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**Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA
(RUDN University)**

Institute of Environmental Engineering

COURSE SYLLABUS

Carbon Credits Markets

Recommended by the Didactic Council for the Education Field of:

05.04.06 "Ecology and Nature Management"

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

Climate Projects Management

1. COURSE GOAL(s)

The course is designed to help students to obtain the complex theoretical and applied knowledge in carbon credits selling and trading using international methodological approaches and standards, acquiring skills in the field carbon capture and storage, as well as studying the conditions and possibilities for global and regional carbon markets functioning.

• 2. REQUIREMENTS FOR LEARNING OUTCOMES

The process of studying the discipline is aimed at the formation of the following competencies:

Competence code	Competence descriptor	Competence formation indicators
GC-2	Able to manage a project at all of its life cycle stages	GC-2.1 can formulate a project task based on the problem posed and a way to solve it
		GC-2.2 can develop the project concept, formulate its goal and objectives, argue the relevance, expected outcomes and scope of their application
		GC-2.3 can develop a project roadmap taking into account possible risks and necessary resources
PC-2	Able to develop and economically argue plans for the new environmental equipment and technology's introduction to achieve enterprise carbon neutrality	PC-2.1 knows the environmental forecasting basics when introducing new environmental equipment and technologies into an enterprise
PC-3	Able to develop measures for the economic regulation of the enterprise's environmental performance, as part of the transition to a low-carbon economy	PC-3.1 knows approaches to formulate and economically argue the management decisions on mitigation and adaptation to climate change
		PC-3.2 able to determine the economic efficiency of climate projects
		PC-3.2 owns the skills to prepare documentation for trading the carbon units

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

Course *Carbon Credits Markets* refers to the **University Disciplines Module** block 1 of the curriculum.

Within the higher education programme students also master other disciplines (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course.

Table 3.1

The list of the higher education programme components that contribute to the achievement of the expected learning outcomes

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
GC-2	Able to manage a project at all of its life cycle stages	No	No

PC-2	Able to develop and economically argue plans for the new environmental equipment and technology's introduction to achieve enterprise carbon neutrality	Environmental Engineering and Climate Change	
PC-3	Able to develop measures for the economic regulation of the enterprise's environmental performance, as part of the transition to a low-carbon economy	No	Low-carbon Economy Ecosystem Services for Climate Change Mitigation

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course is 4 credit units.

Table 4.1. Types of academic activities during the period of the HE program(me) mastering

Types of academic activities	Total hours	Semester(s)			
		1	2	3	4
<i>Contact academic hours</i>					
Lectures	17			17	
Lab works					
Seminars (workshops/tutorials)	17			17	
<i>Self-study</i>	83			83	
<i>Evaluation and assessment (exam; pass/fail grading)</i>	27			27	
The total course workload	hours	144		144	
	credits	4		4	

5. COURSE CONTENTS

Table 5.1. The content of the discipline (module) by type of educational work

Title of Course Modules	Content	Types of academic activities
Module 1. Global Trends in Carbon Markets Development	Topic 1.1. Concept framework for Carbon Markets Development. From Kyoto Protocol to Article 6 of the Paris Agreement. EU Emissions Trading Scheme	L, S
	Topic 1.2. Mandatory carbon markets. National and regional markets. Voluntary carbon markets. Local governments and carbon markets	L, S
Module 2. International Carbon Credits Standards	Topic 2.1. Clean Development Mechanisms Standards	L, S
	Topic 2.2. Climate, Community and Biodiversity (CCB) Standard. Carbon Verified Standard.	L, S
	Topic 2.3. Golden Standard	L, S
Module 3. Life Cycle of Carbon Projects	Topic 3.1. Project Concept & Financing	L, S
	Topic 3.2. Project Development and Monitoring: Implementation and Monitoring. Project Registration. Project Validation	L, S

Title of Course Modules	Content	Types of academic activities
	Topic 3.3. Credits Issuance & Sales: Credit Verification.	L, S

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, software and materials for mastering the course (if necessary)
Lecture	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection.
Seminars	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless	Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), Skype. Microsoft Windows 7 corporate. License No. 5190227, date of issue March 16, 2010 MS Office 2007 Prof, License # 6842818, date of issue 09/07/2009
For Self-Study	Classroom for self-study (can be used for seminars and consultations), equipped with a set of devices includes laptop, stable wireless.	No

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main reading:

1. Pinaev VE, Ledascheva TN Environmental support of projects in Russia – modern practices. 2nd edition Монография – М.: Мир науки, 2022 – Режим доступа: <https://izd-mn.com/PDF/41MNNPM22.pdf> – Загл. с экрана.
2. Handbook for CCS Carbon Credits. Workshop report of “Global Carbon Market and CCS:Towards ASEAN Decarbonization”. – JOGMEC, Japan. – 2024 – 52 p. (available on TUIS)
3. Haya, B. K., Alford-Jones, K., Anderegg, W. R. L., Beymer-Farris, B., Blanchard, L., Bomfim, B., Chin, D., Evans, S., Hogan, M., Holm, J. A., McAfee, K., So, I. S., West, T. A. P., & Withey, L. Quality assessment of REDD+ carbon credit projects. Berkeley Carbon Trading Project. – 2023 – 205 p. (available on TUIS)

Additional reading:

1. Handbook for CCS Carbon Credits. Workshop report of “Global Carbon Market and CCS: Towards ASEAN Decarbonization”. – JOGMEC, Japan. – 2024. – 52 p. (available on TUIS)

2. Haya, B. K., Alford-Jones, K., Anderegg, W. R. L., Beymer-Farris, B., Blanchard, L., Bomfim, B., Chin, D., Evans, S., Hogan, M., Holm, J. A., McAfee, K., So, I. S., West, T. A. P., & Withey, L. Quality assessment of REDD+ carbon credit projects. Berkeley Carbon Trading Project. – 2023. – 205 p. (available on TUIS)

3. Document of GSV of 12.2006. «The Gold Standard Validation & Verification Manual for CDM Projects». 74 p.

4. Document of GSV of 12.2012. « The Gold Standard Requirements – version 2.2». 53 p.

5. Document of CDM of 2019 CDM-EB50-A30-STAN «Standard: Sampling and surveys for CDM project activities and programmes of activities. Version 08.0». 80 p.

6. Document of CDM of 2017. TOOL27 «Methodological tool: Investment analysis. Version 08.0». 17 p.

7. Document of CDM of 23.11.2012. TOOL01 «Tool for the demonstration and assessment of additionality, Version 7.0.0». 16 p.

8. Document of CDM of 22.09.2017. TOOL02 «Combined tool to identify the baseline scenario and demonstrate additionality. Version 7.0, 2017». 18 p.

9. Pinaev VE Ledascheva TN Environmental impact fee calculation in Russia for EIA – modern practices. 2nd edition. Учебное пособие – М.: Мир науки, 2022 – Режим доступа: <https://izd-mn.com/PDF/39MNNPU22.pdf> — Загл. с экрана.

Internet-based sources

1. ELS of RUDN University and third-party ELS, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System - RUDN EBS <http://lib.rudn.ru/MegaPro/Web>

- ELS "University Library Online" <http://www.biblioclub.ru>

- EBS Yurayt <http://www.biblio-online.ru>

- ELS "Student Consultant" www.studentlibrary.ru

- EBS "Lan" <http://e.lanbook.com/>

- EBS "Trinity Bridge"

2. Databases and search engines:

- electronic fund of legal and normative-technical documentation <http://docs.cntd.ru/>

- Yandex search engine [https:// www .yandex.ru/](https://www.yandex.ru/)

- Google search engine <https://www.google.ru/>

- abstract database SCOPUS [http:// www .elsevierscience.ru/ products / scopus /](http://www.elsevierscience.ru/products/scopus/)

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system to evaluate the level of competences (competences in part) formation as results of mastering the discipline are specified in the Appendix to the syllabus.

DEVELOPER:

Associate Professor of the
ES&PQM Department

Position

Pinaev V.E.

Signature

Name, Surname

HEAD OF DEPARTMENT:

Director of ES&PQM Department

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Savenkova E.V.

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HEAD OF PROGRAMME:

Director of ES&PQM Department

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Savenkova E.V.

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**Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE
LUMUMBA
(RUDN UNIVERSITY)**

Institute of Environmental Engineering

ASSESSMENT TOOLKIT

Carbon Credits Markets

**Recommended by the Didactic Council for the Education Field of:
05.04.06 "Ecology and nature management"**

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

Climate Project Management

Passport to Assessment Toolkit for Course Carbon Credits Markets

Education Field / Speciality 05.04.06 "Ecology and nature management"/ «Climate Project Management»

Course: Carbon credits markets

Competences (competences in part) under assessment	Course module under assessment	Course topic under assessment	Tools to assess higher education programme mastering level									Points for topic	Points for course	
			Class work					Self-studies						Exam/Pass-fail assessment
			Quiz	Test	Work with lecture materials	Work at the seminars	Lab work	Homework	Research essay/ Library research paper	Calculation and graphic work	Group work project			
GC-2	Module 1. Global Trends in Carbon Markets Development	Topic 1.1. Concept framework for Carbon Markets Development. From Kyoto Protocol to Article 6 of the Paris Agreement. EU Emissions Trading Scheme	1	2	1	2						1	7	14
		Topic 1.2. Mandatory carbon markets. National and regional markets. Voluntary carbon markets. Local governments and carbon markets	1	2	1	2						1	7	

PC-2 PC-3	Module 2. International Carbon Credits Standards	Topic 2.1. Clean Development Mechanisms Standards	2	2	1	2					2	9	27
		Topic 2.2. Climate, Community and Biodiversity (CCB) Standard. Carbon Verified Standard.	2	2	1	2					2	9	
		Topic 2.3. Golden Standard	2	2	1	2					2	9	
PC-2 PC-3	Module 3. Life Cycle of Carbon Projects	Topic 3.1. Project Concept & Financing	2	2	1	2				10	2	19	59
		Topic 3.2. Project Development and Monitoring: Implementation and Monitoring. Project Registration. Project Validation	2	4	1	2				10	2	21	
		Topic 3.3. Credits Issuance & Sales: Credit Verification.	2	2	1	2				10	2	19	
		TOTAL	14	18	8	16				30	14	100	100

Course Carbon Credits Markets

QUESTION CARD No 1

QUESTION 1. Carbon Units Calculation: Methodological basics.

QUESTION 2. Clean Development Mechanism Standards.

3 *

Developer _____ (Pinaev Vladimir)
signature

Head of Educational Department _____ (Savenkova Elena)
signature

day, month, year

Note * Practice case/task inclusion is subject to the teacher's discretion.

The set of exam question cards is complemented by the assessment criteria developed by the teacher and approved at the department meeting.

Assessment criteria:

(in compliance with the legal regulations in force)

EXAM QUESTIONS

1. Monitoring Plan development for GHG projects.
2. Baseline establishment for GHG projects.
3. Validation and verification of GHG projects.
4. Global trends in carbon markets development.
5. Carbon Capture and Storage.
6. Carbon Units Calculation: Methodological basics.
7. Clean Development Mechanism Standards.
8. Golden Standard.
9. Carbon Verified Standard.
10. Mandatory carbon markets.
11. Voluntary carbon markets.
12. Life Cycle of Carbon Projects.
13. LCA for the carbon footprint calculation.
14. Carbon credits and offsets.
15. Carbon projects types.
16. Technical feasibility of carbon projects.
17. Financial feasibility of carbon projects.
18. Credits sales. Direct sales. Brokered sales. Exchanges sales.
19. Carbon credit standard selection.
20. Carbon markets development and low-carbon economy.

Tentative list of assessment tools

No	Assessment tool	Brief features	Assessment tool representation in the kit
<i>Class work</i>			
1	Survey/Quiz	A tool of control, organised as a special conversation between a teacher and students on topics related to the course under study, and designed to clarify the amount of students' knowledge in a particular section, topic, problem, etc.	Questions on the course topics /modules
2	Test	A system of standardised tasks that allows the teacher to automate the procedure for measuring the student's level of knowledge and skills	Tests bank
3	Control work	A tool of control organised as a classroom lesson, at which students need to independently demonstrate the acquisition and mastering of the educational material of the course topic, section, or sections.	Questions on the course topics /modules
4	Round table, discussion, polemic, dispute, debate, (class work)	Evaluation tools that allow the teacher to engage students in the process of discussing controversial issues, problems and assess their ability to argue their own point of view.	List of themes for round tables, discussions, polemics, disputes, debates.
5	Business game and/or role play	Joint activities of a student group under the teacher's control to solve educational and professionally oriented tasks through the simulation of a real-world problem; this activity allows the teacher to assess the students' ability to analyse and solve typical professional challenges.	Topic (problem), concept, roles and expected results for each game
6.	Presentation (defence) of project/report/ Library research paper /briefs *	A tool for monitoring the students' ability to present the work results to the audience.	Themes for projects/reports/ Library research paper/ briefs
7	Pass/Fail assessment	A tool for checking the quality of students' performance of laboratory work, acquisition and mastering of the practice training and seminar educational material, successful completion of the advanced field internship and pre-graduate internship and fulfillment of all training assignments in the course of these internships in accordance with the approved programme.	Tasks examples
8	Exam	The evaluation of the student's work during the semester (year, the entire period of study, etc.); it is designed to identify the level, soundness and systematic nature of theoretical and practical knowledge gained by the student, formation of independent work skills, development of creative	Examples of tasks/questions/exam question cards

		thinking, ability to synthesise the acquired knowledge and apply it to solve practice tasks.	
9	Case	A problem-solving task in which the student is asked to comprehend the real work-related (occupational) situation necessary to solve the problem.	Assignments to solve the case
10	Multi-level tasks and assignments with varying difficulty	The tasks and assignments differ in terms of the following levels: a) reproductive level allows the teacher to evaluate and diagnose the students' knowledge of factual material (basic concepts, algorithms, facts) and the students' ability to correctly use special terms and concepts, recognize objects of study within a certain section of the discipline, b) reconstructive level allows the teacher to evaluate and diagnose the students' abilities to synthesise, analyse, generalise factual and theoretical material and formulate specific conclusions, establish cause-and-effect relationships, c) creative level allows to evaluate and diagnose students' skills to integrate knowledge of various fields, argue their own point of view.	Set of multi-level tasks and assignments with varying difficulty
<i>Self- studies</i>			
1	Calculation and graphic work	A tool for checking students' skills in applying the acquired knowledge according to a predetermined methodology in task solving or fulfilling assignments for a module or discipline as a whole.	Set of tasks for calculation and graphic work
2	Course work/project	A type of independent written work aimed at the creative development of general professional and specialised professional disciplines (modules) and the development of relevant professional competences	Course assignment themes
3	Project	The final "product" that results from planning and performance of educational and research tasks set; it allows the teacher to assess the students' ability to independently shape their knowledge in the course of solving practice tasks and problems, navigate in the information environment and the students' level of analytical, research skills, skills of practical and creative thinking; it can be implemented individually or by a group of students.	Themes for team-based or individual projects
4	Reports, briefs	The product of the student's independent work, which is a public performance on the presentation of the results of solving a specific educational, practical, research or scientific topic.	Themes for reports, briefs
5	Standard calculations	A tool to test skills in applying the acquired knowledge, according to a predetermined methodology, solving tasks or fulfilling	Set of tasks for standard calculations

		assignments for a module or discipline as a whole.	
6	Homework	<p>The tasks and assignments differ in terms of the following levels:</p> <p>a) reproductive level allows the teacher to evaluate and diagnose the students' knowledge of factual material (basic concepts, algorithms, facts) and the students' ability to correctly use special terms and concepts, recognize objects of study within a certain section of the discipline,</p> <p>b) reconstructive level allows the teacher to evaluate and diagnose the students' abilities to synthesise, analyse, generalise factual and theoretical material and formulate specific conclusions, establish cause-and-effect relationships,</p> <p>c) creative level allows the teacher to evaluate and diagnose students' skills to integrate knowledge of various fields, argue their own point of view.</p>	Set of multi-level tasks and assignments with varying difficulty

Department of Environmental Safety and Product Quality Management

Set of assignments for control work

for the course Carbon Credits Markets

Carbon credit is ...

credit in International Carbon Bank
permits that allow the owner to emit a certain amount of carbon dioxide or other greenhouse gases (GHGs)
the amount of GHG emissions of enterprise per year
estimated CO₂ emissions at all stages of product life cycle

Clean Development Mechanism is ...

a United Nations-run carbon offset scheme
MENA carbon offset scheme
EU carbon offset scheme
Latin America carbon offset scheme

Which tool can be used to determine the GHG program's compliance with VCS Program principles and requirements and to assess whether the GHG emission reductions or removals issued under the GHG Program are fully compatible with VCUs?

GIS analysis
Life cycle assessment
Gap analysis
Investment analysis

Assessment criteria:

(in compliance with the legal regulations in force)

Department of Environmental Safety and Product Quality Management

Business game

for the course Carbon Credits Markets

1 Theme (problem): Carbon markets development: pros and cons

2 Game conception: the establishment of benefits and disadvantages in regards to global and local carbon markets development for different stockholders

3 Roles:

- government;
- society
- non-profit organizations;
- entrepreneurs
- bank organizations etc.

4 Expected outcomes:

- Business game helps students to obtain deep understanding of:
- the main approaches to global and local carbon markets development;
 - the basic principles and tools of carbon markets functioning;
 - the limits for global carbon market establishment.

Assessment criteria:

(in compliance with the legal regulations in force)

Developer _____ (Vladimir Pinaev)
signature

day, month, year

Department of Environmental Safety and Product Quality Management

Team-based or individual creative assignments/projects

for the course Carbon Credits Markets

As part of climate combat actions, understanding the products' footprint from their structure to get as accurate as possible view has become increasingly important.

A product's carbon footprint refers to the total amount of GHG emissions generated throughout its life cycle, from raw material extraction to disposal. In this context, the development of carbon footprint estimation helping companies make informed decisions regarding sustainable methods of production.

The purpose of the project is to calculate the carbon footprint of selected enterprise using software Open LCA.

Algorithm

1. Select the enterprise.
2. Establish the scope, boundary of production system, functional unit and cut-off rules.
3. Perform the inventory analysis (input and output fluxes of substances).
4. Define as impact category – climate change potencial.
5. Make the data classification.
6. Calculate the values of indicators of categories (data characterization).
7. Make the data normalization.
8. Perform the assessment of significance, grouping, weighing.
9. Interpretate the data in the assessment of the life cycle of products. Analyze the carbon footprint of the product.

Task defense form – Power Point presentation of the report.

Assessment criteria:

(in compliance with the legal regulations in force)

Developer _____ (Anna Popkova)
signature

day, month, year

DEVELOPER:

Associate Professor of the
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