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

Academy of Engineering

(name of the educational division - developer of the HEP HE)

COURSE SYLLABUS

Sustainable Mining

(Subject / Course title)

Recommended by the Didactic Council for the Education Field of:

05.04.01 Geology

(code and name of the Higher Education Field)

The development of the discipline is carried out within the framework of the implementation of the Higher Education Programme of Higher Education (HEP HE):

Mining Geology

(name (profile/specialization) of the Higher Education Program)

1. AIMS AND OBJECTIVES

The purpose of mastering the discipline “Sustainable Mining” is:

- acquiring knowledge, skills and experience in the field of designing all stages of the life cycle of mining enterprises and extractive regions as a whole based on the principles of sustainable development that characterize the stages of competence formation and ensuring the achievement of the planned results of the educational programme.

The main objectives of the discipline are:

- formation of a system of knowledge among students necessary for understanding and explaining the principles of sustainable development;
- studying the fundamentals of the analysis of reserves and bottlenecks of sustainable development at the global, national and regional levels;
- study and analysis of the features of mining regions in the concept of sustainable development.

2. REQUIREMENTS TO LEARNING OUTCOMES

Mastering the discipline “Sustainable Mining” is aimed at developing the following competencies (parts of competencies) among students:

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

Code	Competence	Competence Formation Indicators (within this discipline)
GC-3.	Able to organize and manage the work of the team, developing a team strategy to achieve the goal.	GC-3.1 Defines his/her role in the team based on a collaborative strategy to achieve the goal;
		GC-3.2 Exchange information, knowledge, and experience with team members;
		GC-3.3 Argues his/her point of view regarding the use of other team members' ideas to achieve the goal set.
GPK-3.	Accomplished of totally independent generalizing the results obtained while solving professional problems and developing recommendations for their practical application.	GPK-3.1 Know the theoretical foundations of the generalization of results and development of recommendations;
		GPK-3.2. be able to summarize the results obtained in the process of solving professional tasks, develop recommendations for their practical use;
		GPK-3.3. Have the skills to summarize the results obtained in the process of solving professional tasks and develop recommendations for their practical use.
GPK-4.	Suitable of representing, protecting, and disseminating the outcomes of their professional activities.	GPK-4.1 Knows the main results of his/her scientific activity, methods of their presentation, protection and dissemination;
		GPK-4.2. is able to understand and analyze the results of professional activities, use own scientific achievements. discuss and disseminate the results of their professional activities.
		GPK-4.3. Have the skills to analyze, discuss and disseminate the results of professional activities
GPK-5.	Proficient of conducting critical analysis and utilizing	GPK-5.1. Knows the basics of digital economy, basic methods of critical analysis, principles of systems approach;

Code	Competence	Competence Formation Indicators (within this discipline)
	a systematic approach in the field of digital economy.	GPK-5.2. Knows how to critically analyze information, understand the principles of systems approach; GPK-5.3. Knows how to critically analyze and apply systems approach to the digital economy.

3. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF HEP HE

Discipline “Sustainable Mining” refers to the Variable Component of block B1 of the HEP HE.

As part of the HEP HE, students also master other disciplines and / or practices that contribute to the achievement of the planned results of mastering the discipline “Sustainable Mining”.

Table 3.1. The list of components of the HEP HE that contribute to the achievement of the planned results of the development of the discipline

Code	Competence	Previous Disciplines (Modules)*	Subsequent Disciplines (Modules)*
GC-3.	Able to organize and manage the work of the team, developing a team strategy to achieve the goal.		Final state attestation
GPK-3.	Accomplished of totally independent generalizing the results obtained while solving professional problems and developing recommendations for their practical application.		Research Work (Mining Geology). Part 1; Research Work (Geological and Geophysical Survey). Part 1; Research Work (Mining Geology). Part 2; Research Work (Geological and Geophysical Survey). Part 2; Final state attestation
GPK-4.	Suitable of representing, protecting, and disseminating the outcomes of their professional activities.	Digital Technologies in Geology;	Research Work (Mining Geology). Part 2; Research Work (Geological and Geophysical Survey). Part 2; Final state attestation
GPK-5.	Proficient of conducting critical analysis and utilizing a systematic approach in the field of digital economy.		Final state attestation

* - filled in in accordance with the matrix of competencies and academic curriculum of HEP HE

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

Course workload “Sustainable Mining” is 5 credit units.

Table 4.1. Types of academic activities during the period of the HE programme mastering

Type of academic activities	TOTAL, ac. hrs.	Semester
		2
<i>Contact academic hours</i>	51	51
Lectures	17	17
Lab work	-	-
Seminars (workshops/tutorials)	34	34
<i>Self-study (ies), academic hours</i>	93	93
<i>Evaluation and assessment (exam or pass/fail grading)</i>	36	36 <i>Exam</i>
Course workload	academic hours	180
	credits	5

5. COURSE MODULES AND CONTENTS

Table 5.1. Course Modules and Contents by types of academic activities

Modules	Topics	Type of academic activities*
Section 1. The concept of sustainable development	1.1. Formation of the concept of sustainable development. Global consequences of human influence on the biosphere. 1.2. Globalization of the world community and the role of international cooperation in achieving sustainable development. 1.3. United Nations Conference on Environment and Development. 1.4. Sustainable Development Goals. 1.5. The concept of Russia's transition to sustainable development.	Lec, Sem
Section 2. Aspects of sustainable development	2.1. Industrial Safety. 2.2. Resources and waste. 2.3. Climate problems. 2.4. Forest conservation. 2.5. Problems of the world ocean. 2.6. Urbanization. 2.7. Conservation of biological diversity. 2.8. Economic and legal mechanisms.	Lec, Sem
Section 3. Ensuring sustainable development of the enterprise.	3.1. Types of sustainability: market, production, financial and economic, organizational and managerial. 3.2. Ensuring environmental and social goals. 3.3. Ensuring innovative growth. 3.4. Technological solutions for sustainable development. 3.5. Green technologies.	Lec, Sem

Modules	Topics	Type of academic activities*
Section 4. ESG rating and evaluation criteria.	4.1. Social Criteria 4.2. Corporate Criteria 4.3. Environmental Criteria	Lec, Sem

* - Lec – Lectures; Lab – Lab work; Sem – Seminars (workshops/tutorials).

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 discipline (if necessary)
Lecture	Auditorium for lecture-type classes, equipped with a set of specialized furniture; blackboard (screen) and technical a set of specialized furniture, a board (screen), and technical means of multimedia presentations.	
Computer Lab	Computer lab for conducting classes, group and individual consultations, current control and intermediate attestation, equipped with personal computers (21 pcs. computer class equipped with 21 personal computers, a blackboard (screen) and multimedia devices. technical means of multimedia presentations.	Specialized software: <ul style="list-style-type: none"> • MS Office licensed software package,
Seminars	Auditorium for classes seminars, group and individual consultations, current control and intermediate attestation, equipped with a set of a set of specialized furniture and technical means of multimedia presentations.	
Self-studies	Auditorium for independent work (can be used for seminars and consultations), equipped with a set of a set of specialized furniture and computers with access to the EITS of the university.	

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading(sources):

1. Sustainable management of mining operations / edited by JA Botin., Society for Mining, Metallurgy, and Exploration, Inc. (SME) ISBN-13: 978-0-87335-267-3 Operations-Society-for-Mining-Metallurgy-and-Exploration-SME-2009.pdf)
2. MAKING MINING SUSTAINABLE: OVERVIEW OF PRIVATE AND PUBLIC RESPONSES, PETTER HOJEM, Luleå University of Technology, 2014 (https://www.ltu.se/cms_fs/1.124549!/file/rapport%20making%20mining%20sustainable_low.pdf)
3. UNDP and UN Environment (2018). Managing mining for sustainable development: A sourcebook. Bangkok: United Nations Development Program. ISBN: 978-974-680-421-9 (<https://www.undp.org/publications/managing-mining-sustainable-development>)

Additional (optional) reading (sources):

1. A guide to leading practice sustainable development in mining, leading practice sustainable development program for the Mining Industry, Department of Resources, Energy and Tourism Australian Governance, 2011 ISBN 978-1-921812-49-1 (online PDF)
2. United Nations Economic Commission for Africa. (2017). Impact of illicit financial flows on domestic resource mobilization: Optimizing revenues from the mineral sector in Africa. <https://repository.uneca.org/handle/10855/23862>
3. United Nations Development Program, Columbia Center on Sustainable Investment, Sustainable Development Solutions Network, & World Economic Forum. (2016). Mapping mining to the Sustainable Development Goals: An atlas. <https://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/mappingmining-to-the-sdgs--an-atlas.html>
4. How to Advance Sustainable Mining Suzi Malan, Ph.D. October 2021, <https://www.iisd.org/articles/deep-dive/how-advance-sustainable-mining>
5. Sustainable mining, local communities and environmental regulation Kai Kokko, Arild Buanes, Timo Koivurova, Vladimir Masloboev, Maria Pettersson | Pages 50–81, BARENTS STUDIES: Peoples, Economies and Politics VOL. 2 | ISSUE 1 | 2015
6. <https://lauda.ulapland.fi/bitstream/handle/10024/62260/Kokko%26Buanes%26Koivurova%26Masloboev%26Pettersson.pdf?sequence=2>
7. Salam, A. (2020) Internet of things for sustainable mining. In Internet of Things for Sustainable Community Development (pp. 243-271). Springer, Cham. https://doi.org/10.1007/978-3-030-35291-2_8

Internet-(based) sources:

1. Electronic libraries with access for RUDN students:
 - RUDN Electronic Library System – RUDN ELS <http://lib.rudn.ru/MegaPro/Web>
 - ELS “University Library Online” <http://www.biblioclub.ru>
 - ELS Yurayt <http://www.biblio-online.ru>
 - ELS “Student Consultant” www.studentlibrary.ru
 - ELS “Lan” <http://e.lanbook.com/>

- ELS “Trinity Bridge” <http://www.trmost.ru>

2. Databases and search engines:

- Electronic Fund of Legal and Normative-technical Documentation
<http://docs.cntd.ru/>

- Yandex search engine <https://www.yandex.ru/>

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

- abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

Learning toolkits for self- studies in the RUDN LMS TUIS *:

1. Guidelines for students on the development of the subject “Sustainable Mining”.

2. Course of lectures on the subject “Sustainable Mining”.

* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the subject in LMS TUIS!

8. ASSESSMENT AND EVALUATION TOOLKIT AND GRADING CRITERIA

Assessment and Evaluation Toolkit (AET), Grading System (GS)* for assessing the level of competence (part of competence) for the subject “Sustainable Mining” are presented in the Appendix to the Course Syllabus of the subject.

* - AET and GS are formed on the basis of the requirements of the relevant local normative act of the RUDN University.

DEVELOPERS:

Senior Lecturer, Geology and Survey Department		A. Lipina
Position, Department	Signature	Full name
Associate Professor, Geology and Survey Department		V. Cheskidov
Position, Department	Signature	Full name

HEAD of Department:

Director of the Department of Subsoil Use and Oil&Gas Engineering		A. Kotelnikov
Name of Department	Signature	Full name

HEAD OF HEP HE:

Director of the Department of Subsoil Use and Oil&Gas Engineering		A. Kotelnikov
Position, Department	Signature	Full name