PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA

Institute of Environmental Engineering

(наименование основного учебного подразделения (ОУП)-разработчика ОП ВО)

COURSE SYLLABUS

Simulation and prevention of accidents

(наименование дисциплины/модуля)

Recommended by the Methodological Council for the Education Field:

05.04.06 Ecology and nature management

(код и наименование направления подготовки/специальности)

The discipline is mastered within the framework of the main professional higher education program:

Economics of natural resources management

(наименование (профиль/специализация) ОП ВО)

2024

1. COURSE GOALS

The course goal is to familiarize with modern approaches to the modelling of industrial accidents and their consequences as well as with practice of implementation of models for the decision making.

2. LEARNING OUTCOMES

The mastering of the discipline "Industrial safety" is aimed at the formation of the following competencies (parts of competencies) in students:

Table 2.1. List of competencies formed by students during the development of the discipline (LEARNING OUTCOMES)

Code	Competence	Indicators of competence achievement (within the framework of this discipline)
GPC -2	Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity.	**GPC -2.1** Knows the basics of ecology, geoecology, environmental economics and circular economy, as well as environmental management
		GPC -2.2 Able to use environmental, economic and other special knowledge and algorithms to solve professional problems
		GPC -2.3 Able to find, analyze and competently use the latest information and modern techniques in the performance of research and applied tasks
SPC-6	Able to develop standard environmental measures and assess the impact of planned facilities or other forms of economic activity on the environment	SPC-6.1 Capable of detecting inconsistencies in the state of environmental components with the requirements of national and international standards
		SPC-6.2 Able to develop programs for monitoring natural complexes under conditions of technogenic loads and programs for environmental rehabilitation of territories

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Simulation and prevention of accidents" refers to Compulsory Disciplines of the Higher Education Program.

Within the framework of the higher education program, students also master other disciplines and/or practices that contribute to expected learning outcomes of the discipline "Simulation and prevention of accidents".

Table 3.1. List of Higher Education Program components that contribute to expected learning outcomes

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
GPC -2	Able to use special and new sections of ecology, geoecology and nature	Estimations of natural resources / Оценки природных ресурсов	Environmental standards and nature management / Экологические стандарты и природопользование

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
	management in solving research and applied problems of professional activity.	Methodology of scientific creation / Методология научного творчества Экономические аспекты природопользования Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов History and methology of ecology and natural resources management / История и методология экологии и природопользования Iternational collaboration / Международное сотрудничество Учебная практика / Educational practice	Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Environmental norms for sustainability / Экологические нормы для устойчивого развития Engineering ecology / Инженерная экология Monitoring of environmental impacts / Мониторинг экологических воздействий Производственная практика / Production practice Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice
SPC-6	Able to diagnose problems of nature conservation, develop practical recommendations for its protection and sustainable development	Management of natural resources / Менеджмент природных ресурсов Industrial nature management and economics / Промышленное природопользование и экономика Economic aspects of natural resources management / Экономические аспекты природопользования Wastes: Landfills, Processing and Recycling / Отходы: хранение, захоронение, рециклинг Surface water quality: modeling and	Environmental standards and nature management / Экологические стандарты и природопользование Modern remediation technologies / Современные технологии ремедиации Management of energy resources / Менеджмент ресурсов энергетики Environmental noms for sustainability / Экологические нормы для устойчивого развития Standards of environmental management and occupational safety / Стандарты экологического менеджмента и охраны труда Occupational safety and HSE-audit / Охрана труда и HSE-аудит

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
		management / Качество поверхностных вод: моделирование и менеджмент Учебная практика / Educational practice Научно-исследовательская работа / Research work	Environmental statistics / Экологическая статистика Environmental accounting and reporting / Экологический учет и отчетность Производственная практика / Production practice НИР / Research work Преддипломная практика / Pre-graduate practice

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

Workload of the course «Simulation and prevention of accidents» is 3 ECTS.

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

Вид учебной работы		**TOTAL**	**Semesters**			
			1	**2**	**3**	**4**
Contact academic hours		*17*			*17*	
Incl.:						
Lectures						
Lab work						
Seminars		17			17	
Self-study		*43*			*43*	
Evaluation and assessment		*12*			*12*	
Total workload	Ac.hours	**72**			**72**	
	ECTS	**2**			**2**	

5. COURSE CONTENTS

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

Name of the discipline section	**Content of the section (topics)**	**Type of academic activity***
Natural risks: types, sources	Natural disasters and their consequences	Seminars
Technogenic risks: sources, types	Technogenic disasters and their consequences	Seminars
Methodology of risk evaluation	Methodology of risk evaluation: regulations, estimation approaches	Seminars
Risk management approaches	Main principles of risk management for the regulation of natural and technogenic risks:	Seminars
Praxis of risk management	Practical examples of risk management approaches in branches of economy	Seminars

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Classroom for Academic Activity Type	CLASSROOM EQUIPMENT	Specialized learning, laboratory equipment, software and materials for the mastering the course
Seminars	Classroom, 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	-
Self-studies	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 an electronic information and educational environment.	-

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading:

1. Fuller T. P. (ed.). Global Occupational Safety and Health Management Handbook. – CRC Press, 2019.

Additional sources:

Asfahl, C. R., Rieske D. W., Asfahl C. R., Rieske D. W. Industrial Safety and Health Management. Великобритания: Prentice Hall, 2010.Alting L., Boothroyd G. Notes on Industrial Safety //Manufacturing Engineering Processes. – CRC Press, 2020. – С. 457-460.

Chemezov E. N. Industrial safety principles in coal mining //Записки Горного института. – 2019. – Т. 240. – С. 649-653.

Haupt T. C. Management of Safety, Health and Environment in South Africa: A Handbook. – Cambridge Scholars Publishing, 2021. URL: https://www.sciencedirect.com/science/article/pii/S092575352100182X

Soh Z. H. C. et al. Home and industrial safety IoT on LPG gas leakage detection and alert system //Int. J. Advance Soft Compu. Appl. – 2019. – Т. 11. – №. 1.

WORKING U. I. S. I. N. M., WELDING U. I. I. S. I. N., CUTTING G. A. S. OME553 INDUSTRIAL SAFETY ENGINEERING. URL: https://files.allabtengg.com/FilesUpload/Syllabus/2/4/16/12/3471/2021-02-09.05.15.46-OME553%20INDUSTRIAL%20SAFETY%20ENGINEERING.pdf

Internet-sources:

1. Electronic library system of the RUDN and third-party electronic library systems, to which university students have access on the basis of concluded contracts:

- electronic library system of the RUDN University http://lib.rudn.ru/MegaPro/Web
- electronic library system «Университетская библиотека онлайн» http://www.biblioclub.ru
- electronic library system Юрайт http://www.biblio-online.ru
- electronic library system «Консультант студента» www.studentlibrary.ru

- electronic library system «Лань» http://e.lanbook.com/
- electronic library system «Троицкий мост»

2. Databases and search engines:
- electronic fund of legal and regulatory and 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/
- ……..

*Educational and methodological materials for independent work of students during the development of the discipline/ module *:*

1. A course of lectures on the discipline "Simulation and prevention of accidents".

* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the discipline page in the Telecommunication educational and Information System!

8. MID-TERM ASSESSMENT AND EVALUATION TOOLKIT

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 "Simulation and prevention of accidents" 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).

DEVELOPER:

Professor of the Department of Environmental Safety and Product Quality Management		**Redina M.M.**
Position, Department	Signature	Name

HEAD OF THE DEPARTMENT:

Head of the Department of Environmental Safety and Product Quality Management		**Savenkova E.V.**
Department	Signature	Name

HAED OF THE HIGHER EDUCATION PROGRAM:

Professor of the Department of Environmental Safety and Product Quality Management		**Redina M.M.**
Position, Department	Signature	Name