change disasters that have happened in the world over the past 5 years. For each group, a continent will be assigned to study and identify which climate change events happened (e.g., droughts, floods, heatwaves) and where in the continents over the past 5 years. Each group will form their answers in the form of two slides	Submit the presentation (two-slides) on the platform E-learn (or present it in class) 10
Topic 6. Pollution	6/6	<i>Practical №6. To identify the causes of Pollution</i>		
		Type of pollution (air, soil, water), their impacts and causes; factors contribute to environmental pollution; correlation of environmental pollution; soil and land contamination; sources of water, air and soil pollution.	Students will continue working in their groups and on the same continent. In this topic, the focus will be on air, water and soil pollution of that continent. Students will study relevant literature and identify the most pollution problems (e.g, either water, soil or air or combinations of several). Students will summarize their outcomes in the form of two slides.	Submit the presentation (two-slides) on the platform E-learn (or present it in class) 10
Topic 7. Biodiversity loss	4/4	<i>Practical №7. To identify the causes of Biodiversity loss</i>		
		Habitat destruction, invasive species, overexploitation; Bending the curve of biodiversity loss; natural biodiversity loss; human-driven biodiversity loss; ecological effects; solutions to biodiversity loss	Students will continue working in the same group and on the same continents as was assigned in the previous topics. Here, an assignment will be to identify which biodiversity species are most vulnerable to their loss due to climate change impacts (based on their outcome on Topic 5) and pollution (based on their outcome on Topic 6). Results will be presented in two slides.	Submit the presentation (two-slides) on the platform E-learn (or present it in class) 10
Topic 8. Human activities	4/4	<i>Practical №8. To identify the causes of Human Activities</i>		
		Main human activities and their effects on the environment (deforestation, mining, agriculture urbanization); mapping the impacts of human activities.	Students continue working in the same group and on the same continent. Here, they build on the outcomes from Topics 1-7 and analyse the most dominant human activities in their continent. Students will be asked to link those human activities to the impacts of pollution and climate change (e.g., how those activities contribute to climate change? And to pollution?). Answers to those questions will be summarized on two slides.	Submit the presentation (two-slides) on the platform E-learn (or present it in class) 10
Topic 9. Interactions and overall impacts	2/2	<i>Practical №9. To identify the main environmental risk</i>		
		Learning outcomes are based on Topics 4-8	Students will be asked to reflect back on the outcomes of their group work that they performed on Topics 4-8. Students will revise their slides from the	Submit the flowchart on the platform E-learn (or present it in class)

			previous assignments. They will identify the main environmental risk in their continent and form a flowchart that can show the most relevant interactions between drivers and impacts for the environmental risk. Thus, the flowchart should include drivers of that risk (e.g., human activities from Topic 8), the status of the environment (e.g., pollution levels from Topic 6), impacts (e.g., biodiversity loss from Topic 7, natural disasters from Topic 4) and responses to the environmental risk (new assignment).	10
Topic 10. Methodology for quantifying environmental risks	2/2	<i>Practical №10. To address the environmental risks</i>		
		Learning outcomes are based on Topic 9	Students will be given examples of simple methodologies to address the environmental risks including modeling and indicators. Students will discuss those examples and draw lessons on the applicability of those methodologies for their environmental risk (see Topic 9).	Submit the answers of discussion on the platform E-learn (or present it in class)
Module 2	24/24	Evaluation of the result of knowledge and skills according to the topics included in the module №1		Test 30
RESULT FOR THE MODULE 2				100
Total	30/30	Calculated as the sum of all modules in terms of 70% of the total score for the course		70
Exam		The exam includes 30% of the total grade for the course	10 test questions of varying difficulty, 2 questions ECE	30
TOTAL FOR THE COURSE				100

EVALUATION POLICY

Policy on deadlines and rearrangements:	Works that are submitted in violation of the deadlines without good reason are evaluated at a lower grade. Rearrangement of modules takes place with the permission of the lecturer if there are good reasons (for example, hospital).
Policy on academic integrity:	Write-offs (duplication of work with another student) during tests and exams are prohibited (including the use of mobile devices). Course papers, abstracts must have correct textual references to the literature used.
Policy on visiting:	Attendance is mandatory. For objective reasons (for example, illness, international internship) training can take place individually (in online form in consultation with the dean of the faculty)

ASSESSMENT OF STUDENTS

Points	Assessment	
	Exam	Test
90-100	Excellent	Pass
74-89	Good	
60-73	Satisfactory	
0-59	Unsatisfactory	Fail

Literature supporting the course:

1. Екологічна безпека: підручник / В.М. Шмандій, М.О. Клименко, Ю.С. Голік, А.М. Прищеп, В.С. Бахарев, О.В. Харламова. Херсон : Олді-Плюс, 2019. 366 с.
2. Забезпечення екологічної безпеки: підручник / М.В. Сарапіна, В.А. Андронов, С.Р. Артем'єв, О.В.

Бригада, О.В. Рибалова. Харків : НУЦЗУ, 2019. 246 с.

3. Екологічна безпека інженерної діяльності: підручник / Ю. В. Носачова, О. І. Іваненко, В. В. Вембер. Київ : Кондор, 2020. 212 с.
4. Войціцький, В. М., Хижняк, С. В., Данчук, В. В., Мідик, С. В., Гришук, І. А., & Ушкалов, В. О. (2020). Екологічні ризики: природа і критерії. Заступник головного редактора: Нагорнева НА, 131. URL: <http://ecoj.dea.kiev.ua/archives/2020/4/23.pdf>
5. Палапа, Н. В., & Гончар, С. М. (2022). Екологічні ризики, пов'язані із сільськогосподарською діяльністю людини. *Агроекологічний журнал*, (1), 68-80. <https://doi.org/10.33730/2077-4893.1.2022.255189>
6. Rojas-Rueda, D., Morales-Zamora, E., Alsufyani, W. A., Herbst, C. H., AlBalawi, S. M., Alsukait, R., & Alomran, M. (2021). Environmental risk factors and health: an umbrella review of meta-analyses. *International journal of environmental research and public health*, 18(2), 704. <https://doi.org/10.3390/ijerph18020704>
7. Topping, C. J., Aldrich, A., & Berny, P. (2020). Overhaul environmental risk assessment for pesticides. *Science*, 367(6476), 360-363. DOI: 10.1126/science.aay1144 / URL: https://www.science.org/doi/full/10.1126/science.aay1144?casa_token=WUGR9z0kkoAAAAAA%3AgAKRb7Lw3jsmeoQulFylMtSOU3ZznydT5S01Dn9WNY_IT0dJJlLTPDNS69iKsRFikIQCaYE3tcckus
8. Paul, B. K. *Environmental Hazards and Disasters: Contexts, Perspectives and Management*: book. *John Wiley & Sons*. 55 p. URL: https://books.google.com.ua/books?hl=uk&lr=&id=F7i4KeOUe3cC&oi=fnd&pg=PT9&dq=type+of+environmental+hazards&ots=nuJVHtRWdN&sig=4c0J6Z4Z0_K443WC8vR2aeINfWk&redir_esc=y#v=onepage&q=type%20of%20environmental%20hazards&f=false
9. Вплив російської агресії на стан природних ресурсів України : монографія / В. П. Строкаль [та ін.]. Київ : Видавничий центр НУБіП України, 2023. 222 с. URL: <https://dglb.nubip.edu.ua/handle/123456789/10632>
10. Макаренко Н.А., Строкаль В.П., Бережнюк С.М. та інші (2022). Вплив російської воєнної агресії на природні ресурси України: аналіз ситуації, методологія оцінювання. Наукові доповіді НУБіП України, (4 (98)). URL: <http://journals.nubip.edu.ua/index.php/Dopovidi/article/view/16137>