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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE
LUMUMBA
RUDN University**

ENGINEERING ACADEMY

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

COURSE SYLLABUS

Geology, prospecting, exploration and exploitation of oil and gas fields

(course title)

Recommended by the Didactic Council for the Education Field of:

1.6.11. Geology, prospecting, exploration and exploitation of oil and gas fields

(field of studies / speciality code and title)

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

Geology, prospecting, exploration and exploitation of oil and gas fields

(higher education programme profile/specialisation title)

1. PURPOSE OF THE DISCIPLINE

The purpose of mastering the discipline "Geology, prospecting, exploration and exploitation of oil and gas fields." is to prepare for surrender candidate exams, and same the acquisition of knowledge, skills and experience in the research field, characterizing the stages of the formation of competencies and ensuring the achievement of the planned results of the development of the educational program.

The main objectives of the discipline are to provide graduate students with knowledge of the theoretical bases of oil and gas prospecting and exploration, as well as practical skills in substantiating the most promising areas for laying new prospecting and exploration wells, setting up additional seismic and other types of work on the study of the geological structure of the study area of subsoil.

2. REQUIREMENTS FOR THE RESULTS OF THE DISCIPLINE

Mastering the discipline "Geology, prospecting, exploration and exploitation of oil and gas fields. " is aimed at preparing for the candidate's examinations, as well as mastering the following competencies:

- know the conditions of formation of mineral deposits
- be able on the basis of geological, geophysical and geochemical methods to forecast and assess the prospects of their industrial development
- perform geological and economic evaluation of deposits, using the methods of mathematical modelling
- be able to read and draw structural maps and geological sections, calculate and analyze basic geostatistical data, describe oil and gas deposits geologically correctly, analyze oilfield data, data of exploratory drilling and downhole geophysics
- master the skills of working with spreadsheets, text and graphics editors, skills of geological engineering graphics design (maps, sections).

3. SCOPE OF THE DISCIPLINE AND TYPES OF STUDY

The total workload of the discipline "Geology, prospecting, exploration and exploitation of oil and gas fields." is 3 credits.

Type of study		TOTAL, ac. h.	Course 2
<i>Contact work, ac.h.</i>		60	60
including:			
Lectures (LC)		30	30
Practical/seminar classes (SP)		30	30
<i>Independent work of students, ac.h.</i>		48	48
<i>Control (credit with grading), ac.h.</i>		36	36
Total time commitment of the discipline	ac.h.	108	108
	credits	3	3

4. CONTENT OF THE DISCIPLINE

Name of discipline section	Section (topic) content	Type of study
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Name of discipline section	Section (topic) content	Type of study
Section 1: Fundamentals of oil and gas prospecting and exploration	Topic 1.1. Introduction. History of the theoretical foundations of oil and gas prospecting and exploration Topic 1.2. The role of Russian and foreign geologists in developing the theoretical foundations of oil and gas prospecting and exploration Topic 1.3. Development of the oil and gas industry. The prospects of the oil and gas industry and geology.	LC, SP
Section 2: Methods of oil and gas prospecting and exploration.	Topic 2.1. Global patterns of oil and gas field location. Topic 2.2. Global patterns of reservoir distribution by reserves, depth, stratigraphic complexes, and major geostructural elements. Topic 2.3. Phase zoning of hydrocarbon distribution.	LC, SP
Section 3: Geological factors controlling the formation and location of hydrocarbon accumulations.	Topic 3.1. Stratigraphic criteria controlling hydrocarbon accumulations. Topic 3.2. Tectonic criteria controlling hydrocarbon accumulations. Topic 3.3. Lithologic and paleogeographic criteria of oil and gas content	LC, SP
Section 4. Geochemical criteria of oil and gas bearing capacity	Topic 4.1. Processes of reservoir formation, generation, migration and accumulation Topic 4.2. Organic matter, its transformation. Biomarkers Topic 4.3. Inorganic origin of hydrocarbons. Sources, migration, localization	LC, SP
Section 5: Stages of Oil and Gas Exploration	Topic 5.1. Geological mapping and geological exploration Topic 5.2. Prospecting works. Objects of regional forecasting. Prediction maps Topic 5.3. Complexes of geological, geophysical and geochemical methods	LC, SP
Section 6: Search and Evaluation of Oil and Gas Fields	Topic 6.1. Remote prospecting methods. Reference and parametric drilling. Transects . Topic 6.2. Traps and their prediction based on a set of geological and geophysical features. Physical and geological models of oil and gas deposits. Topic 6.3. Forecast resources and their classification. The purpose and methods of calculating predicted resources	LC, SP
Section 7: Oil and Gas Exploration	Topic 7.1. Exploration sub-stages. The purpose of exploration and categories of hydrocarbon reserves. Topic 7.2. Additional in-mine exploration. Pilot operation. Role of geologists and geophysicists.	LC, SP
Section 8. Geological and geophysical methods of	Topic 8.1. Logging methods (GIS) Topic 8.2. Vertical seismic profiling	LC, SP

Name of discipline section	Section (topic) content	Type of study
control over oil and gas field development	Topic 8.3 Nuclear Magnetic Resonance methods	

5. LOGISTICS OF THE DISCIPLINE

Type of audience	Classroom equipment	Specialised training/laboratory equipment, software and materials for the discipline (if necessary)
Lecture room	Audience for holding classes lecture type, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentation	Projector, screen, chalkboard, computer
Seminar room	Auditorium for seminars, group and individual consultations, current monitoring and interim certification, equipped with a set of specialized furniture and technical means of multimedia presentations.	specialized laboratory equipment, installations, test benches, etc.
Computer room	Computer room for classes, group and individual consultations, current monitoring and interim certification, equipped with personal computers (10 pcs.), blackboard (screen) and technical means of multimedia presentations.	MS Office, Petrel, ArcGis, QGIS software
For independent work of students	An auditorium for students' independent work (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the EIOS.	Projector, screen, chalkboard, computer

6. TRAINING, METHODOLOGICAL AND INFORMATION SUPPORT FOR THE DISCIPLINE

Basic literature:

1. Bakirova A.A., Gabrielyants G.A. et al. Theoretical bases of oil and gas prospecting and exploration. In 2 books. Book 1: Theoretical bases of forecasting oil and gas subsurface.
2. Bakirova AA, Gabrielyants GA et al. Theoretical bases of oil and gas prospecting and exploration. In 2 books. Book 2: Methods of Search and Exploration of Oil and Gas.
3. Mstislavskaya LP, Filippov VP Geology, Prospecting and Exploration of Oil and Gas / Text / : Study Guide for University Students. Gubkin Russian State University of Oil and Gas. - Moscow: CenterLitNefteGas, 2005. - 200c.

Further reading:

1. Bakirova A.A., Bakirov E.A. et al. Theoretical Foundations and Methods of Prospecting and Exploration of Oil and Gas Accumulations.-M.: High School, 1976.- 500 p. and 3rd edition revised and ext. 1987.- 384 p. 2. Nesterov I.I., Vasilyev V.B. Theory and practice of oil and gas exploration: Textbook for universities. - M.: Nedra, 1993. - 330p.

Resources of the information and telecommunication network "Internet":

1. the RUDN electronic library system and third-party electronic libraries to which university students have access on the basis of contracts:
 - RUDN Electronic Library System - RUDN EBS <http://lib.rudn.ru/MegaPro/Web>
 - The University Library Online electronic library system <http://www.biblioclub.ru>
 - The Yurite electronic library system <http://www.biblio-online.ru>

- Student Consultant electronic library system www.studentlibrary.ru

- Lan LGS <http://e.lanbook.com/>

- Trinity Bridge

2. databases and search engines:

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

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

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

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

Teaching materials for students' independent work while mastering the discipline/module:

1. Course of lectures on the discipline "Geology, prospecting, exploration and exploitation of oil and gas fields ".

7. ASSESSMENT MATERIALS AND SCORING SYSTEM FOR ASSESSING THE LEVEL OF COMPETENCE IN THE DISCIPLINE

The assessment materials and grading system for the discipline are presented in the Appendix to this Work Programme of the discipline.

DEVELOPERS:

Assistant Professor of the Department of
Subsoil Use and Oil and Gas

Position, BD

V.Yu.Abramov

Signed

Name and surname

THE HEAD OF THE BUP:

Head of the Department of Subsoil Use
and Oil and Gas

Position, BD

A.E. Kotelnikov

Signed

Name and surname