

Документ подписан простой электронной подписью
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**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA**

Institute of Environmental Engineering

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

Green Economy and Sustainability Assessment Tools

course title

Recommended by the Didactic Council for the Education Field of:

44.04.02 Psychological and Pedagogical Education

field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

Environmental Pedagogy

higher education programme profile/specialisation title

Moscow, 2023

1. COURSE GOALS:

The main purpose is to introduce students to familiarize themselves with the rationale and core concepts guiding an inclusive green economy, to equip students with knowledge, skills and abilities to operate as main actors in the progress and creation of both opportunities and challenges at global and national level to achieve sustainability, resource efficient and socially inclusive development.

The above goal can be reached by the solution of a number of objectives:

- analysing the rationale and core concepts for realizing an inclusive green economy against business as usual practices.
- identifying enabling conditions for greening national economies.
- discussing the principal opportunities and challenges in key sectors in the transition to the green economy.
- analysing examples of national strategies and planning to advance an inclusive green economy.
- classifying international frameworks and initiatives in support of an inclusive green economy.

2. LEARNING OUTCOMES

Mastering the discipline "Green economy and sustainability assessment tools" is aimed at developing the following competencies (parts of competencies) among students:

Table 2.1. List of competencies formed by students in the course of mastering the discipline (the results of mastering the discipline)

Competence code	Competence	Indicators of Competence Formation / Development
GC-1	GC-1. Able to carry out a critical analysis of problem situations based on a systematic approach, to develop a strategy of actions	GC-1.1. Knows how to solve problematic problems and identify their components and connections between them. GC-1.2 Is able to search for solutions to a problem based on available and reliable sources of information. GC-1.3 Has a strategy for solving a problem situation based on systemic and interdisciplinary approaches
GC-2	GC-2. Able to manage the project at all stages of its life cycle	GC-2.1 Formulates a project task based on the problem posed and a way to solve it through the implementation of project management. GC-2.2 Develops a project concept within the framework of the designated problem (in the chosen professional field): formulates the purpose, objectives, substantiates the relevance, significance (scientific, practical, methodological and other, depending on the type of project), expected results and possible areas of their application. GC-2.3 Develops a project implementation plan using planning tools; develops and analyzes alternative project options to achieve the intended results
GC-6	GC-6. Able to determine and implement the priorities of their own activities and ways to improve it based on self-assessment	GC-6.1 Able to analyze large amounts of information of professional content GC-6.2 Able to analyze, synthesize and optimize solutions to the tasks
SPC-4	SPC-4. Able to carry out activities for the protection, use, monitoring and restoration of biological resources, using knowledge of the laws and methods of general and applied ecology	SPC-4.1. Uses in professional activities methods of analysis and modeling of environmental processes, anthropogenic impacts on living systems and environmental forecasting SPC-4.2. Substantiates the ecological principles of rational nature management and nature protection

3. PROGRAMME STRUCTURE

The course "Green economy and sustainability assessment tools" refers to an optional discipline as part of block 1 of the curriculum.

As part of the educational program of higher education, students also master other disciplines that contribute to the achievement of the planned results of mastering the discipline " Green economy and sustainability assessment tools ".

Table 1. List of Higher Education Program disciplines that contribute to expected learning outcomes

Competence code	Competence	Previous disciplines*	Subsequent disciplines*
GC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, to develop a strategy of actions	Applied Ecology, Fundamentals of Environmental Sciences.	
GC-2	GC-2. Able to manage the project at all stages of its life cycle		
SPC-4	SPC-4. Able to carry out activities for the protection, use, monitoring and restoration of biological resources, using knowledge of the laws and methods of general and applied ecology		
GC-6	Able to determine and implement the priorities of their own activities and ways to improve it based on self-assessment		Research work in the term including projects / Industrial / pedagogical practice Research work on thesis State Exam degree Diploma

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The course workload of «Green economy and sustainability assessment tools» is 4 credits.

Table 4.1. Academic activities during the period of the HE programme mastering for **FULL-TIME EDUCATION**

Academic activities	Total hours	Semesters							
		1	2	3	4	5	6	7	8
Contact academic hours									
Including:									
<i>Lectures</i>	17			17					
<i>Seminars (workshops/tutorials)</i>	17			17					
<i>Lab work</i>	-								
<i>Self-study, academic hours</i>	74			74					

Evaluation and assessment (exam or pass/fail grading)		36			36					
Total course workload	hours	144			144					
	credits	4			4					

5. COURSE MODULES AND CONTENTS

Table 5.1 Modules and Topics

Subject	Green Economy and Sustainability Assessment Tools
Discipline volume	4 4E (144 hours)
Discipline outline	
Module	Topic
1. Sustainability and circular economy	Basic principles of the circular economy. Circular economy model. Infrastructure of the circular economy. Theoretical foundations of the circular economy. Formation of the subject area, concept and features. The concept of "cradle to cradle". The model of the circular economy and the stages of its formation. Indicators of sustainable development in the field of waste management. Basic principles of the circular economy in the field of waste management.
2. Climate-neutral resource management	Contribution of the waste management sector to the Earth's climate. Water resources and climate change. Adaptation and mitigation strategies.
3. Cleaner production	Drinking Water treatment. Water properties, water treatment stages.
4. Green technologies in wastewater treatment	Basic characteristics of wastewater. Oil and grease. Other important wastewater characteristics. Aerobic, anoxic, anaerobic biological treatment. Aerobic biological treatment. Anoxic biological treatment. Anaerobic biological treatment. Microorganisms in wastewater. Biological cells. Ecology of biological wastewater treatment. Reaction kinetics.

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1 Classroom equipment and technology support requirements

Classroom for Academic Activity Type	Classroom equipment	Specialized educational/laboratory equipment and materials for mastering the module
Seminar room	Equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), Skype.	Multimedia equipment, internet, computers with access to EIEE.
Self-studies classroom	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the EIEE.	Multimedia equipment, internet, computers with access to EIEE.

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading sources

1. Kanianska R. Green Growth and Green Economy. Textbook to the course Green growth and green economy. Belianum: Banská Bystrica. 2017.
2. Barbier E. B., Markandya A. A new blueprint for a green economy. Routledge. 2013. URL: <https://doi.org/10.4324/9780203097298>
3. Haab T. C., Whitehead J. C. Environmental and natural resource economics: An encyclopedia // T. C. Haab, J. C. Whitehead, J. L. Caviglia, P.E. Chambers, M.G. Interis. –California: Geenwood – 2014. 357 p.

Additional reading

1. Worldwatch Institute: State of the World 2015: Confronting Hidden Threats to Sustainability, Washington, DC (Island Press). – 2015-
2. Mazmanian D.A. and Kraft M.E. eds. Toward sustainable communities: Transition and transformations in environmental policy. MIT Press. – 2009.
3. Bina O. The green economy and sustainable development: an uneasy balance? // Environment and Planning C: Government and Policy. 2013. T. 31, no 6. URL: <https://doi.org/10.1068/c1310j>
4. Kasztelan A. Green growth, green economy and sustainable development: terminological and relational discourse // Prague Economic Papers. 2017. – T. 26. URL: <https://www.ceeol.com/search/article-detail?id=686936>
5. Mikhno I., Koval V., Shvets G., Garmatiuk O., Tamošiūnienė R. Green economy in sustainable development and improvement of resource efficiency // Central European Business Review (CEBR). 2021. – T. 10. URL: <https://www.ceeol.com/search/article-detail?id=941002>

Internet-based sources

www.greengrowthknowledge.org – Green Growth Knowledge Partnership
www.oecd.org – Organisation for Economic Co-operation and Development

www.greeneconomycoalition.org – Green Economy Coalition
www.gggi.org – Global Green Growth Institute
www.eea.europa.eu – European environment agency
www.mnr.gov.ru – site of the Ministry of Natural Resources of the Russian Federation;
www.unep.org – site of the United Nations Environment Programme;

Learning toolkits for self- studies in the RUDN LMS TUIS

1. A course of lectures on the discipline "Green Economy and Sustainability Assessment Tools".
2. Tasks for practical work

8. EVALUATION MATERIALS AND SCORE-RATING SYSTEM FOR ASSESSING THE LEVEL OF FORMATION OF COMPETENCES IN THE DISCIPLINE

Evaluation materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "Green Economy and Sustainability Assessment Tools" are presented in the Appendix to this Work Program of the discipline.

* - evaluation toolkit and ranking system are formed on the basis of the requirements of the relevant local regulatory act of the RUDN (regulations / order).

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**DEPARTMENT OF ENVIRONMENTAL SAFETY AND PRODUCT
QUALITY MANAGEMENT**

APPROVED

Department meeting protocol No _____,

Date _____
day, month, year

Head of Educational Department

_____(name and surname)
signature

Assessment and Evaluation Toolkit

ON THE COURSE

GREEN ECONOMY AND SUSTAINABILITY ASSESSMENT TOOLS

Direction 44.04.02 Psychological and pedagogical education

Programme:

Environmental Pedagogy

Qualification of the graduate –

Master in Environmental Pedagogy

Passport to Assessment Toolkit

Direction 44.04.02 «Psychological and pedagogical education»:

Course: GREEN ECONOMY AND SUSTAINABILITY ASSESSMENT TOOLS

Assessment and Marking Criteria

Competence	Course modules	Assessment tools				
		Class activities			Self-study	Exam
		Test	Control work	Class work	Seminar report	
GC-1 GC-2 GC-6 SPC-4	Sustainability and circular economy	4	5	6	5	
GC-1 GC-2 GC-6 SPC-4	Climate-neutral resource management	4	5	6	5	
GC-1 GC-2 GC-6 SPC-4	Cleaner production	4	5	6	5	
GC-1 GC-2 GC-6 SPC-4	Green technologies in wastewater treatment	4	5	6	5	
Total Score		16	20	24	20	20

Compliance of assessment systems (previously used assessments of the final academic performance, ECTS assessments and the point-rating system (PRS) of assessments of current academic performance) (In accordance with the Order of the Rector No. 996 of December 27, 2006):

Score (PRS)	Traditional performance grading in Russia	Points for transferring grades	Score	Score ECTS
86 - 100	5	96 - 100	5 +	A
		86-95	5	B
69-85	4	69-85	4	C
51-68	3	61-68	3+	D

		51-60	3	E
0-50	2	36-50	2+	FX
		0-35	2	F
51 -100	Passed		Passed	Passed

Deciphering of grades is also accepted according to the specified document:

- A: "Excellent" - the theoretical content of the course has been mastered completely, without gaps, the necessary practical skills for working with the mastered material have been formed, all the training tasks provided for by the training program have been completed, the quality of their implementation has been estimated by a number of points close to the maximum.
- B: "Very good" - the theoretical content of the course is mastered completely, without gaps, the necessary practical skills for working with the mastered material are basically formed, all the training tasks provided for by the training program are completed, the quality of most of them is estimated by a number of points close to the maximum.
- C: "Good" - the theoretical content of the course has been mastered completely, without gaps, some practical skills in working with the mastered material have not been sufficiently formed, all the training tasks provided for by the training program have been completed, the quality of none of them has been assessed with a minimum number of points, some types of tasks have been completed with mistakes.
- D: "Satisfactory" - the theoretical content of the course has been partially mastered. but the gaps are not significant, the necessary practical skills for working with the mastered material are basically formed, most of the training tasks provided for by the training program have been completed, some of the completed tasks may contain errors.
- E: "Mediocre" - the theoretical content of the course is partially mastered, some practical work skills are not formed, many training tasks provided for by the training program are not completed, or the quality of some of them is estimated by a number of points close to the minimum.
- FX: "Conditionally unsatisfactory" - the theoretical content of the course has been partially mastered, the necessary practical skills have not been formed, most of the training tasks provided for by the training program have not been completed, or the quality of their performance has been assessed with a number of points close to the minimum; with additional independent work on the course material, it is possible to improve the quality of the implementation of educational tasks.
- F: "Definitely unsatisfactory" - the theoretical content of the course has not been mastered, the necessary practical skills have not been formed, all completed training tasks contain gross errors, additional independent work on the course material will not lead to any significant improvement in the quality of the training tasks.

Typical control tasks or other materials necessary to assess knowledge, skills and (or) experience of activities, characterizing the formation stages of competencies in the process of mastering the educational course



Questions to prepare for certification






1. What is the difference between the concept of a Green Economy and Sustainable Development?
2. What are the implications of a Green Economy for poverty reduction?
3. What does the Green Economy imply for biodiversity conservation?
4. What implication does a Green Economy have on the notion of economic growth?
5. What work must be done during the transition to a green economy?

6. What goals have been identified for sustainable economic recovery after the pandemic?
7. What support has been shown for the *We Are Still In Declaration*, in agreement with the Paris Climate Agreement and its green economic goals?
8. Climate Change and Carbon Management
9. Biodiversity and Ecosystem Services
10. Green Technology and Renewable Energy
11. Environmental Law and Social Justice
12. Linkage between energy use, pollution and economic growth
13. Economic Indicators for Material Recovery Estimation
14. Assessment of mechanisms and instruments of climate finance
15. Challenges and opportunities at the crossroads of Environmental Sustainability and Economy research
16. Practices on Cleaner Production and Sustainability
17. Drivers and Barriers to Cleaner Production
18. Integrated process technology for recycling and re-use of industrial and municipal wastewater
19. Physicochemical–biotechnological approaches for removal of contaminants from wastewater

Self-study Topics

1. Hold a brainstorm session, using the Rules of Brainstorming, to generate ideas for changing the business model from a one-time purchase to a service for lifetime and sharing, where your company somehow stays involved in the life cycle of the product.
 - You do not need to work off your Whole System Map, but you might find it helpful, especially to see how services could connect other parts of the system.
 - List at least 30 ideas.
 - For each service idea, list the added value for the customer that that service provides, compared with just purchasing the product. (Does it save the user money, either that one time or in the long run? Does it help the user avoid financial or physical or other risk? Does it provide the user more convenience? Something else?) Don't write long notes, just a few words like "more convenient" or "lower one-time cost".
 - For each service idea, list the added value for you (the manufacturer and/or service provider), compared with just selling the product.
2. Following the Conceptual Map activity, launch the discussion on adaptation and mitigation by watching the video capsule called "Climate change adaptation: It's time for decisions now" (GIZ online) at www.youtube.com/watch?v=FO46sPwm4xk.
3. What type of measure does each example below represent: adaptation or mitigation? Justify your answer.

	Adaptation	Mitigation
 <p>Designate more forests as protected areas.</p>		
 <p>Improve roads, bridges and building design to resist weather damage.</p>		

	Protect homes and buildings from flooding.		
	Invest in ways to absorb rainwater, like « green » roofs and porous driveways.		
	Promote water and energy conservation.		
	Invest in or provide rebates for energy-efficient fridges, furnaces, and appliances.		
	Promote cycling, walking and taking transit as alternatives to driving.		

4. How could your company benefit from improved environmental performance? (Think about time and cost savings, reduced risks and liabilities, increased employee morale, added value to customers, etc.)
5. Name five examples of environmental wastes you could reduce at your company.
6. Review the following information and then answer the questions below.

The —Honest Abe is a traditional country-style restaurant in the center of Chicago. Since 1876, guests have come from near and far to enjoy the famous mashed potatoes served at the Honest Abe. Let’s take a look inside the kitchen and observe how the mashed potatoes are —produced. First, the raw, gritty potatoes are washed and peeled. Old Joe, who helps out in the kitchen, is responsible for peeling the potatoes, and this is how he spends most of his working hours. After so many years of this tedious task, he’s not exactly thrilled by the job. The peels are thrown in a large trashcan, along with the other garbage from the kitchen. Nellie, the ancient cleaning lady, empties the trash into the dumpster out back at the end of each day. The peeled potatoes are cooked in a large pot that is always filled to the brim with water. This makes it easier for the cook to measure the salt: 2 heaping teaspoons of salt in every full pot. There are two old electric ranges in the kitchen, upon which two pots full of water are constantly boiling. The cook claims it’s faster to cook the potatoes like this, especially since orders are continuously streaming into the kitchen. It wouldn’t make sense to keep turning the stove on and off. The potatoes have to be cooked for exactly 20 minutes. The cooking water is poured down the drain, and Joe lets the potatoes cool down enough for him to mash them. It takes a little while for the waiter to pick up the finished potatoes. And at lunchtime, the restaurant is so full that he barely has time to serve everyone. Sometimes (—hardly ever, according to the waiter), the potatoes arrive at the table so cold that the customer refuses to eat them and sends them back. That doesn’t really bother the waiter, who has worked here for ages. Nellie is ready at the sink to clean the plate, toss the potatoes and sing a song about the good old days.

 - a. What is the end product desired by the customer?

- b. What material, energy and water inputs are required in the production process?
 - c. Which of these inputs are not components of the desired end product (e.g. NonProduct Outputs - NPOs)?
 - d. Who participates, either directly or indirectly, in creating these NPO's?
 - e. Which information would be necessary to quantify the NPO streams? f. What are the costs generated by the NPO's?
 - g. What are the possible environmental effects of the NPO's?
 - h. What are the causes for the creation of the NPO's?
 - i. What measures could help to reduce the NPO streams?
7. Choose an environmental waste or risk problem area that you know exists or likely exists at your facility (it can be a problem you identified in a previous exercise such as the mental facility walk-through or in Chapter 2) and use one of the tools described above (5 whys, fishbone diagram, or process mapping) to identify the root cause of the problem. Does this help to identify any solutions?
 8. Identify specific opportunities to implement CP actions at your facility using the following methods: Visual controls, Right-sized equipment and containers, Total productive maintenance.

Didactic materials defining the procedures for assessing and evaluating knowledge, skills, and activity skills, characterizing the formation stages of competencies.

As part of practical classes, problematic seminars, conversations, discussions, workshops and other forms of interactive classes are delivered. The current control of the development of the discipline is carried out in the form of oral surveys, problematic classes, assessment of the activity of students during discussions, consultations, workshops, and the execution of a clause. Criteria for achieving learning outcomes for current control: confident solution of tasks by students, with the appearance of logical and predictable questions and difficulties; application of acquired knowledge in new, non-standard situations. Intermediate certification based on the results of mastering the discipline - a test with an assessment based on the results of presenting a report and / or publication in a student collection. The criteria for achieving learning outcomes in the discipline for intermediate control is the confident presentation of the results of independent research in the form of a report and / or publication in a student collection.

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