Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
RUDN University

Academy of Engineering

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

COURSE SYLLABUS

History and methodology of subsoil use / История и методология недропользования

course title

Recommended by the Didactic Council for the Education Field of:

21.04.01 Oil and Gas Engineering

field of studies / speciality code and title

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

Oil and Gas Engineering / Технологии добычи и транспортировки нефти и газа

higher education programme profile/specialisation title

2026

1. COURSE GOAL(s)

The goal of the course "History and methodology of subsoil use / История и методология недропользования" is to familiarize students with the theoretical and applied foundations of subsoil use in Russia and abroad.

This course focuses on the fundamental principles, subject matter, methods, and history of the oil and gas industry; the legal status and powers of entities in the geological industry; the structure and content of legal relations in subsoil use; legislative and regulatory acts governing relations related to subsoil use; and the enforcement of international treaties and agreements.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The course "History and methodology of subsoil use / История и методология недропользования" is designed for students to acquire following competences (competences in part):

Table 2.1. List of competences that students acquire during the course

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-6	Able to identify and implement the priorities of their own activities and ways to improve them based on self-assessment	GC-6.1. Knows their resources and their limits (personal, situational, temporary, etc.), for the successful completion of the assigned work; the basics of planning the long-term goals of their own activities, taking into account the conditions, means, personal opportunities, stages of career growth, the time perspective for the activity development and the requirements of the labor market. GC-6.2. Can realize the intended goals of the activity, taking into account the conditions, means, personal capabilities, stages of career growth, time perspective for the development of activities and the requirements of the labor market; critically assess the efficiency of using time and other resources in solving the tasks, as well as regarding the result obtained. GC-6.3. Has the skills to determine an effective course of action in the field of professional activity; making decisions at the level of one's own professional activity; the skills in planning their own professional activities.
GPC-5	Able to evaluate the results of scientific and technical developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields	GPC-5.1. Knows the complex of modern technological processes and productions in the field of Oil and Gas Engineering; the modern innovative achievements and scientific research carried out at the present stage; methods and principles of systematization and generalization of the results of achievements in the oil and gas industry and related fields; main technologies for search, exploration and organization of oil and gas production in Russia and abroad, standards and specifications, sources of information, mass media and multimedia technologies.

Competence code	Competence descriptor	Competence formation indicators (within this course)
		GPC-5.2. Can consciously perceive information, independently search, extract, systematize, analyze and select information necessary for solving problems, organize, transform, store and transmit it; interpret the results of laboratory and technological studies in relation to specific conditions. GPC-5.3. Has the methods of collecting, processing and interpreting the information received, using modern information technologies and applied hardware and software, methods of protecting, storing and presenting information.
GPC-6	Able to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge	GPC-6.1. Knows the requirements of educational standards, the regulatory framework for organizing educational activities, the value bases of education and professional activities, the essence, structure, possibilities of using the educational environment to achieve personal, meta-subject and subject learning outcomes and ensure the quality of the educational subject being taught, safety requirements educational environment. GPC-6.2. Can communicate with the audience, to interest listeners, to independently plan educational work within the framework of the educational program in subjects based on his own developments. GPC-6.3. Has the skills of business communication, the basics of management in the organization of the work of the team in the performance of a certain research task.

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the variable component of (B1) block of the higher educational programme curriculum.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GC-6	Able to identify and implement the priorities of their own activities and ways to improve them based on self-assessment		Pre-graduation Practical Training; State Exam; Graduate Qualification Work
GPC-5	Able to evaluate the results of scientific and technical developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and		Geoinformation Systems and Applications; Research work (obtaining primary skills in research work); State Exam;

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	gas industry and related fields		Graduate Qualification Work
GPC-6	Able to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge		Research work (obtaining primary skills in research work); State Exam; Graduate Qualification Work

* To be filled in according to the competence matrix of the higher education programme

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "History and methodology of subsoil use / История и методология недропользования" is 3 credits.

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

Type of study work		TOTAL, acc.hrs.	Semester(s) 1
Contact academic hours, acc .		*36*	*36*
including:		18	18
Lectures			
Laboratory work			
Seminars (workshops/tutorials)		18	18
Self-study (ies), academic hours		*72*	*72*
Evaluation and assessment (exam or pass/fail grading)			
The course total workload	acc.hrs.	**108**	**108**
	Credits	**3**	**3**

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title		Course topic title		Course module contents (topics)	Academic activities types
1	History of Mining	1.1	Acquaintance with the history of the origin and development of the art and skills of mining by people from the moment of their origin to the present day, as well as progressive changes in equipment and technology.	1. Ancient times - IV millennium BC - primitive society 2. III–II millennia BC – the Early Metal Age 3. II millennium BC - IX century AD - ancient 4. IX–XVII centuries - Middle Ages 5. XVIII–XIX centuries – the formation of machine production 6. XX century. - progress in engineering and technology	LC, S

				7. First half of the XXI – AI and robotization and subsoil use	
2	History of the development of the oil and gas complex	2.1	The importance of energy resources for the country. Fuel and Energy Complex in the Structure of the Economy of the USSR and Russia. General overview of the state of the oil and gas industry in Russia.	1. Fuel and energy complex (FEC) is the basis of the economy: - Fuel and Energy Complex in the Structure of the USSR Economy; Fuel and Energy Complex in Modern Russia 2. Features of the oil and gas industry in Russia: - history of the structure of the fuel and energy complex: coal, oil, natural gas; - primary Russian energy resources and their role in the global energy sector; - the place and quality of energy in the country's commodity exports; - Fuel and Energy Complex is a Strategic Part of the Russian National Economy	LC, S
3	History of Oil and Gas Transportation and Storage	3.1	History of the development of methods of transportation and storage of oil and oil products. History of pipeline transport.	1. Historical stages of development of methods of transportation and storage of oil and oil products, as well as pipeline transport: - in ancient times and until the beginning of the XIX century; - during the period of technological progress, - during the period of oil production growth, - during the period of growth in the needs of the economy; 2. Oil transportation: in ancient times; the first pipelines; pipelines of Ancient Rome, Ancient India, Ancient China, Russia in the XII century	LC, S
4	History of the development of the main oil	4.1	Main fields and indicators of oil and gas production in Russia.	1. Main fields: history, development, production indicators depending on the region and type of hydrocarbons:	LC, S

	and gas fields			1.1. Samotlorskoye (Khanty-Mansiysk Autonomous Okrug, Khanty-Mansiysk Autonomous Okrug); Priobskoye (Khanty-Mansi Autonomous Okrug); Romashkinskoye (Republic of Tatarstan); Lyantorskoye (Surgut district of the Khanty-Mansi Autonomous Okrug); Vostochno-Messoyakhskoye (Yamalo-Nenets Autonomous Okrug). 1.2. Urengoy (Yamalo-Nenets Autonomous Okrug, Yamal-Nenets Autonomous Okrug); Yamburgskoye (Yamal-Nenets Autonomous Okrug); Bovanenkovskoye (Yamal); Zapolyarnoye (Yamal-Nenets Autonomous Okrug); Kovyktinskoye (Irkutsk Region); Shtokman (Barents Sea shelf); Astrakhan	
5	Subsoil Use Methodology	5.1	The essence and feature of the methodology. Evolution of approaches to the study of subsoil use. The place of scientific knowledge about subsoil use in the classification of sciences. Levels of scientific knowledge of subsoil use.	1. Methodology of subsoil use as a doctrine of the principles of construction, forms and methods of scientific cognition. 2. Methods, means and techniques for obtaining objective knowledge about the processes related to the use of mineral resources. 3. Features of subsoil use methodology: modeling, system approach, taking into account transient processes and their patterns in the development of technologies for evaluation, mining and ore preparation. 4. The evolution of approaches to the study of subsoil use reflects changes in technologies, economic conditions and	LC, S

				scientific priorities (by stages of development). 5. The place of scientific knowledge about subsoil use in the classification and system of integration of natural (geology, geophysics), technical and economic sciences: empirical level; theoretical level; experimental and theoretical level: modeling, analysis and synthesis, induction and deduction, hypothetical method, historical and logical approaches; methods of system analysis, synergetic approach, method of analogies and expert assessments, calculation and analytical methods. 6. Principles of methodology for forecasting, prospecting and exploration of minerals: construction of volumetric geological and economic models; sequential approximation; the principle of analogy; the principle of complexity and completeness of research; the principle of minimizing the cost of money and time.	

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	**Classroom equipment**	**Specialised educational / laboratory equipment, software, and materials for course study** (if necessary)
Lecture	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations.	
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised	

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	furniture and technical means for multimedia presentations.	
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

Vorob'ev A. E., Sinchenko A.V. Istoriya neftegazovogo dela v Rossii i za rubezhom [History of oil and gas business in Russia and abroad]. text data. Moscow: Peoples ' Friendship University of Russia, 2013, 140 p—

2. Karpov V. P. Course of history of the domestic oil and gas industry : training manual. [Electronic resource]: textbook. manual / V. P. Karpov, N. Yu. Gavrilova. - Electron. dan. — Tyumen : TyuMGNUPubl., 2011, 254 p. (in Russian)
3. Ahrens, V. J. Fundamentals of mining science methodology : training manual / V. Zh.Arens, Moscow : Moscow State Mining University, 2003, 226 p. [Electronic resource]. - URL: //biblioclub.ru/index.php?page=book&id=79370
4. Kutuzov B. N. Istoriya gornogo i vzryvnogo dela : uchebnik [History of mining and blasting]. - Moscow : Moscow State Mining University, 2008, 428 p. [Electronic resource]. - URL: //biblioclub.ru/index.php?page=book&id=99658

Additional(optional) reading (sources):

1. Sergeeva Z. Kh. Uglevodnaya tsivilizatsiya mezhdu proshlem i budushchem [Hydrocarbon civilization between the past and the future]: neft i razvitie v XX-XXI vv [Oil and development in the XX-XXI centuries]. — Kazan : Kazan National Research Technological University, 2012. — 196 p. (in Russian)
2. Oil and gas industry of Russia: Textbook / Yu. D. Zemenkov et al. - Omsk: OmSTU PublishingHouse, 2001. - 84 p.
3. Mstislavskaya L. P. Neftegazovoe proizvodstvo (Voprosy, problemy, resheniya): Uchebnoe posobie [Oil and gas production (Voprosy, problemy, resheniya)].
4. Kopytov A. I., Yu. A. Istoriya gornogo dela [History of mining].Masaev, V. V. Pershin. Edited by V. V. Pershin; Akadem. gorn. nauk, Sib. Novosibirsk, 2009, 511 p. (in Russian)
5. Mining industry of Russia and the USSR in the first quarter of the XX century: A textbook for universitiesE.M. Sukhanova. - Moscow : Mining Book; MGSU Publishing House, 2009. - 600 p. - (History of Mining, Vol. 1).

Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) http://lib.rudn.ru/MegaPro/Web

- EL "University Library Online" http://www.biblioclub.ru
- EL "Yurayt" http://www.biblio-online.ru
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" http://e.lanbook.com/

2.Databases and search engines:

- electronic foundation of legal and normative-technical documentation http://docs.cntd.ru/
- Yandex search engine https:// www .yandex.ru/
- Google search engine https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

*Training toolkit for self- studies to master the course *:*

1. The set of lectures on the course History and methodology of subsoil use / История и методология недропользования.

2. Guidelines for students on the development of the course History and methodology of subsoil use / История и методология недропользования.

*The training toolkit and guidelines for the course are placed on the course page in the university telecommunication training and information system under the set procedure.

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