NATIONAL UNIVERSITY OF LIFE AND ENVIROMENTAL SCIENSES OF UKRAINE

Department of General Ecology, Radiobiology and Safety of Life Activity

APPROVED
Dean of Faculty of Plant Protection,
Biotechnologies and Ecology
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“___” _____ 2021

REVIEWED AND APPROVED
at the meeting of the Department of General Ecology,
Radiobiology and Safety of Life Activity
Protocol dated ”__” 05. 2021 № ___
Head of department
_____ **V.M. Bogolyubov**
"___" _____ 2021

REVIEWED
Guarantor of EP "Ecology and Environmental Protection"
_____ (V.A. Gaichenko)

WORKING TEACHING PROGRAM FOR THE DISCIPLINE

Strategy of Sustainable Development

Спеціальність 101 Ecology_____

Освітня програма Educational and professional program "Ecology and Environmental Protection"_____

Факультет ___Faculty of Plant Protection, Biotechnologies and Ecology_____

Розробник: Rakoid Olena Olexandrivna, PhD on agrarian sciences_____

Kyiv - 2021

1. Description of academic discipline

_____Strategy of Sustainable Development_____
(назва)

Direction, speciality, educational program and qualification level		
Educational and qualification level	*Master*	
Speciality	*101 Ecology*	
Educational program	*Educational and professional program "Ecology and Environmental Protection"*	
Characteristics of academic discipline		
Mode	Regulatory	
Total number of hours	115	
Number of credits ECTS	4	
Number of meaningful modules	2	
Course project (work) (if available)	-	
Form of control	*Exam*	
Indicators of academic discipline for full-time and part-time forms of education		
	full-time education	part-time education
Year of study (course)	1	-
Semester	1	-
Lectures	*15 hours*	*- hours*
Practical and seminar lessons	*30 hours*	*- hours*
Laboratory practical	*- hours*	*- hours*
Self-dependent work	*70 hours*	*- hours*
Self-dependent work	*- hours*	*hours*
Week hours for full-time education	*3 hours*	

2. Objective, tasks and competencies of academic discipline

Objective The main objective of discipline is formation the theoretical knowledge and practical skills on the problems of the interaction between man and environment needed for decision making in further professional activities in accordance with the principles of sustainable development.

Tasks The study of the nature and the basic concepts and principles of sustainable development, the concept of the biosphere as a dynamic system, basic information about global environmental problems of humanity - resources and development of human impacts on the biosphere; qualitative and quantitative criteria of sustainability as well as modelling of social development, economic, social and political environmental and ethical issues of development and problems of managerial decisions.

After mastering the course, the student should

know:

- basic patterns of stationary open systems;
- the relationship between the social development factors;
- indicators of sustainable development;
- principles of systematization and generalization of ecological and socio-economic information;
- conditions and management mechanisms for ensure of progressive environmental or socio-economic sustainable development.

be able:

- to calculate local and regional indicators of sustainable development;
- to monitor the study of natural and socio-economic systems;
- to justify decisions related to the development of socio-economic systems;
- to create action plans for sustainable development;
- to collect information for the calculation of indicators of sustainable development;
- to evaluate indicators of environmental, social and economic processes and phenomena in society and nature;
- to implement the decisions that necessary to ensure sustainable development in the information society.

These learning outcomes are the basis for the formation of the following competencies:

general competencies:

K01. Ability to learn and acquire modern knowledge.

K02. Ability to make informed decisions.

K05. Ability to communicate in a foreign language.

K06. Ability to search, process and analyze information from various sources.

K07. The ability to motivate people and move towards a common goal.

professional (special) competencies:

K10. Ability to apply interdisciplinary approaches in critical understanding of environmental issues.

K12. Ability to apply new approaches to the analysis and prediction of complex phenomena, critical understanding of problems in professional activities.

K13. Ability to prove knowledge and own conclusions to specialists and non-specialists.

K15. Ability to organize work related to environmental assessment, environmental protection and optimization of nature use, in conditions of incomplete information and conflicting requirements.

K16. Ability for self-education and training based on innovative approaches in the field of ecology, environmental protection and sustainable use of nature.

K17. Ability to independently develop environmental projects by creatively applying existing ideas and generating new ideas.

К18. Ability to assess the level of negative impact of natural and anthropogenic environmental hazards on the environment and humans.

- Program learning outcomes:

ПРН02. Be able to use conceptual environmental patterns in professional activities.

ПРН03. Know at the level of the latest achievements the basic concepts of natural science, sustainable development and methodology of scientific knowledge.

ПРН07. Be able to communicate in a foreign language in scientific, industrial and social spheres of activity.

3. Programme and structure of academic discipline for:

– full-time students

Name of meaningful modules and topics	Number of hours												
	full-time education							part-time education					
	weeks	in total	including					in total	including				
			L	Pr	Lab	Ind	Sw		L	Pr	Lab	інд	Sw
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Meaningful module 1. Theoretical aspects of sustainable development													
Topic 1. Basic concepts and definitions of sustainable development	1-2	15	2	4			9						
Topic 2. Fundamentals of the theory of complex systems and the theory of evolution	3-4	14	2	4			8						
Topic 3. Environmental issues of the current state of system “Nature−Society”	5-6	15	2	4			9						
Topic 4. The background of the concept of sustainable development	7	13	1	3			9						
In total for meaningful module 1	57		7	15			35						
Meaningful module 2. Practical implementation of the principles of sustainable development													
Topic 1. International activities relevant to sustainable development	8-9	14	2	3			9						
Topic 2. Assessment of progress toward	10-11	15	2	4			9						

sustainable development													
Topic 3. Sustainable development policy: introductory process in Ukraine	12-13	15	2	4			9						
Topic 4. Education for sustainable development	14-15	14	2	4			8						
In total for meaningful module 2	58		8	15			35						
Total number of hours	115		15	30			70						
Course project (work)					-		-			-	-		-
Total number of hours	115		15	30			70						

4. Topics of seminar lessons

№	The topic title	Hours
	Not provided for working degree course scheme	

5. Topics of practical lessons

№	The topic title	Hours
1	Scientific basis, history and stages of the concept of sustainable development	4
2	Fundamentals of the theory of evolution and principles of functioning of ecosystem	4
3	Modern global challenges and the concept of globalization. Environmentally sound ecosystem management	4
4	Ecosystems and human well-being. Notion and classification of ecosystem services	3
5	International cooperation in the field of sustainable development as one of new environmental issues and phenomena have arisen since Rio 92	3
6	CSD indicators of sustainable development. Aggregated indicators of SD	4
7	Social and economic background of to ensure sustainable development of Ukraine. Ensuring environmental sustainability as a prerequisite for Ukraine's transition to sustainable development	4
8	Sustainable Development Goals and Agenda 2030. Implementation of SDGs in Ukrainian policy and practice	4

6. Topics of laboratory practicals

№	The topic title	Hours
	Not provided for working degree course scheme	

7. Control questions, sets of tests to determine the level of knowledge acquisition by students.

Control questions

1. What are the main stages of sustainable development of system "nature-society"?
2. Modern global challenges are (choose the right answers)
   1) Population grows
   2) High level of poverty
   3) Changing the quality of environment
   4) Decreasing human needs
3. What are the positive sides of the process of globalization?
4. What are the major elements of sustainable development?
   1) Ecology
   2) Environment
   3) Policy
   4) Society
5. The fundamental values on which UN Millennium Declaration is based are…
6. Socio-economic issues (Millennium Development Goals) include eradication extreme poverty and hunger (Yes or No)
7. Sustainability is about:

1 us, human beings	A Human Wellbeing
2 the environment, the ecosystem in which we live	B Environmental Wellbeing
3 the economy, which enables us to do what we do	C Economic Wellbeing

8. The major problems and obstacles in enhancing forest cover in Ukraine are:
9. Issues and indicators for the implementation of the Millennium Development Goals in Ukraine:

1 Reduce Poverty	A Share of population whose daily consumption3 is below US $ 5 (PPP), %
2 Promote Gender Equality	B Ratio of average wages between women and men, %
3 Improve maternal health	C Abortion level, number of abortions per 1,000 women of fertile age
4 Ensure Environmental Sustainability	D Volume of reused water disposals, million cubic metres per year

10. Is the one of targets of MDG Ukraine to stabilize by 2020 greenhouse gas emissions at 20% below 1990 levels? (Yes or No)
11. Basic principles of sustainability:

1 intra-generational equity	A solidarity between all people living today

2 inter-generational equity	B leaving next generations not empty-handed by the depletion of resources and spoiling the environment
3 ecological limits	C living within the carrying capacity of the earth
4 precautionary principle	D in case of insufficient information, it is better to err on the side of caution, then to run the risk of irreversible decline

12. The process of establishing an MDG framework in Ukraine started in:
   1) 1999
   2) 2000
   3) 2001

13. What have a new environmental issues and phenomena arisen since 1992?

1 The Green Economy	A Viable pathways for fundamentally shifting economic development to become more low-carbon
2 Carbon Trading	B Placing a monetary value on greenhouse gas emissions and creating a market for trade in carbon
3 Markets for Organic Products and Eco-labeling	C Consumer demand for goods that are produced in a sustainable way has boosted certification and eco-labeling
4 Recycling	D Products and materials is becoming mainstream policy and practice in several countries
5 Nano Materials	E This new technology offers significant opportunities and benefits in the fields of energy, health care, clean water and climate change

14. The aggregated indicators of SD

1 Human Development Index	A is a useful tool to measure human development across different countries and regions
2 Living Planet Index	B is a measure of the state of the world's biological diversity
3 Ecological Footprint	C is a measure of human demand on the Earth's ecosystems

15. What is the place of Ukraine in the countries' rating according to Human Development Index?
   1. 34
   2. 76
   3. 64

16. What is the biocapacity?

17. Global multilateral environmental agreements and obligations

1 UN Framework Convention on Climate Change	A Vienna, 1985
2 Kyoto Protocol	B Stockholm, 2001
3 Convention for the Protection of the Ozone Layer	C New-York, 1992
4 Convention on Persistent Organic Pollutants	D Kyoto, 1997
5 Convention on Biological Diversity	E Paris, 1994
6 UN Convention to Combat Desertification	F Rio-de-Janeiro, 1992

18. The Living Planet Index (LPI) is a measure of the state of the world's biological diversity based on population trends: (name them)
19. The Conception of Sustainable Development of Ukraine was adopted as a law in 2002, wasn't it?
20. The HDI is a summary measure of a country's average achievement in attaining:
1) a long and healthy life;
2) access to knowledge;
3) a decent standard of living;
4) gender-related development index
21. The objectives of the Bologna process are (choose the right answers):
- broad access to high quality higher education;
- facilitating mobility of students and staff;
- welcoming students from all over the world.
22. The main objectives of education for sustainable development (name them)
23. The priority tasks of the transitional process to sustainable development are:
1) Creation of the legal base for transition to sustainable development;
2) Poor understanding of the basic ideological approaches to the sustainable development policy;
3) Energy and resource saving;
4) Formation of the effective structure of environmental protection management
24. What did fundamental document in environment protection in Ukraine approve in 2010?
25. What are a major contributor to climate change?
26. The World Summit on Sustainable Development Rio+10 was held

1 2001	A Johannesburg
2 2002	B Rio de Janeiro
3 2003	C Marrakesh

27. The set of key indicators that constitute a snapshot of major global and regional environmental issues are:
1. Depletion of the ozone layer
2. Climate change
3. Quality lifelong education
4. Natural resource use
5. Chemicals and waste
28. CSD indicator themes

1 Economic	A Consumption and production patterns
2 Environmental	B Natural hazards
3 Social	C Governance

29. Biodiversity loss continues to be an issue of major concern, as indicated by the Red List Index (RLI) of Threatened Species (Yes or No)
30. What is relationship between human development and social exclusion and social inclusion?

Sets of tests

НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ БІОРЕСУРСІВ І ПРИРОДОКОРИСТУВАННЯ УКРАЇНИ			
ОС «Магістр» **напрям підготовки/** **спеціальність** 101 Ecology	**Кафедра** **загальної екології,** **радіобіології та** **безпеки** **життєдіяльності** 2021-2022 навч. рік	**ЕКЗАМЕНАЦІЙНИЙ** **БІЛЕТ № 1** з дисципліни **Strategy of Sustainable Development**	**Затверджую** Зав. кафедри _____ (підпис) В.М. Боголюбов _____2021 р.
Екзаменаційні запитання			
1. The UN Conference on Environment and Development in Rio (1992) and their main outcome documents.			
2. What form of evolution is called “co-evolution”? Give some examples.			
Тестові завдання різних типів			
1. Who did express the basic tenet of system theory: “The whole is more than the sum of the parts”?			
2. Natural selection is the process that depends on an organism’s ability to survive in a changing environment			
Yes	No		
3. Main obstacles Ukraine is facing on the way to development and introduction of the sustainable development policy:			
a. Lack of qualified staffing potential;			
b. Lack of well-educated people;			
c. Lack of systematic training of the specialists on sustainable development;			
d. Insufficient informational support to development and introduction of the sustainable development strategy;			
e. Sufficient energy and resource saving.			
4. Conceptual frameworks for SD indicators:			
1 Driving force indicators 2 State indicators 3 Response indicators	A describe the current situation B reflect societal actions aimed at moving towards sustainable development C describe processes or activities that have a positive or a negative impact on sustainable development		
5. Aggregated indicators of SD include:			
a. The Human Development Index;			
b. Education Index;			
c. Life Expectancy Index;			
d. Ecological Footprint;			
6. When did Ukraine accede to the globally recognized Millennium Development Goals?			
7. Key indicators of major global environmental issues and their trends:			
1 Ozone Layer 2 Global Climate 3 CO_2 emissions 4 Natural resource	A are continuing to increase B are overexploited C is depleting D is warming		
8. Education for sustainable development is a lifelong process			
Yes	No		
9. Ecosystem services:			
1 provisioning services 2 regulating services 3 cultural services 4 supporting services	A spiritual, religious, aesthetic etc. B food, fresh water, fiber etc. C climate regulation, disease regulation etc D soil formation, nutrient cycling etc..		
10. What does Rio+20 outcome document call?			
a. Multilateral Environmental Agreement;			
b. The Future we Want;			
c. Millennium Development Goals;			
d. Our Common Future.			

8. Teaching methods

Class hours: lectures and practical (seminar) lessons.

Self-dependent work of students in the discipline "Strategy of Sustainable Development of Nature and Society" includes self-study (paperwork for mastering the most difficult topics in the discipline); preparation for practical (seminar) lessons; preparation for the exam.

9. Forms of control

Control of knowledge and skills of students (current and final) with the discipline "Strategy of sustainable development of Nature and Society" is performed according to credit-modular system of educational process.

Final (general estimation) of course of teaching discipline is the sum of rating estimations (points) which was obtained for individual measured forms of educational activity: current and final testing level of theoretical material's learning in the classroom and self-dependent work (control module); estimation (points) for the laboratory studies. The final estimation is assigned after a complete study of the discipline, which is derived as the sum of midterm estimations for meaningful modules.

The final evaluation of the level of knowledge consists with ranking academic work which is assigned for evaluation as 70 points and rankings of test (exam) - 30 points.

10. Distribution of points received by students

Assessment of student knowledge is on a 100-point scale and is translated into national assessments according to table 1 of "Regulation on exams and tests at the National University of Life and Environmental Sciences of Ukraine" (approved by the Academic Council of NUBIP of Ukraine dated 27.12.2019 № 1371).

Rating of the applicant for higher education, points	**The assessment is national based on the results of passing**	
	exams	**tests**
90–100	**excellent**	**passed**
74–89	**good**	
60–73	**satisfactory**	
0–59	**poor**	**failed**

To determine the rating of the applicant for higher education in the discipline $\mathbf{R_{ДИС}}$ (up to 100 points) the obtained rating for certification (up to 30 points) is added to the rating for educational work $\mathbf{R_{НР}}$ (up to 70 points): $\mathbf{R_{ДИС} = R_{НР} + R_{АТ}}$.

11. Methodical support

1. Report of the United Nations conference on environment and development (Rio de Janeiro, 3-14 June 1992) / http://www.un.org/ documents/ga/conf151/aconf15126-1annex1.htm

2. Rakoid O.O. Textbook for the discipline “Strategy of sustainable development” and tasks to perform self-dependent works for students with specialization in 8.04010601 "Ecology and Environmental Protection". – Kyiv, 2014. – 177 p.

3. Johannesburg Declaration on Sustainable Development. From our origins to the future / http://www.un.org/esa/sustdev/documents/ WSSD_POI_PD/English/ POI_PD.htm

4. Закон України «Основні засади (стратегія) державної екологічної політики України на період до 2030 року» від 28.02.2019 № № 2697-VIII.

5. Указ Президент України “Про Цілі сталого розвитку України на період до 2030 року” від 30 вересня 2019 року № 722/2019.

6. Національна доповідь “Цілі сталого розвитку: Україна”. – Міністерство економічного розвитку і торгівлі України, 2017. – 176 с.

7. Боголюбов В.М., Ракоїд О.О. Стратегія сталого розвитку: Навчально-методичний посібник для самостійного вивчення дисципліни (для студентів ОС „Магістр” спеціальності 101 Екологія). − К.: НУБіП, 2017. – 152 с.

8. Rakoid O.O., Bogoliubov V.M. Strategy of sustainable development. Study guide. – Kyiv: NULES, 2017. – 300 p.

9. Боголюбов В.М., Клименко М.О., … Ракоїд О.О. Стратегія сталого розвитку: підручник − К.: НУБіП, 2018. – 444 с.

10. Summary of the United Nations Conference on Sustainable Development 13-22 June 2012 / http://www.iisd.ca/vol27/enb2751e.html

12. Recommended literature

Basic

1. Стратегія сталого розвитку: Навчальний посібник / За заг. ред. Боголюбова В.М.. – К.: НАУ, 2008. – с.

2. Білявський Г.О., Бутченко. Основи екології: теорія і практикум: Навч.посібник. – К.: Либідь, 2004. – 368 с.

3. Бурдіян Б.Г. та ін. Навколишнє природне середовище та його охорона: Навч. посібник. – К.: Вища школа, 1993.

4. Данилов-Данильян В.И., Лосев К.С. Проблемы устойчивого развития человечества, В кн. "Россия в окружающем мире: 1998". − М.: Изд-во МНЭПУ, 1998. – С. 39-52.

5. Rakoid O.O. Textbook for the discipline “Strategy of sustainable development” and tasks to perform self-dependent works for students with specialization in 8.04010601 "Ecology and Environmental Protection". – Kyiv, 2014. – 177 p.

6. Дейлі Герман. Поза зростанням. Економічна теорія сталого розвитку/переклад з англійської: Інститут сталого розвитку. — К.: Інтелсфера, 2002. — 312 с.

7. Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.
8. Ukraine in 2015: Millennium Development Goals adapted for Ukraine/ http://www.undp.org.ua/en/millennium-development-goals/mdgs-in-ukraine
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13. RIO 2012 Issues Briefs Current Ideas on Sustainable Development Goals and Indicators. Produced by the UNCSD Secretariat No. 6
14. Ревель П., Ревель Ч. Среда нашого обитания: В 4-х книгах. Пер. с англ. – М.: Мир, 1994.
15. Степаненко С.Н. Десятилетие ООН по образованию для устойчивого развития (2005-2014). – Одесса, 2005. – 20 с.
16. Sustainable Development. Linking economy, society, environment (By Tracey Strange and Anne Bayley). OECD Publishing, Paris 2008.
17. Allaby M. Basics of Environmental Science. London, 2002.
18. Miller G.T. Living in the Environment. An introduction to Environmental Science. 5th ed., Wadsworth Publ. Belmont, 1998.

Additional

1. Вернадський В. Биосфера. - М.: Мысль, 1967, 376 с.
2. Белявский Г.О., Варламов Г.Б., Гетьман В.В. и др. Оценка воздействия объектов энергетики на окружающую среду/Учебное пособие. – Харьков, 2002. – 359 с.
3. Гор А. Земля у рівновазі / Переклад з англ.: Інститут сталого розвитку. – К.: Інтелсфера, 2002. – 312 с.
4. Охрана и оптимизация окружающей среды / Под. ред. А.А.Лаптєва. – К.: Либідь, 1990. – 154 с.
5. Небел Б. Наука об окружающей среде (Как устроен мир)/Перевод з англ. Т. 1,2. – М.: Мир, 1993. Т.1. – 420 с. Т2. – 328 с.
6. Maddison, A. (2001) The World Economy: A Millennial Perspective, OECD Publishing, Paris.

13. Reference resources

1. Analysis of sustainable development in Ukraine: http://wdc.org.ua/en/services/ukraine-sd
2. United Nations Environment Programme: http://www.unep.org/Geo/
3. International Institute for Sustainable Development: http://www.iisd.org/

4. Sustainable Development knowledge platform: http://sustainabledevelopment.un.org/
5. Sustainable Environment: http://www.sustainable-environment.org.uk/
6. WORLD DATA CENTER for Geoinformatics and Sustainable Development: http://wdc.org.ua/en/services/ukraine-sd